Food Protection Manager Certification
(QFO, CSFM, CPFS, CMFS)

Course Manual 2020

Prepared from the 2017 FDA MODEL FOOD CODE

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This manual is not intended to replace any textbook associated with any ANSI accredited FPMC exam. It should be used as a refresher for those preparing for re-certification or as a supplement to additional study materials or other form of study for those who are certifying for the first time.
Please note that the glossary has been placed in the front of the guide, rather than in the back which is customarily done. The editor chose to do this because he felt that for those who are somewhat new to the industry it is very important that you familiarize yourself with the terms, phrases and nomenclature of the industry. It is also a good review for those with industry experience. Pay close attention to the red colored words and terms.

**Abrasive Cleaners:** Cleaners containing a scouring agent used to scrub off hard to remove soils. They may scratch some surfaces.

**Acidity:** The level of acid in a food. An acidic substance has a pH below 7.0. Foodborne microorganisms typically do not grow in highly acidic food, while they best in food with a neutral to slightly acidic pH.

**Acidification:** Raising the acid level in a food to help slow bacterial growth.

**Active managerial control:** Food safety management system is designed to prevent foodborne illness by addressing the five most common risk factors identified by the Centers for Disease Control and Prevention (CDC).

**Adulterants:** Something added to a food to make it unsafe.

**Air gap:** Air space used to separate a water supply outlet from any potentially contaminated source. The air space between the floor drain and the drainpipe of a sink is an example. An air gap is the only completely reliable method for preventing backflow.

**Aseptically packaged food:** Food that has been sealed under sterile conditions, after UHT pasteurization. UHT = ultra-high temperature. The product is shelf-stable.

**Backflow:** Unwanted reverse flow of contaminated water through a cross connection into a potable (drinking) water system. It occurs when the pressure in the potable water supply drops below the pressure of the contaminated supply.

**Bacteria:** Single celled, living microorganisms that can spoil food and cause foodborne illness. Bacteria present in food can quickly multiply to dangerous levels, when food is improperly cooked, held or reheated. Some form spores that can survive freezing and very high temperatures.

**Batch Out:** Using a number of smaller pots to assist in cooling food.

**Biological Hazards:** Illness causing microorganisms that can contaminate food, such as certain bacteria, viruses, parasites, and fungi, as well as toxins found in certain plants, mushrooms, and seafood.
**Biological toxins**: Poisons produced by pathogens, plants, or animals. They can also occur in animals as a result of their diet.

**Carriers**: People who carry pathogens and infect others, yet may never become ill themselves.

**Ciguatera poisoning**: Illness that occurs when a person eats fish that has consumed the ciguatera toxin. This toxin occurs in certain predatory tropical reef fish, such as amberjack, barracuda, grouper and snapper.

**Cold holding equipment**: Equipment specifically designed to hold cold food at an internal temperature of 41 ° Fahrenheit (5 ° Celsius) or lower.

**Condiments**: Assorted foods used to compliment main dishes.

**Contamination**: Presence of harmful substances in food. Some food safety hazards occur naturally, while others are introduced by humans or the environment.

**Corrective action**: Predetermined step taken when food does not meet a critical limit.

**Coving**: Curved, sealed edge placed between the floor and wall to eliminate sharp corners or gaps that be impossible to clean. Coving also eliminates hiding places for pests and prevents moisture from deteriorating walls.

**Chafing Dish**: Assorted sizes and shapes for keeping food hot on a buffet. It can be fueled by electricity but usually by gel fuel.

**Cross connection**: Physical link through which contaminants from drains, sewers, or other wastewater sources can enter a potable water supply. A hose connected to a faucet and submerged in a mop bucket is an example.

**Cross contact**: The transfer of an allergen from a food containing an allergen to a food that does not contain an allergen.

**Cross contamination**: Occurs when pathogenic microorganisms are transferred from one food or surface to another.

**Defrosting**: The process used to thaw frozen foods.

**Exclusion**: Prohibiting foodhandlers from working in the establishment due to specific medical conditions.

**FAT TOM**: Acronym for the conditions need by most foodborne microorganisms to grow: food, acidity, temperature, time oxygen, moisture.

**FDA food code**: Science based reference for retail food establishments on how to prevent foodborne illness. These recommendations are issued by the FDA to assist state health departments in developing regulations for foodservice inspection program.

**Flow of food**: Path food takes through establishment from purchasing and receiving through storing, preparing, cooking, holding, cooling, reheating and serving.
**Food allergy**: The body’s negative reaction to a particular food protein.

**Food safety management system**: Group of programs, policies and SOP’s designed to prevent foodborne illness by actively controlling risks and hazards throughout the **flow of food**.

**Histamine**: Biological toxin associated with temperature abused histamine infected fish which causes Scombroid poisoning.

**Host**: Person, animal, or plant on which another organism lives and from which it takes nourishment.

**Hot holding equipment**: Equipment such as chafing dishes, steam tables, and heated cabinets specifically designed to hold at an internal temperature of 135 ° Fahrenheit (57 ° Celsius) or higher.

**Hotel Pan**: A 12” x 20” stainless or aluminum pan with varying depths. It is used as a storage pan for food stuff and is the food pan in a chafing dish.

**Immune system**: The body’s defense system against illness. People with compromised immune systems are more susceptible to foodborne illnesses

**Job Aides**: Posters that are used to remind staff about different responsibilities on the job.

**Jurisdiction**: Is a town, city or state who oversees food safety in a particular region.

**Master cleaning schedule**: Detailed scheduling listing all cleaning tasks in an establishment, when and how they are performed, and who will perform them.

**Safety Data Sheets (SDS)**: Sheets supplied by the chemical manufacturer listing the chemical and its common names, its potential physical and health hazards, information about using and handling it safely, and other important information. OSHA requires employers to store these sheets so that they are accessible to employees.

**Microorganisms**: Small, living organisms that can be seen only with the aid of a microscope. There are four types of microorganisms that can contaminate food and cause foodborne illnesses: **bacteria, viruses, parasites and fungi**.

**National Safety Foundation (NSF)**: Organization that develops and publishes standards for sanitary equipment design. It also assesses and certifies that equipment has met these standards. Restaurants and food service managers should look for an NSF international mark (or UL EPH product mark) on commercial food service equipment.

**Occupational Health and Safety Administration (OSHA)**: Federal agency that regulates and monitors workplace safety.

**Pathogens**: a bacterium, virus, or other microorganism that can cause disease.
**Potable water**: Water that is safe to drink.

**Pre-Requisites**: Something that is required as a prior condition for something else to happen or exist.

**Ready to eat food**: Any food that is edible without further preparation, washing, or cooking. It includes washed fruit and vegetables, both whole and cut; deli meats; and bakery items. Sugars, spices, seasoning, and properly cooked food items are also considered ready to eat.

**Restriction**: Prohibiting food handlers from working with or around food, food equipment, and utensils.

**Risk Factor**: Defined by the CDC as potentially dangerous situations that impact food safety.

**Sanitizing**: Process of reducing the number of microorganisms on a clean surface to safe levels.

**Scombroid poisoning**: Illness that occurs when a person eats a Histamine infected fish that has been time temperature abused. Scombroid fish includes tuna, mackerel, blue fish, skipjack, and bonito.

**Service sink (Mop sink)**: Sink used exclusively for cleaning mops and disposing of waste water. At least one service sink or one curbed drain area (Floor sink) is required in an establishment.

**Shallow Out**: Using 2” pans to help cool food quickly.

**Shell stock identification tags**: Each container of live, mollusk shell fish received must have an id tag that must remain attached to the container until all the shellfish have been used. Tags are to be kept on file for 90 days starting from the last day of procession.

**TCS food**: Food that contains moisture and protein and has a neutral or slightly acidic pH. Such food requires time temperature control to prevent the growth of microorganisms and the production of toxins.

**Temperature danger zone**: The temperature range between 41 and 135 ° Fahrenheit (5 and 57 ° Celsius), within which most foodborne microorganism rapidly grow.

**Thawing**: Is the process of letting frozen foods defrost safely.

**Time temperature abuse**: Food has been time temperature abused anytime it has been allowed to remain too long at a temperature favorable to the growth of foodborne organisms.

**Toxic metal poisoning**: Illness caused when toxic metals are leached from utensils or equipment containing them.

**Toxins**: Poisons produced by pathogens, plants, or animals. Some occur in animals as a result of their diet.

**Vacuum breaker**: Device preventing the backflow of contaminants into a potable water system.

**Variance**: Document issued by a regulatory agency that allows a requirement to be waived or modify
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CHAPTER 1
INTRODUCTION TO FOOD SAFETY
Why You Are Taking This Class and/or exam?

Each year in the United States, 48 million people contract a food borne illness. 128 thousand have to be hospitalized and approximately 3 thousand people will diedue to their illness.

Because of the above conditions, it became apparent in the early 1900’s that the government had to have control over those industries that provided food to the overall population. New agencies were created and new laws were enacted. Today the food service industry is overseen by the following agencies and departments, understanding their role are important so we may better understand their rules and regulations.

Additional Reasons for Taking the Course

• If you’re particular jurisdiction does not require the certification, but your operation has been cited several times for violations of the local food code; you may, as part of your compliance, be required to take and pass a certification course.
• Your jurisdiction requires that one or more individuals employed in the operation have and maintain current certification.
• Your jurisdiction requires that your certification be renewed every three or five years. Depending upon their requirements, you may have to take the class, class and exam or just the exam.
• Your company policy requires that particular positions in their operation be certified. For example; all management personnel, all line cook positions and up or all department heads

Achieving the Required Level of Food Safety Knowledge

Over forty years ago, the Council for Food Protection was created. This council sets the standards for the “Food Protection Managers Certification” This certification requires an individual to take an accredited examination in order to “demonstrate knowledge of food safety”. The American National Standards Institute (ANSI) was contracted; they oversee all exams that want to be accepted for this certification. All six ANSI exams are equal, but not necessarily in the eyes of a particular jurisdiction, or a certain business. Individuals should verify with their company policy and/or the local jurisdiction as to the acceptance of the exam you will be taking.

The FDA incorporated the Conference standards into its Model Food Code; they are now requiring that all retail operation have a certified FPM on site whenever the business is operating.

The FDA Model Food Code also establishes five key public health interventions to protect consumer health:

1 Employee health controls, 2 Time and temperature parameters for controlling pathogens3Consumer Advisories4 Demonstration of knowledge 5 Controlling hands as a vehicle of contamination
IMPORTANT GOVERNMENT AGENCIES INVOLVED IN FOOD SAFETY

The Food and Drug Administration writes the “Model Food Code”, a reference guide for all 50 states to use when preparing rules and regulations regarding the public and food safety. It is based on ongoing scientific research and is updated on a continuing basis, making it necessary for the states to change their rules and regulations from time to time. The Model Food Code now requires that in order to ensure food safety, all retail food establishments have a **certified food protection manager on site at all times that the operation is open.** *It is important to remember that the FDA Model Food Code are just recommendations to the 50 states. Each state has to adopt in part or whole.*

It also oversees other agencies who oversee that all food is grown, processed, transported, delivered, prepared and served safely to all consumers.

**UNITED STATES DEPARTMENT OF AGRICULTURE:**

Is a federal agency that is charged with overseeing the meat, poultry (including eggs) and dairy industries nationwide. It has jurisdiction anytime these products cross state lines. If a product stays within the state boundaries the state department of agriculture will have jurisdiction.

**THE CENTER FOR DISEASE CONTROL:**

Located in Atlanta Georgia this agency collects data from all of the health departments located throughout the U.S and abroad. Using the latest software, they are able to traceback where an outbreak started. They also keep track of new emerging pathogens.

**The State Health Departments**

After each state studies the new Model Food Code, the state health department will ask for a bill to be introduced to the state legislature to change particular rules and regulations. This can take quite a while to happen, but when it does the new rules and regulations take effect in that state. This is why food safety regulations can vary from one state to another.

**The Local Jurisdiction (Your Health Department)**

Depending on the state you work in, it is possible that your operation will be inspected by the state health department, the county health department or your city’s health department.
Introduction to Food Safety

How Safe Is The Food We Serve?

The vast majority of our food supply is safe. It is free of pathogens and other adulterants

Each year in the United States 48 Million people contract a food borne illness (half of those contract Norovirus), 128 thousand need to be hospitalized and approximately 3 thousand people die each year from a food related illness and/or incident.

Then why do we have to bother with this class?
Because of the small amount of unsafe product that can and does get into our supply we in the foodservice industry must be diligent. We have to assume that any of the products we use are unsafe and must be handled in a manner that prohibits, eliminates or reduces the risk to consumer

Challenges to Food Safety
- Language and culture
- Literacy and education
- Pathogens
- Unapproved suppliers
- High-risk customers
- Staff turnover
Understanding the Flow of Food: There are nine steps in the flow of Food each step if not executed properly and/or safely can cause food product to become unsafe. Take note that some food items do not necessarily have to travel through all nine steps; for example, bananas, we buy, receive then serve, only three steps. The less steps the less something bad can happen. It is also very important to understand the relationship of the flow of food and the other aspects of food safety. They are very closely related and understanding the flow of food can help you to understand food safety in general.

1. **Purchasing**: Make sure that you purchase all food products from reputable suppliers who follow local, state and federal guidelines.
2. **Receiving**: Deliveries should arrive at appropriate times agreed to. Check items for correct temperatures and that the quantity, quality and price agree with the order sheet, store all items in their proper locations immediately. Items that have been recalled from a previous delivery if requested to hold for pick up should have been stored separately from other products, clearly secured and marked for RETURN ONLY, and be picked up with a receipt for pick up.
3. **Storing**: All items stored in their proper locations using first in-first out (FIFO) system. Storage areas should meet all required specs for temperature, ventilation, humidity and lighting. Lighting refers to the density of light measured in foot candles or lux. Always make sure the right bulb is in place so that whatever the job required in that area it can be done properly and safely, for example when or wherever food is being prepped it needs to have adequate lighting so the food is prepared safely. Where as in a dry storage area less illumination. Maintain the
bulbs replacing them as they burn out. Ventilation is important as it replaces smoky, dirty air with fresh clean air and makes for a better working environment.

The remaining steps in the Flow of Food will be defined more as we go through the course. Keep in mind the important relationship with the Flow of Food and Food Safety. Look for the FLOW OF FOOD in caps and bold.
Test your knowledge

Chapter #1

Column #1 are the questions. Choose the correct answer from the choices in column #2 and write the letter in the corresponding box in column #3.

Please note, some answers are used more than once and some are not used. The answer key is located below the questions and answers upside down.

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<td>Process in which food product travels from farm to fork</td>
<td>A Food and Drug Administration (FDA)</td>
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<td><strong>2</strong></td>
<td>Tracks food borne outbreaks nationwide</td>
<td>B Flow of Food</td>
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<td><strong>3</strong></td>
<td>Oversees the dairy, meat and poultry industries</td>
<td>C Norovirus</td>
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<td><strong>4</strong></td>
<td>Now recommends a holder of the Food Protection Managers Certificate be present during all operational hours</td>
<td>D Language and culture</td>
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<td><strong>5</strong></td>
<td>The cause of 50% of all food borne illnesses each year</td>
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<td>Recommends new and/or updated food safety regulations</td>
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<td><strong>8</strong></td>
<td>Issues permits and licenses to retail foodservice establishments</td>
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<td><strong>9</strong></td>
<td>Agency that adopts the FDA food code for use in their own jurisdiction</td>
<td>I Hepatitis A</td>
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<td><strong>10</strong></td>
<td>Federal agency which has jurisdiction of interstate egg business</td>
<td>J The STATE Assembly</td>
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Answer key

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CHAPTER 2
FOOD SAFETY HAZARDS
Hazards/Contaminants are the presence of harmful substances in food. Some food safety hazards/contaminants occur naturally, while others are introduced by humans or the environment. The three types of hazards are:

1. **Chemical Hazards** like food service chemicals (soaps, sanitizers, degreasers, or metals like zinc, copper & lead found in pots and pans, etc.)
2. **Physical Hazards** like broken fingernails, staples, and band aids that accidentally get into food during the Flow of Food.
3. **Biological Hazards** like Bacteria, Viruses, Parasites, Fungi and Toxins. These Biological Hazards (contaminants) are very, very small and hard to detect. We refer to them as Pathogenic Microorganisms; because unlike some microorganisms that just spoil food, these microorganisms can make people ill or kill them.

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Food can be contaminated when objects get into it. It can also happen when natural objects are left in food; bones in a fish filet which could lead to choking.

Physical Hazards are a constant problem. They can become a problem when you least expect it, so diligence is needed to avoid problems. Some basic policies should be incorporated to help prevent people being injured or worse.
CHEMICAL HAZARDS

Many people have gotten sick after consuming food and beverages contaminated with foodservice chemicals. To keep food safe, follow these guidelines. Foodservice chemicals (cleaners, sanitizers, polishes, machine lubricants and pesticides) must be used carefully and stored properly.

- Purchase chemicals from approved, reputable suppliers.
- Store chemicals away from prep areas, food storage areas and service areas.
- Use chemicals for their intended use and follow manufacturer’s directions.
- Only handle food with equipment and utensils approved for foodservice use.
- Make sure the manufacturer’s labels on original chemical containers are readable.
- Keep SDS current, and make sure they are accessible to staff at all times. (Safety Data Sheets which are required by OSHA- Occupational Safety Hazard Administration)
- Follow the manufacturer’s directions and local regulatory requirements when disposing of chemicals.
- When transferring chemicals to additional containers (bottles) make sure the bottles are labeled properly.
- Check to see that soda dispensing systems do not have copper tubing that can backflow into the system and cause cooper poisoning.
- Avoid use of toxic metals, copper, zinc and lead found in pots and pans.  
  *If acidic food is cooked in these containers you risk TOXIC METAL POISONING*
- Never use used chemical buckets to store food product.

MSDS SHEETS / OSHA

Safety Data Sheets (SDS) are informational sheets about chemicals in the workplace. The Occupational Safety Health Administration (OSHA), a federal agency that oversees workplace safety requires that these sheets be kept on file so employees who work with a particular chemical can read all about them. According to the regulation employees have a right to know what chemicals they are working with and what are the possible dangers.
Microorganisms are small living single cell organisms that can be seen only with the aid of a microscope. When the conditions are right, microorganisms start to multiply. On average they will double every 20 minutes. It is this multiplication to unsafe levels that causes people to become ill. It is our responsibility as food service professionals to help make sure this does not happen.

Food Safety Hazards

Cell Growth Diagram

- Microorganisms are made up of cells (many, many) of them. Cells are living entities.
- Cells are so small you need a microscope. 17,000 cells can fit on the face of a dime.
- If conditions are right cells double every 20 minutes.
- Depending upon a particular pathogen (e-coli, salmonella, norovirus, etc.) the number of cells needed to make a person sick on average is in the thousands.

10 hours growth = > 1 Billion cells!

TOXINS

In addition to microorganisms, Toxins are also Biological Hazards (Contaminants). Toxins are Poisons produced by pathogens, plants, or animals. Some occur in animals as a result of their diet.

Remember; both microorganisms and toxins are biological contaminants; the difference is that microorganisms are living cells while toxins are poisons.
Biological Pathogens

BACTERIA: Biological Hazard/Contaminates

Shiga Toxin E-Coli –
- Commonly found in cattle intestines then transferred (from their stool) to other parts of their carcasses when being slaughtered and prepared for market (usually in ground meats).
- Also found in fresh produce (leafy greens) that have been contaminated by animal droppings and or irrigated with contaminated water.
- Prevention; Purchase from approved vendors. Cook ground meats to 155 degrees internally and wash produce properly.

Shigella –
- Commonly spread by people who have not washed their hands properly after using the toilet and then prepping food.
- Ready to eat salads like, potato, egg, macaroni, chicken, etc. are common sources of Shigella.
- Also flies in an operation can transfer the bacteria. In addition, food that has made contact with contaminated water such as produce. As few as 10 cells of Shigella can make a person sick.
- Prevention; Frequent and proper hand washing, restricting use of bare hand contact and proper use of single use disposable gloves. Control flies inside and outside of the operation.

Salmonella Typhi –
- Linked to contaminated water supply. Caused by flooding and the mixing of safe water supplies with sewage treatment, or when a well gets compromised.
- Causes Typhoid Fever and Cholera. It is associated with beverages and ready to eat foods.

Non Typhoidal Salmonella
- Another salmonella linked to farm animals that causes salmonellosis that is predominantly found in poultry
- May also be found in eggs, meat, dairy products and some produce
- Prevention- cook poultry and eggs to minimum internal temperature prevent cross contamination between poultry and ready to eat foods.

Bacteria pathogens are controlled by eliminating one or more of FATTOM conditions. Examples of this include, vacuum packing food to eliminate oxygen, acidification of food to raise the pH level, drying food to eliminate moisture and most important controlling time and temperature (Refrigerating /freezing)
**FATTOM:**
Acronym for the conditions needed by bacteria to multiply:

- **FOOD**
- **ACIDITY**
- **TEMPERATURE**
- **TIME**
- **OXYGEN**
- **MOISTURE**

**FOOD:** Typically, foods that are proteins or carbohydrates (see TCS chart page 18)

**ACIDITY:** The level of acid in a food based on a scale of 0__________4.6_________7_________7.5___________14

0 is highly acidic like vinegar and 14 are very alkaline like flour.

Bacteria microorganisms multiply best when the acidic level of a food is between 4.6 and 7.5

**TEMPERATURE:** (DANGER ZONE): Keeping hot food at 135 degrees or higher and cold food at 41 degrees or lower greatly reduces the growth of harmful microorganisms.

*The range of temperature between 135 and 41 is referred to as the TEMPERATURE DANGER ZONE.*

**TIME:** Food that is left in the Temperature Danger Zone for extended periods of time may experience pathogenic growth based on how long and at what temperature. Between **70 -125 degrees** microorganisms multiply even faster.

**OXYGEN:** Many pathogens need oxygen in order to multiply, while some do not need oxygen. These we call anaerobic microorganisms. The most well known anaerobic is Botulism.

**MOISTURE:** In order for foods to support pathogenic growth they must also contain moisture (water activity aw). This refers to water that is a natural part of the food and not external water.

When all of the above FATTOM conditions are present, bacteria cells begin to multiply. We can alter this by addressing one or more of these conditions; keep food out of the danger zone, change the acidification level of a product, use dry processing to alter the water activity, or use reduce oxygen packaging (ROP), like vacuum packing to eliminate oxygen.
FOODS TIME TEMPERATURE CONTROLLED FOR SAFETY (TCS FOODS)

Food that contains moisture and protein, and has a neutral or slightly acidic pH, (4.6-7.5) requires TIME & TEMPERATURE control to prevent the growth (multiplication) of bacteria. These are the categories of foods that are more likely to be affected by TIME TEMPERATURE ABUSE, leaving these foods in the temperature danger zone for extended periods of time.

Some frequently asked questions about TCS foods......

Q. Why a cooked baked potato and not a raw potato?
A. It has to do with the fact that potatoes originate from soil which contains many pathogens. Some pathogens have the ability to hibernate until FATTOM conditions are just right. This usually happens when potatoes are precooked and then left at room temperature (the Temperature Danger Zone). During this period the pathogens have the right FATTOM conditions and can multiply to unsafe levels.

Q. Why diced tomatoes and not diced green peppers?
A. This is not to say that green peppers have never been involved in an outbreak, they have. But they have not been involved in enough outbreaks and have not made enough people ill or killed them to make them unsafe if not properly handled. This list is compiled by statistics compiled by the Center for Disease Control (CDC).

Q. What’s up with untreated garlic & oil mixtures?
A. Garlic also comes from the soil. It is possible that it could contain a bacterium called botulism. Botulism is an anaerobic bacterium which means it does not require oxygen to survive. When placed in an airtight bottle with oil the environment is perfect for FATTOM and the botulism can multiply to unsafe levels (as in a swollen can).
**Food Safety Hazards**

**Preventing Bacteria Growth**

**PH and Water Activity**

**Water Activity**
- Water activity is the measure of available water molecules in food.
- It is represented by the symbol \( aw \).
- The availability determines the shelf life of food (an example would be dried salami, tomatoes & raisins).

**PH (Acidity)**
- Bacteria like a slightly acidic to neutral PH level; 4.6-7.5

Changing a foods acidic level like sushi rice or foods that are immersed in certain types of marinades can stem the growth of bacteria. Removing water (moisture will do the same to foods like salamis, tomatoes, beef jerky.

**Time & Temperature**

The most important factor in food safety for protecting food from BACTERIAL growth is T & T. It is the one factor that we have the most control over, through the entire FLOW OF FOOD. Educating and training your staff to understand this is crucial in maintaining a high standard of food safety.
Reduced oxygen packaging is a process in which air (oxygen) is removed from the packaging. Since oxygen is one of the factors needed to promote pathogenic growth its removal will slow or stop the growth of pathogens. It is important to remember that in most jurisdictions anyone who wants to package food for storage using ROP must obtain a variance from the jurisdiction. A variance is permission to do something that is currently not allowed. In addition, one of the requirements of the variance is usually having a HACCP plan prepared for the process. One of the main reasons for this is because if not done correctly (the ROP) it is possible that a pathogen like Botulism could be present and if incased along with the product Botulism has the ability to multiply without oxygen (it is an anaerobic bacteria).

An example of a swollen can due to an anaerobic pathogen

Changing a foods acidic level like sushi rice or foods that are immersed in certain types of marinades can stem the growth of bacteria
There is good mold, the mold that cures, flavors and defines certain cheeses. Then there is mold that’s ugly but helps to tenderize and add character. Then there is the bad mold, spoilage mold that breaks down the nature of products while changing its structure, flavor and odor. This mold (spoilage mold) product just gets thrown away.

MORE BIOLOGICAL HAZARDS

PARASITES – *Biological Hazard/Contaminate.*

- Require a host to live and reproduce (like viruses).
- They are associated with seafood, wild game and food processed with contaminated water, such as produce.
- Make sure that fish to be served raw or undercooked is correctly frozen by the purveyor.

FUNGI – *Biological Hazard/Contaminate*

- Includes yeasts, molds and mushrooms.
- Some molds and mushrooms produce toxins (a biologically produced poison). There are good molds, certain soft cheeses and there is good yeast like the yeast for making bread or alcohol products.
VIRUSES: Biological Hazard/Contaminate

Hepatitis A –
- Commonly linked to shellfish from contaminated waters and ready to eat foods.
- An infected person might not show symptoms for several weeks or not at all. These people are referred to as carriers.
- Jaundice (a yellowing of the flesh and whites of the eyes) is a common symptom.
- Prevention; Exclude food handlers who have had jaundice for 7 days or less from the operation. Wash hands properly after using the toilet, avoid bare hand contact and purchase shellfish from an approved reputable vendor.

Norovirus –
- Commonly linked to contaminated shellfish and ready to eat foods.
- A small amount of the virus can make a person ill.
- An infected person might see symptoms appear in as little as a few hours after ingesting the virus.
- Prevention; Always exclude staff with diarrhea and/or vomiting, wash hands frequently, avoid bare hand contact and purchase shellfish from approved vendors.

Viruses can only survive if they have a living host—human or animal.
Practicing proper personal hygiene is the surest way to prevent virus infection.
Cooking or freezing do not kill viruses

All of the Big 6 illnesses share some common symptoms.
The most common way that food and food contact surfaces become contaminated is when an infected food handler does not wash their hands sufficiently after using the rest room.
We refer to this as the “Fecal Oral Route”

Food Safety Hazards
Important Facts

Viruses need a living host to survive, like...

Practicing good personal hygiene will prevent viruses from spreading.
WASH YOUR HANDS, WASH YOUR HANDS, WASH YOUR HANDS
This is the number one way how a pathogen is spread. Since pathogens are microscopic, and undetected by the naked eye, it is very possible that after someone uses the toilet their hands and/or fingers may still contain feces attached to a hair on the hand, twix a crease in their skin or under a finger nail. When they leave the lavatory and go to a buffet or into the kitchen everything they touch can be contaminated. When touch by someone else the cycle continues. Everyone who ingests food that was contaminated becomes a candidate to become ill. Remember, viruses are mainly prevented by good and frequent hand washing, while bacteria are stopped primarily by time and temperature control.

**Biological Toxins - Biological Hazards/Contaminates**

Some toxins (poisons) are associated with certain plants, mushrooms, and seafood. They can be a natural part of the product or can be caused by external issues.
Histamine on certain fish like tuna, mackerel or mahi-mahi becomes a safety issue if the fish is time-temperature abused. Fish like barracuda, snapper or grouper (predatory fish) that eat smaller fish that eat contaminated algae can become contaminated with ciguatera toxin. Histamine can cause severe allergic reactions and ciguatera can cause vomiting, diarrhea or neurological symptoms like hot and cold sensations, difficulty breathing, and rapid heartbeat or hives.

- Toxins cannot be destroyed cooking or freezing.
- The most important prevention is to purchase from approved reputable sources.
- It is also important to control time and temperature when handling certain raw fish to prevent histamine poisoning. (Scombroid poisoning)

Common symptoms for the above illnesses are:

- Diarrhea
- vomiting, fever
- nausea,
- abdominal cramps
- Jaundice.
- Heart palpitations
- Difficulty breathing
- Reversal of hot and cold sensations
- Tingling in the extremities

Onset time (the time it takes for symptoms to start) can be anywhere from 30 minutes to six weeks. An individual might suffer anywhere from mild diarrhea to death.

Food Safety Hazards

The Big Six Pathogens

- Shigella
- Shiga Toxin E-Coli
- Salmonella Typhi
- Non - Typhoidal Salmonella
- Norovirus
- Hepatitis A

- Report infected staff to local health department.
- Infected staff cannot return to work without a doctors note.
- They must be symptom free.
While these are the six main pathogens that we are concentrating on in food safety, there are many variations. There are many different variations of ecoli, salmonella, etc. Also there are many more pathogens that affect food safety; Bacillus Cirrus, Campylobacter, Giardiais, Staphylococcus. But for now concentrate on these six.

**Food Safety Hazards**

**High Risk Categories**

- Seniors may have a weakened immune system because of existing conditions, medications, and diet.
- Pre-School children have not fully developed immune systems.
- People receiving chemotherapy or HIV treatment, as well as transplant patients. These individuals' immune system is already working hard. They are more susceptible.

**What is a High-Risk Population?** It is a category of people whose immune system is being challenged, such as the elderly, due to poor eating habits, medications, and diminished immune system, the very young (toddlers); their immune system has not fully developed, transplant recipients and those people receiving chemo-therapy or HIV treatment. These groups cannot take a chance of getting a food borne illness infection on top of their current condition. If your operation includes any people in the high-risk group, it is a good policy to take extra care and precautions during the “Flow of Food” through your operation.

**SAFE SERVICE OF ELDERLY PEOPLE**

Operations that serve mainly a high-risk group such as the elderly in assisted living, nursing homes, etc. should take extra precaution and follow the following guidelines:

- Never serve raw seed sprouts
- Raw or undercooked eggs (use pasteurized eggs)
- Raw or undercooked meats, seafood.
- Unpasteurized milk or juice.
Allergies is the body not recognizing certain proteins. When this happens, it goes into a defense mode. Food allergies have become a major concern in the food industry and it will only get to be a bigger concern as time goes on. Create a protocol for dealing with allergy orders and train your staff to follow it 100% of the time. Even the smallest insignificant mistake in preparation or service can result in a crisis. Remember we refer to the transferring of allergens from one surface to another as "CROSS CONTACT" and not cross contamination.

The first line of defense is to inform the consumer that they should inform the business if they do have an allergy or intolerance (a food product or ingredient that an individual has a problem digesting).

Staff should be trained not to answer allergy customer questions unless they have been trained and allowed to do so. The allergen order from the very beginning needs to be carefully monitored and kept separate through service. All equipment must be washed rinsed and sanitized prior to use in preparing an allergy order. A manager should oversee all allergy orders.

A person who has an allergic attack can become seriously ill. Check your local regulatory to see if you can give out Benadryl or an epee pen to someone who is having a reaction. Unchecked they could go into anaphylactic shock.
**Food Safety Hazards**

**Restriction Vs. Exclusion**

A food service employee comes to work with a sore throat & slight fever. In a non risk operation an employee may continue to work as long as they don’t handle any food.

In a high risk operation anyone not feeling well what so ever is sent home.

- A food handler has a sore throat and fever, **RESTRICT** the food handler from working around food until the food handler gets a release from a medical practitioner.
  - **EXCLUDE** this food handler if he works in a high-risk location until he gets a release from a doctor or medical practitioner.
- If a food handler is experiencing vomiting, diarrhea or jaundice
  - They must be excluded from the operation and cannot return until he is symptom free for 24 hours and has a release from a medical practitioner.
- If a food handler lives with anyone diagnosed with the following, Hepatitis A, Salmonella Typhi, Shiga toxin producing e-coli, Norovirus or Shigella
  - He must be excluded from the operation
  - You must notify the department of health
  - He cannot return to work until symptom free and then cleared by the department of health or his medical practitioner

**Food Safety Hazards**

**The Big Six Pathogens**

- Shigella
- Shiga Toxin E-Coli
- Salmonella Typhi
- Non - Typhoidal Salmonella
- Norovirus
- Hepatitis A

- Report infected staff to local health department.
- Infected staff cannot return to work without a doctors note.
- They must be symptom free.
## TEST YOUR KNOWLEDGE

### Chapter #2

Column #1 are the questions. Choose the correct answer from the choices in column #2 and write the letter in the corresponding box in column #3.

Please note, some answers are used more than once and some are not used. The answer key is located below the questions and answers upside down.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>It is a poison</td>
<td>A Living hosts for viruses</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Sustained use can cause splintering and become a food hazard</td>
<td>B Medical ID bracelet</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>What information on chemicals is required by OSHA</td>
<td>C Rubber spatula</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>The best way to prevent bacteria from multiplying is</td>
<td>D Egg shells mix in with food</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>Pigs, sheep, cattle and people are</td>
<td>E Lead Pots</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>This is a physical hazard</td>
<td>F Cooper tubing</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td>Causes discoloration and off odor</td>
<td>G Safety Data Sheets (SDS)</td>
<td>7</td>
</tr>
<tr>
<td>8</td>
<td>Can be caused by Salmonella Typhi</td>
<td>H Every 20 minutes</td>
<td>8</td>
</tr>
<tr>
<td>9</td>
<td>The range on the ph scale that bacteria like to thrive in</td>
<td>I Toxins from chemicals, fish or mushrooms</td>
<td>9</td>
</tr>
<tr>
<td>10</td>
<td>May not be worn when working in a kitchen</td>
<td>J Contaminated well water</td>
<td>10</td>
</tr>
<tr>
<td>11</td>
<td>On average, bacteria double every</td>
<td>K Prevent Time and Temperature abuse</td>
<td>11</td>
</tr>
<tr>
<td>12</td>
<td>Another name for Scombroid poisoning</td>
<td>L A type of Reduced Oxygen Packaging (ROP)</td>
<td>12</td>
</tr>
<tr>
<td>13</td>
<td>Is affected by time-temperature abuse</td>
<td>M 4.6-7.5</td>
<td>13</td>
</tr>
<tr>
<td>14</td>
<td>Sous Vide is</td>
<td>N Spoilage mold</td>
<td>14</td>
</tr>
<tr>
<td>15</td>
<td>Can be a problem in a soda system</td>
<td>O Histamine poisoning</td>
<td>15</td>
</tr>
<tr>
<td>16</td>
<td>When interacted with acidic food can cause toxic metal poisoning</td>
<td>P High Risk</td>
<td>16</td>
</tr>
</tbody>
</table>

### ANSWER KEY

1 I 2 C 3 G 4 K 5 A 6 D 7 N 8 J 9 M 10 B 11 H 12 O 13 O 14 L 15 F 16 E
CHAPTER 3
ACTIVE MANAGERIAL CONTROL
The 5 risk factors for food borne illness

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

The Center for Disease Control (CDC) a government agency gathers food safety data from all around and has determined that these are the main risk factors.

The CDC’s 5 risk factors are very important to your total operation. These are the main things that the health department looks for when they come in to do an inspection. They are looking to see if there is active managerial control. The FDA recommends the following ways to achieve AMC; by applying prerequisite policies and procedures, staff training programs and manager supervision. Remember to apply these protocols throughout the entire “flow of food”. Active Managerial Control is now considered the key food safety plan for a retail operation. It replaces HACCP in that regard. HACCP is still essential when it comes to dealing with a retail operation that does any processing in the business which may require a variance.

**Purchasing, Receiving and Storage** *(ACTIVE MANAGERIAL CONTROL)*

Always purchase from approved, reputable suppliers who follow federal, state and local rules and regulations.

Delivers should be made when you have time and staff to check deliveries in properly. Check one delivery at a time.

- Make sure all items are labeled properly, what you ordered and in good condition.
- No broken bags to torn boxes, return any dented cans or evidence of insect infestation.
- Make sure recalled items are stored separately and marked clearly prior to pick up and are noted on paperwork.
- Store items as soon as possible *(to avoid time temperature abuse)*
- Check for proper temperatures; insert thermometers into items whenever it’s possible without compromising the integrity of the package.
- Make sure that all products have the right color, odor and texture, reject those that do not.
- If receiving live shellfish make sure the bag or box has the required shell stock i.d. tag attached.
- If buying farm raised fish make sure the package contains the necessary required documentation.
- For raw service how it was frozen and thawed to kill any parasites that may have been present, keep all documentation for 90 days starting with the last day you had the product in your possession.
- Reject cans if they have severe dents, deep dents in the seams, no labels, swollen or bulging at the ends, holes or visible signs of leaking and rust.
- Key Drop Deliveries; for off hours deliveries when there is no one to receive it is sometimes necessary to have the driver have access to the operation. All receiving guidelines must be kept when this happens.

* (ACTIVE MANAGERIAL CONTROL)
Special Receiving and Inspecting temperatures

- **Cold TCS food:** Receive at 41 or lower, unless otherwise specified.
- **These may be received at 45 degrees or:**
  - **Live shellfish:** oysters, mussels, clams, and scallops
- **Shucked shellfish:**
- **Fresh milk:**
- **Fresh shelled eggs:**

SHELLFISH MAY ALSO BE ACCEPTED IF THE INTERNAL TEMPERATURE OF THE SHELLFISH IS 50 DEGREES (F) OR LESS. They then must be cooled to 41 degrees within 4 hours of receipt.

When storing food, it is important to follow specific guidelines to ensure quality and safety.

- All items should be labeled
- When repacking foods with the item name on the label and use by date.
- All foods prepared in house must be labeled with the use by date clearly marked on it.
- If kept at 41 degrees or lower you may keep these items for up to seven days.
- Be careful, the clock starts with the oldest ingredient in the item. For example, if you cook chicken on Monday and make chicken salad on Tuesday you have to start the count from Monday.

**First In First Out—FIFO** is a system used to rotate inventory that does not have use-by or sell-by or expires on dates. The first case of lettuce that comes in should be the first case to go out (used), while for items with use dates the item with the earliest use-by, sell-by or expires on should be used first no matter in what order it was received.

An example would be:
You received 1 case of milk on June 1st dated June 10th and put them in the back of the refrigerator.
On June 5th you received 1 case of milk dated June 9th.
These would go in front of the ones you already had in the refrigerator because the date is older. It does not matter when you received them, we rotate on expiration date.
by, best by, etc……. More work and industry agreement have to be done in this area. For now, the best explanation for this is; do not use foods that have no indication of when it should be used by. The use by or expiration date is the manufacturers recommended date.

To help prevent cross contamination (the transferring of pathogens from one surface to another surface)

- Store all items in designated storage areas,
- Keep food away from walls and at least 6 inches off the floor.
- Single service items (disposables) should be stored in their original packaging.
- Store products in containers intended for food storage that are National Safety Foundation (NSF) approved.
- Never use used chemical buckets to store food product.

Make sure all foods are covered or wrapped properly and store raw food products properly.

- Properly means storing raw food product based on their recommended internal cooking temperatures.
- The higher the temperature the lower it gets stored.
- Poultry (including eggs) will always be on the bottom (cooked to 165 degrees with nothing else cooked higher)
- Ready to eat foods always on top (no further cooking so any chance to kill pathogens that may be present).

Honest Presentation of Food. The color of food whether raw or cooked is an indication of its quality, freshness and safety. Do not mislead consumers by altering with food additives, colored wrapping or special lighting.

ROP stands for reduced-oxygen packaging. It includes MAP, vacuum-packed, and sous vide food.
• It may be possible to check the temperature of bulk food by folding the packaging around the thermometer stem or probe. You must be careful not to puncture the packaging when using this method.

**Active Managerial Control**

**Shell Stock Identification Tags**

- Must accompany all shellfish (mollusks).
- Tells the who, what, where, when and must accompany the container wherever stored or displayed.
- Kept on file for 90 days starting with the last day in possession.

**Farm raised fish**

- Must have documentation stating the fish was raised to FDA standards.
- Keep documents for 90 days from the sale of the fish.

**Fish served raw or cooked served rare**

- Certain species of fish must have documentation that the fish was frozen and properly thawed to kill any parasites.
- Keep on file for 90 days.

**Active Managerial Control**

**Step 2 Flow of Food**

**12 Tips for Food Storage**

1. Follow the First In, First out (FIFO) rule.
2. Shelf raw food in refrigerator according to internal cooking temperature, lowest down to the highest (poultry products including raw shell eggs always on the bottom).
3. Store in air tight containers.
4. Store all food at least 6 inches off the floor.
5. Cold food is properly stored when the internal temperature of the food is 41°F or lower.
6. Never cool hot food in the refrigerator.
7. Do not overload refrigerators and freezers.
8. Refrigerator lighting a minimum of 10 foot-candles.
9. Label and date where needed.
10. Keep shelves, walls, floors and doors clean and organized.
11. When in doubt, throw it out.
12. ICE IS FOOD, treat it properly. Never use bare hand contact, ice bins and machines cleaned on a regular basis, never leave the scoop in the ice and store it properly.

**TIP:** Walk in refrigerators are also referred to as coolers, and boxes
Labeling food is important for many reasons. Illnesses have occurred when unlabeled chemicals were mistaken for food such as flour, sugar, and baking powder. Customers have also suffered allergic reactions when food was unknowingly prepped with a food allergen that was not labeled.

**Labeling food packaged on-site for retail sale:**
Food Packaged in the operation that is being sold to customers for use at home, such as a bottled salad dressing, must be labeled. The label must contain the following information:

- Common name of the food or a statement that clearly identifies it
- Total weight of the food
- List of ingredients and sub-ingredients in descending order by weight. This is necessary if the item contains two or more ingredients
- List of artificial colors and flavors in the food. Chemical preservatives must also be listed
- Name and place of business of the manufacturer, packer or distributor
- Source of each major food allergen contained in the food. This is not necessary if the source is already part of the common name of the ingredient

**PREVENTING CROSS CONTAMINATION**

Cross Contamination is the transferring of pathogens from one surface to another surface. These surfaces can be equipment, food, clothing or people.

- Use separate coded equipment.
- Designated special times to do certain jobs.
- Wash, rinse and sanitize whenever changing tasks.
- Separate work areas.
- Store raw foods properly by internal temperatures.
- Change gloves when changing tasks.
- All buffet or steamtable items should have their own serving piece.
Pathogens can grow when food is not stored at the correct temperature. Follow the guidelines on the slide to keep food safe. Remember that the proper temperature for storing cold food is 41 degrees or lower. This means that the internal temperature of the food in storage and not the ambient air temperature of the refrigerator unit. The same is true for hot holding. Go by the internal temperature of the food not the oven temp.

**Active Managerial Control**

**Step 2 Flow of Food & Required Storage Temperatures**

Temperatures:

- Store TCS food at an internal temperature of 41°F (5°C) or lower or 135°F (57°C) or higher.
- Store frozen food at temperatures that keep it frozen.
- Make sure storage units have at least one air temperature measuring device; it must be accurate to +/- 3°F or +/- 1.5°C.
- Place the device in the warmest part of refrigerated units, and the coldest part of hot-holding units.
- When removing product from storage for prepping, take a small amount at a time to avoid time temperature abuse.

- Food must be rotated in storage to maintain quality and limit the growth of pathogens. Food items must be rotated so that those with the earliest use-by or expiration dates are used before items with later dates.
- Many operations use the first-in, first-out (FIFO) method to rotate their refrigerated, frozen, and dry food during storage. Here is one way to use the FIFO method.
- Many operations especially schools and institutions are required to keep track of their inventory. The reason is two-fold. First it is a way to expedite recalls should it be necessary and second it aids in proper purchasing and tracking within an operations flow of food.
Raw food is stored under refrigeration based on the products recommended internal cooking temperature. The lowest temperatures go on the top and as you go down the temperatures become higher.

Top:  Ready to eat/ 135F
Bottom: Poultry/165F

**Active Managerial Control**

**Step 2 Flow of Food**

**Raw Food Storage in Refrigerators**

<table>
<thead>
<tr>
<th>Proper Food Storage Order</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ready to Eat Foods</td>
</tr>
<tr>
<td>Raw Seafood</td>
</tr>
<tr>
<td>Raw Whole Meats</td>
</tr>
<tr>
<td>Raw Ground Meats</td>
</tr>
<tr>
<td>Raw Poultry</td>
</tr>
</tbody>
</table>

**Active Managerial Control**

**Step 2 Flow of Food**

**Storage**

**Preventing cross-contamination:**

- Store all items in designated storage areas.
- Store items away from walls and at least six inches (15 centimeters) off the floor.
- Store single-use items (e.g., sleeve of single-use cups, single-use gloves) store in original packaging.

**Do Not Store Food**

- Locker rooms or dressing rooms.
- Restrooms or garbage rooms.
- Mechanical rooms.
- under unshielded sewer lines or leaking water lines.
- Under stairwells.
PREPARATION

Always start out by making sure all surfaces and equipment are clean and sanitized. Only remove the amount of product that you need to prep to avoid time/temperature abuse.

**Produce:** Wash produce before prepping in water slightly warmer than the produce. Remove outer leaves check for soil and insects. If soaking produce do not co-mingle different types in water. Fresh cut produce needs to be kept at 41 degrees or lower.

If serving a high-risk community refrain from serving sprouts and use pasteurized eggs if possible. Be very careful preparing salads like tuna, egg, chicken or pasta. Make sure all items are well chilled including mixing bowls and spoons.

**ICE:**
- Ice needs to be treated as a food.
- Never use ice that has been used to chill products
- Keep ice scoops in designated holders and clean.
- Do not scoop ice with hands or glasses

All repackaged foods must be labeled
All food prepped in house can be kept for 7 days if kept under 41 F
The 7-day clock starts with the oldest ingredient. So, if you are mixing shrimp and scallops and the shrimp was cooked on the 2nd of the month and the scallops were cooked on the 3rd your 7 days starts on the 2nd and that food must be discarded if not eaten by the 9th.

**These labeling requirements do not apply to customer’s leftover food items placed in carry-out containers.**

**Preparation Requiring a Variance:** A variance is special permission given by the local regulatory authority to perform a process normally not allowed. In giving permission to do this the local authority usually requires that the requesting establishment show proof of the ability to keep the product safe. This proof usually comes in the form of a HACCP plan. The following items usually need a **variance:**
• Packaging fresh juice on site to be sold at a later time, unless the juice has a label warning the consumer that complies with any local regulations.
• Smoking food for preservation (it’s okay to smoke to add flavor).
• Using additives to change the pH or other means of additives so the product is no longer subject to time and temperature control.
• Using a curing process.
• Using foraged products that do not get properly inspected (a deer dressed, cooked and served at a local restaurant), otherwise known as custom processing.
• Packaging food using a reduce oxygen method. Including MAP, vacuum packed and sous vide.
• Sprouting seeds or beans.
• Offering live shellfish from a display tank.

**Thawing Food:** There are four acceptable ways to thaw frozen food

• Under running water not more than 70 degrees, strong enough to remove bits that become defrosted, once the surface of the product reaches 41 degrees you have only 4 hours left to finish defrosting.
• In a microwave, turn half way through, but you must finish cooking the item and not return the item to storage.
• As part of the cooking process, examples are frozen fries, onion rings, mozzarella sticks and 3-4 oz burgers.
• The last and best way is under refrigeration.

_Thawing ROP Fish:_ Frozen fish may be supplied in reduced oxygen packaging (ROP). This fish should usually remain frozen until ready for use. If this is stated on the label, removed from the packaging at the following times

• Before thawing it under refrigeration
• Before or immediately thawing it under running cold water

When defrosting under water the water temperature may not exceed 70 degrees, the force of the water must be strong enough to knock off and bits or pieces that become loose and when the surface of the product reaches 41 degrees you only have 4 hours left to complete the defrosting.

When defrosting using a microwave oven, remember to finish cooking the product immediately following use of the microwave. Do not put the product back into storage.

When you directly cook a frozen product such as French fries, chicken fingers or mozzarella sticks, make sure products are cooked to the proper internal temperature.

**Defrosting under refrigeration is the number one recommended way to thaw out products.** It is the safest way and will also contribute to maintain a products quality. Make sure you plan properly to remove frozen products in time to safely defrost.

Fish that has been individually vacuum packed and frozen must have the vacuum packaging removed prior to defrosting.
RECOMMENDED INTERNAL COOKING TEMPERATURES
The FDA recommends that particular foods need to reach a specific minimum internal temperature to reduce pathogens to safe levels.

For example:  
- Poultry – 165 – To Reduce Salmonella Bacteria  
- Ground Beef – 155 – To Reduce E-Coli Bacteria  

These are recommendations. You are allowed to cook a customer’s order to a requested lower temperature if you serve the food immediately after cooking it.

For Example: A Rare Steak (110-115 degrees internally)

It is also recommended that if you are serving a high-risk population, all foods should be cooked to the recommended internal temperature. The FDA is asking the states to code this in particular for children.

HOLDING TEMPERATURES:
After food has been prepared and/or cooked properly you can keep it safe by holding it under refrigeration (41 degrees or lower) or in a hot holding unit, for example, a steam table or warmer (135 degrees or higher). The reason for this is that harmful microorganisms multiply much slower below 41 and above 135.

REHEATING TEMPERATURES:
Food that has been cooked and properly cooled and kept at 41 degrees or lower has to be reheated to 165 degrees within 2 hours if you want to hot hold it at 135 degrees.

(Example: soup)

Food that is being reheated for immediate service can be reheated to any desired temperature.

(Example: hot roast beef sandwich, or a container of soup) since it does not stay in the temperature danger zone for an extended period of time.
Throughout the **FLOW of FOOD**, it is imperative that food product spend as little time as necessary in the danger zone especially between 70 and 125 degrees. Bacteria will multiply in the danger zone and will multiply very fast between 70- and 125-degrees Fahrenheit.

**Other Temperatures:**

**THIS IS REAL IMPORTANT STUFF!**

- Water at Hand Washing Station / minimum **100°** (ServSafe Exam = Warm Water)
- Defrosting Under Running Water / maximum **70°**
- Reheating TCS Foods / **165°** minimum and no more then within 2 hours
- Temperature Danger Zone / **between 41° and 135°**
- Most Rapid Growth / **between 70° and 125°**
- Hand Dishwashing / warm water, Heat Sanitize: **171°** Chemical Sanitizer **Manufacturer Directions**
- High Temp Dishwasher Final Rinse Temperature / minimum **180°**

Stationary single rack dishwashing machine **165°**

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**EGG INFO**

Never pool eggs, if you do make sure it will be for items that will be fully cooked.

Use pasteurized eggs for Hollandaise sauce, Caesar dressing or for eggs that ooze when served.

Use pasteurized eggs for High Risk populations.

Cooking temperature for eggs vary; 145 degrees for eggs that will be held before service (like a buffet), and 135 degrees for eggs served immediately.
**PAR COOKING:**
When prepping which includes cooking, but only cooking part of the way, follow these two rules; 1. The initial cooking time cannot exceed 1 hour (60 minutes) 2. When you finish cooking the product you must cook it to its recommended internal temperature.

After the initial cooking the product must be cooled and stored under refrigeration as quickly as possible. Some examples of par cooking:
- Blanching vegetables
- Grill marking fish, steaks
- Searing off roasts

**SAFE BUFFET SERVICE**
- Labeling of serving pieces and/or items is very important.
- Every item needs its own serving piece
- Sneeze guard 14” up, 7” out
- Monitor buffets to ensure food safety and food defense
- Ensure guests take a clean plate each trip
- Please use a clean plate for each visit to the buffet

In addition to labeling serving pieces you also label each food item and if possible indicate if any item contains a major allergen or intolerance.
A pan of lasagna is removed from the warmer (it is 135 degrees internally or higher) and it is placed on a buffet table without the use of a chafing dish with sterno's. It may safely be left on the table at room temperature for up to four hours. At the end of the four hours it has to be discarded.

While a cold platter of antipasto salad is removed from the refrigerator (41 degrees or lower) and is placed on the buffet table without any ice to keep it cold. It may stay on the table at room temperature for up to six hours. One difference from the hot food is, if at time during the six hours the internal temperature of the salad goes above 70 degrees it has to be discarded.

Most jurisdictions require a variance to do this. (An application to the local health department to do something that is currently not allowed).

If you serve a high-risk group you may not use time as a safety factor

Types of Thermometers:

- **Infrared**: shoots a beam of infrared light to check temp, only works on surface temperatures cannot penetrate food products like a roast or turkey.
- **Bi-metallic**: checks temperatures from zero degrees Fahrenheit to 220 degrees, needs to be calibrated frequently and requires insertion up to the dimple between 2-3 inches of the stem inserted, if not done properly you will not get an accurate reading.
- **Thermocouples and thermistors** are digital thermometers that have interchangeable probes. The probe is the part of the thermometer that directly interacts with whatever you are trying to get a reading on. The probes are tip sensitive and need only to be slightly inserted into the product for an actual correct reading.
- **Time Temperature Indicator** is a device used to track the temperature of product during storage and/or transportation. A reading of extend time in the danger zone indicates that you should not accept this item or possibly the entire delivery.
Maximum Registering Tape is a special tape placed on items going through a hot water dishwasher. It will self-record the highest temperature reached during the cycle so you can
- determine if your dishwasher is working properly (180 degrees) or waterproof thermometer that records or holds.

Types of Probes:
- **Penetration** is any kind of probe that is physically stuck into the food.
- **Surface** is a probe that flattens out at the end in order to have it sit flush to the surface of a grill for example. It can also be used to check the temperature of frozen products.
- **Immersion probe** is a long probe for use with large stockpots, kettles or deep sinks.
- **Air probes** are used to check the temperature inside refrigerators and freezers.
- The difference between regular thermometers and thermocouples and thermistors is the design inside of them. They use technology that measures temperature through a metal probe, and the temperatures are displayed digitally.

Thermometer Guidelines:
- Make sure thermometers are calibrated properly by using the ice point or boiling point methods.
- You have a plus or minus 2 degree spread to maintain accepted accuracy.

**Be sure to calibrate your thermometer daily!!!**

Time Temperature Abuse occurs when food is left in the temperature danger zone for extended periods of time. To keep this from occurring always:
- Use calibrated thermometers
- Monitor
- Use corrective action when necessary
- Never use glass thermometers that are not specially designed for foodservice.
- Always check product temperature in two locations. One location should always be the thickest part.
- Always clean and sanitize before and after use.
These are industry recognized methods of cooling food safely. Usually you need to incorporate two of these methods to reach the proper temperatures in the allotted time.
Cooling Food  If you are cooling food and you do not think you will reach the required temperature in the allotted time you may start all over by reheating the product to 165 degrees within 2 hours and starting the cooling process again. You can do this any number of times. Eventually the products quality will deteriorate, but it will be safe to consume.

You may reheat and cool as many times as you like provided you do it within the safe time allotments. If you do the first step faster than 2 hours, the remaining time can be added to the second stage of cooling.
If items come sealed from the factory package and not used, they may be saved and reused. Anything package in house and served must be thrown out even if not used.

It is considered a best industry practice to have a separation of duties. Staff that serve should not bus soiled service ware unless they wash hands in-between functions.

Servers should be informed as to what is in a dish. This will help them help customers with allergies.
The FDA code recommends that silverware not wrapped in a napkin or other packaging must be cleared and washed, rinsed and sanitized even if the setting was not used but people were sitting at that table. If rolled up it may be left on table and used for the next seating. Always handle serving plates by the bottom or side. Hold cups and glasses by the stem or handle. Do not stack glasses when carrying. Always use an ice scoop for handling ice.

**SERVING UTENSILS**
Utensils that are used on buffets, service lines or during preparation continuously must be changed at a minimum of every 4 hours. If working with non TCS foods, serving utensils may be left on clean and sanitized food contact surfaces or be left in a container of running water or stored in a container of water that is maintained at a minimum of 135 degrees.

*Active Managerial Control*

**Ready-to-Eat Food Requires**
No Bare Hand Contact
Use disposable gloves, tongs, dell paper to handle

**Ready-to-eat food is food that can be eaten without further:**
- Preparation
- Washing
- Cooking

**Ready-to-eat food includes:**
- Cooked food
- Washed fruit and vegetables
- Deli meat
- Bakery items
- Sugar, spices, and seasonings

*Use the following items to handle ready-to-eat-foods*

---

**PERSONAL HYGEINE** *(ACTIVE MANAGERIAL CONTROL)*

The importance of creating and monitoring a Good Personal Hygiene program should include all of the aspects mentioned below. Employees should be made aware of these conditions before they begin their job and reminded as needed. The program should be a part of the employee manual.

**Observing Staff Illness:**
- Management should always be on the lookout for signs of employee illness, including; Vomiting, frequent bathroom trips, jaundice, sweating or chills and constant nasal discharge
Food Handlers can contaminate food in the following ways:
- If they have a food borne illness
- If they have wounds that can contain pathogens
- When they sneeze or cough
- When they come in contact with a person who is ill
- When they touch something that can contaminate their hands and they fail to wash their hands
- If they have symptoms such as diarrhea, vomiting or jaundice
- Or if they do not feel sick but they are infected (we call these people carriers), they can still infect others

Food Handlers actions that can contaminate food:
- Scratching their scalp or other parts of their body
- Running fingers through their hair
- Rubbing an ear
- Touching a pimple or infected wound
- Wearing a dirty uniform or their or clothes that are soiled
- Improper coughing or sneezing
- Spitting in the operation
- If they are infected with a pathogen, but do not show any signs of it, they may still contaminate others and objects by using the toilet, cleaning themselves and then not properly washing their hands. This is referred to as “The Fecal Oral Route”.
- Open infected wounds or boils are dangerous if not covered properly. If they are oozing pus precautions must be taken to see that the wound is contained. Proper bandaging is required depending upon the wound location. If on the hand, after bandaging, a single use glove should be worn.

It is very important for a food service operation to have a good personal hygiene program. It should include policies pertaining to staff hygiene and health, a good training program, modeling of policies by management, supervision of policies and revisions to policies when needed.

Hand washing is critical to a safe operation.
- There must be an adequate number of available dedicated hand washing sinks (prep areas, wait stations, bathrooms, dishwashing areas). These sinks must be designated for hand washing only. Use of other sinks such as; prep, pot sinks, utility sinks are forbidden to be used for hand washing.
- they must properly supply (soap, hot and cold running water disposable paper towels and/or a warm air hand dryer
- trash can for the towels
- sign reminding employees to wash their hands

Proper Hand washing technique
Wet hands and arms first, apply soap, scrub hands, forearms, between fingers and under nails for approximately 10-15 seconds, rinse with warm water, dry with paper towel and use towel to turn off faucets. The entire process should take approximately 20 seconds.
Hand sanitizers are used only after proper hand washing and only as an added layer of protection and not as a substitute for hand washing.

Hands should be washed:
- Before starting work
- Before and after handling raw meat, poultry and seafood
- When sneezing, coughing or using a tissue
- After eating, drinking, smoking or chewing gum or tobacco
- Handling chemicals that can affect food safety
- After taking out the garbage
- Clearing tables or busing soiled dishes
- After touching clothing or aprons that are soiled
- Handling money
- Whenever leaving or returning to the kitchen area
- Touching anything that may cause your hands to become contaminated
- After using the restroom
- After handling soiled items
- After touching service or aquatic animals
- After using electronic devices

If food becomes contaminated due to one of the above actions use the following corrective actions:
- Dispose of the contaminated food(s)
- Clean potentially contaminated equipment and utensils
- Retrain or coach individuals who do not follow proper procedure

Guidelines for proper/safe hand care:
- Fingernails should be kept at a proper length
- Do not wear false fingernails or nail polish unless using a single use disposable glove
- Cover all wounds, cuts or boils properly with a bandage covered with a finger cot or disposable glove.

Disposable Glove Use:
- Hands must be washed before putting on disposable gloves (unless changing gloves while working at the same task).
- Use only approved gloves for food service
- Have correct sizes available and if needed an alternative for those allergic to latex
- Always put gloves on properly, never blow into them or roll them up
- Change gloves as soon as they become dirty or torn, before beginning a new task, after an interruption (phone call) and after handling raw meat, poultry or seafood, after 4 hours of continuous work.
• You do not need to rewash your hands each time you change gloves as long as you are performing the same tasks and your hands have not become contaminated

Bare Hand Contact:
• This should be avoided by using tongs, wax paper or disposable gloves to handle ready to eat foods (foods that do not need any further cooking like cold cuts, fruits and vegetable, etc.)
• There are times when it may be acceptable to handle raw food with bare hands
  o The food will be added as an ingredient to a dish that does not contain raw meat, seafood or poultry but will be cooked to at least 145°F. An example of this would be adding cheese to pizza dough
  o The food will be added as an ingredient to a dish containing raw meat, seafood or poultry and the dish will be cooked to the required minimum internal temperature of the raw items. An example of this is adding vegetables to beef stew.
• If your jurisdiction allows bare hand contact, be sure to follow any and all specific policies that you have to put in place as to hand washing, staff health and training.

Personal Cleanliness:
Since pathogens can be found on your skin and hair it is important to bathe or shower before coming to work.

Work Attire:
• Besides giving a bad impression of your business dirty clothing can carry many pathogens that can be transferred to food, work surfaces and equipment.
• Clean clothing or clean work uniforms should be worn daily,
• A hairnet or hat worn to protect hair from falling into or on product. Hair accessories are limited to items that restrain hair from becoming unsafe
• Removal of jewelry with the exception of a solid band ring or band.
• Aprons should always be removed when leaving the prep area and never used to dry hands.

Eating, Drinking and Smoking:
• Is allowed only in designated areas and never in or around prep/service or storage areas.
• The possibility of saliva coming in contact with your fingers could cause pathogens to then be transferred to food or equipment.
• A covered drink with a straw is permissible in a work area.

Cleaning and Sanitizing (ACTIVE MANAGERIAL CONTROL)

Cleaning is removing visible soil and dirt from a surface.
Sanitizing is reducing pathogens to safe levels.

Non-contact surfaces, floors, walls, shelving, that do not come in contact with food need only be cleaned and rinsed to prevent an accumulation of dirt.
Make sure to use coving in all food prep and storage areas. Coving is where the floor and wall meet. Special tiling creates a curved bottom to allow for easier sweeping and mopping. It also makes it harder for rodents to run along the wall, which they like to do.

**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
- Using the wrong chemical
- Using a mislabeled product

**When to clean and sanitize food contact surfaces?**
- After they are used.
- When changing from one task to another.
- After handling different raw TCS fruits and vegetables.
- If there is an interruption while working, and the product may have become contaminated.
- After 4 hours of continued use.
Sanitizing is achieved one of two ways,

1. using heat as in a hot water dishwasher where the final rinse must be **180 degrees** or in a three-compartment sink in which the rinse water must be at least **171 degrees**. This is usually achieved by having a gas burner under the third compartment.

2. The second way is by using chemicals. There are three accepted chemicals for sanitizing in a food service operation.
   a. Chlorine
   b. Iodine
   c. Quats.

3. Make sure your operation uses the right type of **TEST KIT** WHICH CHECKS FOR PROPER CONCENTRATION OF CHEMICALS TO WATER.

<table>
<thead>
<tr>
<th>Product</th>
<th>Water temperature</th>
<th>Concentration</th>
<th>Contact time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorine</td>
<td>100 F</td>
<td>50-90 ppm</td>
<td>7 seconds</td>
</tr>
<tr>
<td>Iodine</td>
<td>68 F</td>
<td>12.5-25 ppm</td>
<td>30 seconds</td>
</tr>
<tr>
<td>Quats</td>
<td>75 F</td>
<td>Check with manufacturer</td>
<td>30 seconds</td>
</tr>
</tbody>
</table>

Important factors when using chemicals as sanitizers are water temperature, water pH, water hardness, sanitizer concentration (how many ppm of water to the chemical) and sanitizer contact time (how long must the items being sanitized be immersed in the sanitizer solution).

If using a heating element to sanitize, the water temperature must remain at **171 degrees**.
Cleaning and sanitizing are a process which can differ depending upon what is being cleaned and sanitized, for example you can be cleaning and sanitizing a surface, individual pieces of equipment, stationary equipment or clean in place equipment.

Depending upon the application you might be:
- washing/rinsing and sanitizing
- washing/rinsing/sanitizing and air drying
- scrape or soak/wash/rinse/sanitize and air dry

No matter what the sequence cannot change!

Sinks can only be used for their intended purpose unless previously “grandfathered”. Meaning the situation existed prior to any new code. If this is the case make sure that the sink and drainboards are washed, rinsed and sanitized whenever changing tasks.
Active Managerial Control

Manual Dishwashing
Cleaning and Sanitizing
Multiple Step Process

1. Pre-cleaning – Scrape and rinse to remove loose food.
2. Wash – Use detergent solutions to remove stuck-on food.
3. Rinse to remove food and detergent.
4. Sanitize to kill attached surviving bacteria and viruses.
5. Air dry.

Before using a 3 compartment sink wash, rinse & sanitize the bays and drain boards.

When using a three compartment sink you will always use the five steps;
   1. scrape or soak
   2. wash
   3. rinse
   4. sanitize
   5. air dry

- in addition, you will need to have a garbage can for the debris from scraping or soaking
- the soapy water must be 110 degrees
- the rinse water can be any temp (the warmer the better)
- the sanitizer sink will depend on how you are sanitizing (hot water/171 degrees or chemicals (follow manufacturer’s instructions)
- a clock with a second hand to keep track of the sanitizer contact time
- air drying with all the items turned upside down to facilitate drying and not letting anything fall in and re-contaminate
- lastly, if using chemicals, you will need the appropriate test strips to check for proper concentration

Remember to keep all silverware in proper storage bins with the handles facing up.
All cleaning tools should be rinsed daily and hung to dry.
Use a utility or mop sink to do this, do not do it in a prep or hand washing sink.
Keep Safety Data Sheets (SDS) available for employee inspection as required by OSHA.
A cleaning program is essential and should incorporate a Master Cleaning Schedule.
High Temperature Dishwashing Machines

Operations using high-temperature dishwashing machines must provide staff with an easy and quick way to measure the surface temperature of items being sanitized. The method used must provide an irreversible record of the highest temperature reached during the sanitizing rinse. This ensures that the dishwasher can reach correct sanitizing temperatures during operation. Maximum registering thermometers or heat sensitive tape are good tools for this.

CONSUMER ADVISORIES:

The FDA promoted using consumer advisories as a positive way to warn people. Some jurisdictions require it be posted on menus and other conspicuous places.

Anytime there is a situation of any type, an incident report should be filled out and kept on file.
Deliberate Contamination (Food Defense)

So far you have learned about methods to prevent the *accidental* contamination of food. But you must also take steps to stop people who actually trying to contaminate it. This may include the following groups.

- Terrorists or activists
- Disgruntled current or former
- Vendors
- Competitors

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.

- **A**ssure: Make sure that products you receive are from safe sources.
- **L**ook: Monitor the security of products in the facility.
- **E**mployees: Know who is in your facility.
- **R**eports: Keep information related to food defense accessible.
- **T**hreat: Identify what you will do and who you will contact if there is suspicious activity or a threat in your operation

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*Active Managerial Control*

**How Food Becomes Unsafe**

The Center for Disease Control (CDC) a government agency gathers food safety data from all around the country.

Five risk factors for foodborne illness:
1. Purchasing food from unsafe sources.
2. Failing to cook food correctly.
3. Holding food at incorrect temperatures.
4. Using contaminated equipment.
5. Practicing poor personal hygiene.

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THIS IS REAL IMPORTANT STUFF!!!
## TEST YOUR KNOWLEDGE

### Chapter #3

Column #1 are the questions. Choose the correct answer from the choices in column #2 and write the letter in the corresponding box in column #3.

Please note, some answers are used more than once and some are not used. The answer key is located below the questions and answers upside down.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>How often must you use a slicing machine that is in constant use?</td>
<td>A Risk factor</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Wash, rinse and sanitize before use</td>
<td>B Approved purveyor</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>An open wound on a food service worker needs to have</td>
<td>C How many days to keep shell stock ID tags?</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>Upon leaving the kitchen always</td>
<td>D Four Hours</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>Average time to complete proper handwashing</td>
<td>E Seven days</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>The transferring of pathogens from one surface to another surface</td>
<td>F Wet hands first</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td>Food prepped in house may be kept for</td>
<td>G Cross contamination Definition</td>
<td>7</td>
</tr>
<tr>
<td>8</td>
<td>Acronym for proper rotation of inventory</td>
<td>H How to pre a 3-compartment sink</td>
<td>8</td>
</tr>
<tr>
<td>9</td>
<td>The first step in a proper hand washing procedure</td>
<td>I Vomit and Diarrhea</td>
<td>9</td>
</tr>
<tr>
<td>10</td>
<td>What is covering used for</td>
<td>J Band aids and Disposable gloves</td>
<td>10</td>
</tr>
<tr>
<td>11</td>
<td>Purchasing food from an unknown source</td>
<td>K 20 seconds</td>
<td>11</td>
</tr>
<tr>
<td>12</td>
<td>Time allotted to receive shellfish out of temp and to cool down to 41 degrees</td>
<td>L Apply soap to hands</td>
<td>12</td>
</tr>
<tr>
<td>13</td>
<td>90</td>
<td>M FIFO</td>
<td>13</td>
</tr>
<tr>
<td>14</td>
<td>Reason enough to send a worker home</td>
<td>N Remove apron</td>
<td>14</td>
</tr>
<tr>
<td>15</td>
<td>Follows local, state and federal guidelines</td>
<td>O Connects kitchen walls and floors</td>
<td>15</td>
</tr>
</tbody>
</table>

### ANSWER KEY

```
1D 2H 3J 4N 5K 6G 7E 8M 9F 10O 11A 12D 13C 14I 15B
```
CHAPTER 4
HACCP
HAZARD ANALYSIS CRITICAL CONTROL POINT
Retail, in the food service industry refers to businesses that sell direct to the consumer; restaurants, hospitals, fast food, schools, institutions, etc. Processing refers to the entities that grow, manufacture, prepare, store and distribute for and to the retail end. Retail HACCP is somewhat different then processing HACCP, though both fundamentally achieve the same goals.

HACCP food safety system is a group of practices and procedures intended to prevent food borne illness. It does this by actively controlling the risks and hazards (Active Managerial Control) throughout the flow of food.

Understanding the flow of food is critical. Beginning with purchasing food from reputable vendors and following down the list each step is critical for keeping food safe.

HACCP IS BUILT UPON A FOUNDATION OF PRE-REQUISITE PROGRAMS, POLICIES AND PROCEDURES AND STANDARD OPERATING PROCEDURES (SOP’S)

Having pre-requisite programs in place is the number one way in which management can show that they have what procedures are managements way of organizing their game plan for food safety. Standard Ops (SOP’s) is managements way of communicating the plan to their staff.

Policies and procedures is managements way of organizing their game plan for food safety. Standard Operating Procedures (SOP’s) is managements way of communicating to their staff how the policies and procedures should be implemented.
There are many systems you can implement to achieve active managerial control of foodborne illness risk factors. Hazard Analysis Critical Control Point (HACCP) is one such system. HACCP (pronounced HASS-ip) is based on identifying significant biological, chemical, or physical hazards at specific points within a product’s flow. Once identified, the hazards can be prevented, eliminated, or reduced to safe levels.
THE SEVEN HACCP STEPS

#1 **Conducting a Hazard Analysis** is as simple as taking the food item in question and examining it through the flow of food to determine any possible potential hazards. Sometimes there may be only one, or a few or possibly none.

#2 **Identifying Critical Control Points** is determining which one of the nine points in the flow of food is the potential problem.

#3 **Establish Critical Limits** is assigning a value such as a minimum internal temperature during the cooking step to ensure pathogens are reduced to safe numbers.

#4 **Monitor Critical Control Points** is how we actually determine if the critical limit is being met, as in the case above did the product reach the minimum required temperature. We would know this because as part of the HACCP plan we indicated we would use a calibrated thermometer with an insertion probe to check the internal temperature.

#5 **Establish Corrective Action** Pre determine what to do if during the process we have not net the critical limit, this is called “corrective action” and in this case that would be to continue cooking the product until it reaches the correct temperature.

#6 **Verification** By keeping a log of checking (monitoring) temperatures of the product we can see if our system is working or do, we need to do more research into the problem.

#7 **Record Keeping** Keeping all logs and/or statistical info including if necessary, dates of service, time of service, who is cooking and who is the manager on duty can have significant impacts on any given problem. Having all of this data can help find and solve any problem.

Conducting a hazard analysis at the retail level is as simple as taking a particular item from your menu and examining it through the nine steps in THE FLOW OF FOOD. Below is an example of a roast chicken. Remember that a particular menu item does not necessarily go through all nine steps and there are times when you return to a step a second as in the case of reheating.

<table>
<thead>
<tr>
<th>STEP</th>
<th>ANALYSIS</th>
<th>CCP</th>
<th>EST CL</th>
<th>MONITOR</th>
<th>CORRECTIVE ACTION</th>
<th>VERIFICATION</th>
<th>RECORDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>RECEIVING</td>
<td>Packed on ice, internal temp. 36 no odors, or discolor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>STORING</td>
<td>Within 15 min. stored in walkin bottom shelf, drain for ice, box temp 38 degrees</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PREPPING</td>
<td>12 Chickens split, removed backbone. And placed in 4” pan with herbs and oil, covered returned to walk in</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COOKING</td>
<td>30 minutes before service placed chicken in a 350-degree oven for 30 minutes, as per recipe, chicken</td>
<td><strong>COOKED INTERNALLY TO 165 DEGREES</strong></td>
<td></td>
<td>USE A CALIBRATED THERMOMETOR</td>
<td>IF INTERNAL TEMP IS NOT 165 OR HIGHER, RETURN CHICKENS TO</td>
<td>DETERMINE SYSTEM WORK BY KEEPING TEMP LOGS</td>
<td>KEEP FILE WITH DOCUMENTATION FOR LATER REFERENCE IF NEEDED</td>
</tr>
</tbody>
</table>
cooked internally to 150 degrees.

<table>
<thead>
<tr>
<th>HOLDING</th>
<th>12 Orders in steam table, 12 in warmer both held at 150 degrees</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVING</td>
<td>As ordered, plated with sides</td>
</tr>
<tr>
<td>COOLING</td>
<td>12 orders left cut into 6’s to cool then placed in walk-in</td>
</tr>
<tr>
<td>STORING</td>
<td>Placed on sheet pans in walk-in</td>
</tr>
<tr>
<td>PREPPING</td>
<td>Next day made chicken salad</td>
</tr>
</tbody>
</table>

**CCP=** CRITICAL CONTROL POINT  
**EST-CL=** ESTABLISH CRITICAL LIMITS  
**MONITOR =** MONITOR CRITICAL CONTROL POINTS  
**CORRECTIVE ACTION=** PROHIBITING, ELIMINATING OR REDUCING THE HAZARD TO A SAFE LIMIT  
**VERIFICATION=** MAKING SURE THE SYSTEM IS WORKING CORRECTLY  
**RECORD KEEPING=** FOR REFERENCE IN THE FUTURE SHOULD THE PROBLEM HAPPEN AGAIN

A method of grouping menu items into one of three processes depending on the number of times the food goes through the temperature danger zone, which is between 41 °F and 135 °F. The Food Process Categories are  
• **No Cook Preparation** (Process #1)  
• **Same Day Service Preparation** (Process #2)  
• **Complex Food Preparation** (Process #3)

Process #1 – **No Cook Preparation**  
Process #1 – No Cook Preparation food items are meant to be kept cold from preparation though service. Potentially hazardous foods that require no cooking and do not
make a complete trip through the temperature danger zone would fall into the No Cook Preparation Process category.

Process #2 – **Same Day Service** Preparation Process #2 – Same Day Service Preparation food items are meant to be prepared hot and served hot the same day. Potentially hazardous foods that are cooked and served in the same day would fall into the Same Day Service Preparation Process category. The food will pass through the temperature danger zone only once before it is served, thus minimizing the opportunity for bacterial growth.

Process #3 – **Complex Food Preparation** Process #3 – Complex Food Preparation food items are meant to be prepared hot and served cooled or possibly reheated. In the Complex Food Preparation Process, a potentially hazardous food passes through the temperature danger zone more than one time.

**HACCP**

**VARIANCE**

An exception to the rule

In food safety a variance refers to a business and/or person who sells to the public asking the local or state board of health for permission to prepare or serve foods that are currently forbidden by law. An example would be if a business wanted to smoke fish for preservation rather than just flavoring. Because of the inherent risks involved this is not allowed. The health department may issue a variance to that business if they can show how they would do it and keep it safe for public consumption. Usually in food safety the business will be required by law to write a HACCP plan which would outline in very specific detail how this will be done. Other retail food items that would require this is serving fresh squeezed orange juice for sale at a later time, vacuum packing or sous vide food, adding vinegar to raise the pH level of a food, curing foods, sprouting seeds or beans, offering live shellfish from a display tank, custom processing animals for personal use.

**NOTES**
## TEST YOUR KNOWLEDGE

### Chapter #4

Column #1 are the questions. Choose the correct answer from the choices in column #2 and write the letter in the corresponding box in column #3.

Please note, some answers are used more than once and some are not used. The answer key is located below the questions and answers upside down.

<table>
<thead>
<tr>
<th>1</th>
<th>Keeping records that show the validity of the system and the results for future use.</th>
<th>A</th>
<th>Pre-requisite</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Conducting a Hazard Analysis</td>
<td>B</td>
<td>Complex trips</td>
</tr>
<tr>
<td>3</td>
<td>Managements way of deciding how to implement Pre-requisites</td>
<td>C</td>
<td>Seven</td>
</tr>
<tr>
<td>4</td>
<td>Most often this step checks temperature</td>
<td>D</td>
<td>Monitoring</td>
</tr>
<tr>
<td>5</td>
<td>Pre-determined programs to focus on particular operational needs; for example, pest control.</td>
<td>E</td>
<td>Policies and Procedures</td>
</tr>
<tr>
<td>6</td>
<td>The number of parts to conducting a Hazard Analysis</td>
<td>F</td>
<td>Investigating the flow of food</td>
</tr>
<tr>
<td>7</td>
<td>A food product that goes through the temperature danger zone more than once</td>
<td>G</td>
<td>Documenting</td>
</tr>
</tbody>
</table>

**ANSWER KEY**

```
1G 2F 3E 4D 5A 6C 7B
```
CHAPTER 5
FACILITIES AND MAINTENANCE
• **Floors, walls and ceilings** must be made from materials that are smooth and durable. Floors need to have coving, a curved, sealed edge between the floor and wall. It aids in easy cleaning.

• **Equipment** must be installed properly and so that it is easy to maintain and clean.

• **Chemicals** used in the operation must be acceptable to local and state regulations and disposed of properly.

• **Dishwashing machines** need to have the ability to maintain proper temperature, speed and water pressure.

• **Water** must come from an approved source being a municipal water main, private tested source or water transport vehicles.

• **Plumbing** must meet current code. Indirect drains, back flow valves or air gaps must be used these devices prevent the co-mingling of contaminated sewage or water to mix with the safe water supply.

• **Grease traps** come in all shapes and sizes, and the regulations can vary from jurisdiction to jurisdiction. Know your local codes and make sure that a qualified service cleans traps and certify they are working properly.

• **Proper lighting** must be installed with adequate foot candles to illuminate. 50 foot candles for any prep area, 10 foot candles for walk-ins, storage areas and dining rooms and 20 foot candles for all other equipment and locations.

• **Proper ventilation** to remove grease, heat and steam that is properly maintained.

• Garbage dumpsters should be as far away from buildings as possible with lids, drain plugs in place and the dumpsters must be placed on asphalt or concrete. Garbage cans need tight fitting lids and kept clean inside and out.

• **Master Cleaning Schedule** assists in proper cleaning and maintenance of floors, walls, ceilings and equipment that are not normally cleaned on a daily basis. It should inform staff of when the work must be done, how it’s done, and who is responsible for doing it.

• Whenever making changes to your physical layout, or the purchasing of new equipment, its best to check with your local authority for their advice and approval.

• **Only POTABLE** water may be used in a food service operation. Potable water can come from; an approved public water supply, private water sources that are tested and certified, closed portable water containers or water transport vehicles.

• **Onsite septic systems** need regular maintenance and are properly tested.

• **Ladies rest rooms** must have a covered receptacle for sanitary napkins.
Soap (liquid preferred) Hand sanitizers are no substitute for washing, only as an additional safety layer.
Single use paper towels or an approved air dryer
Sign indicating that staff must wash their hands
Garbage can for used paper towel
Disposable gloves located in close proximity

**FACILITIES & MAINTENANCE**

Proper Installation and Maintenance of Equipment

* Use only professional licensed installers and maintenance people.
* Follow manufacturers directions for cleaning and in house maintenance.
* Check equipment daily to make sure it is working correctly.
* Set up a maintenance schedule by adding to master cleaning schedule.
* Ice machines need to installed and maintained properly. Ice is considered food. The ice scoop should have a designated location (holder) on the outside of the machine.
* Floor equipment not on wheels needs to be 6 inches off floor, table top equipment needs 4 inches so that cleaning is possible.

Floor equipment not on wheels needs to be 6 inches off floor, table top equipment needs 4 inches so that cleaning is possible.
Always follow the manufacturer’s instructions when installing, operating, and maintaining dishwashers. Hot water machines must have final rinse at 180 degrees, low temp final rinse 140 degrees and single tank hot water 165 degrees. Low temp machines sanitize with a chemical solution, usually bleach.

FACILITIES & MAINTENANCE

Garbage

Store waste and recyclables separately from food and food-contact surfaces

- Remove garbage before it becomes a problem.

Storage must not create a nuisance or a public health hazard.

- Store garbage as far from the building as possible. Garbage containers must be washed inside and outside on a regular basis. They must also be leak & pest proof.

- Outside bins must be on paved lot, with lids covered and drains closed.

Waste and recyclables must be stored separately from food and food-contact surfaces. The storage of these items must not create a nuisance or a public health hazard. Drains from dumpsters must be left in place and dumpsters should be kept as far from the building as possible with their lids closed and be atop of a solid surface like blacktop or concrete.
**FOOD VENDING MACHINES**

All products should be labeled with all required information including expiration date, or use by date. These dates should be checked daily.
Discard any food that was prepared on site within 7 days.
Keep all foods within proper temperatures; cold 41 degrees or below and hot at 135 degrees or above.
Display all TCS foods in their original packaging.
Fresh fruit with edible peels should be washed and wrapped.

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**Pest Management**

Three things to prevent pest infestation:

1. Deny pests access to the operation/ fix holes in screens, make sure they are tight fitting, doors should close properly and have sweeps on their bottoms. Cracks around plumbing and
holes in walls and floors need to be repaired and sealed. All doors leading out of the building should be self-closing.

2. Deny pests food, water and shelter/ keep floors, equipment and storage areas free of food, keep food containers tightly sealed, and check all delivers before they come inside. Fix all leaking pipes or faucets and do not leave any kind of material around that pest can use for nesting.

3. Live and/or dead insects and rodents are signs of infestation

When all else fails call in a Pest Control Operator (PCO). Do not leave pesticides in the operation, if allowed make sure they are kept stored separately from food prep and storage areas. Only a PCO can use poisonous or toxic pest control materials.
### TEST YOUR KNOWLEDGE

**Chapter #5**

Column #1 are the questions. Choose the correct answer from the choices in column #2 and write the letter in the corresponding box in column #3.

Please note, some answers are used more than once and some are not used. The answer key is located below the questions and answers upside down.

<p>| | | |</p>
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<tr>
<td><strong>1</strong></td>
<td><strong>2</strong></td>
<td><strong>3</strong></td>
</tr>
<tr>
<td>1</td>
<td>Kitchen walls and floors must be...</td>
<td>A</td>
</tr>
<tr>
<td>2</td>
<td>Connecting curved tile where the floor meets the wall</td>
<td>B</td>
</tr>
<tr>
<td>3</td>
<td>Plug must be left in, covers closed and placed on solid ground</td>
<td>C</td>
</tr>
<tr>
<td>4</td>
<td>Illumination measurement</td>
<td>D</td>
</tr>
<tr>
<td>5</td>
<td>Must have the NSF or UL approval</td>
<td>E</td>
</tr>
<tr>
<td>6</td>
<td>Must be kept at 41 degrees or lower</td>
<td>F</td>
</tr>
<tr>
<td>7</td>
<td>Safe water to drink</td>
<td>G</td>
</tr>
<tr>
<td>8</td>
<td>The space between where a sink drain ends and floor drain begins to prevent backflow</td>
<td>H</td>
</tr>
<tr>
<td>9</td>
<td>Cannot be used for defrosting foods, cleaning vegetables or washing pots</td>
<td>I</td>
</tr>
</tbody>
</table>

**ANSWER KEY**

1D 2B 3F 4A 5I 6H 7C 8E 9G
CHAPTER 6
INCIDENTS & IMMINENT DANGER
Food borne Illness Outbreak: is caused by a disease that is transmitted to people becomes an outbreak when

1. Two or more people eat the same food and become ill.
2. An investigation is conducted by the local health authorities.
3. Laboratory analysis confirms the findings.

This information is then sent to the CDC.

Why is this important?
Gathering this information and analyzing it helps to find out how the outbreak started and may help to prevent it from happening again.

- Certain crises can affect the safety of the food you serve. Common crises’ include electrical power outages, fire, flooding, and sewage backups. Local regulatory authorities consider these to be imminent health hazards. An imminent health hazard is a significant threat or danger to health that requires immediate correction or closure to prevent injury.
- Temperature control: Power failures and refrigeration breakdowns can threaten your ability to control the temperature of TCS food, which can result in the growth of pathogens.
- Physical security: Unauthorized people inside a facility are a risk to food safety. This is especially true when they can access storage and processing areas. Also, acts of nature can weaken a facility’s security.
- Drinkable (POTABLE) water supply: Threats to the drinkable water supply must also be considered. Broken water mains and breakdowns at water treatment facilities are a risk to the safety of food (SALMONELLA TYPHI). Terrorist contamination of the water supply could also be a threat.
- The operation should have a written emergency plan approved in advance by the regulatory authority.
- Immediate corrective action must take place to prevent, eliminate or control any food safety risk and imminent health hazard.
- Notify the regulatory authority before implementing your emergency plan.
• Certain crises can affect the safety of the food you serve. Common crises include electrical power outages, fire, flooding, and sewage backups. Local regulatory authorities consider these to be **imminent health hazards**. An imminent health hazard is a significant threat or danger to health that requires immediate correction or closure to prevent injury.

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• The operation should have a written emergency plan approved in advance by the regulatory authority.

• Immediate corrective action must take place to prevent, eliminate or control any food safety risk and imminent health hazard.

• Notify the regulatory authority before implementing your emergency plan.

**INCIDENTS AND IMMINENT DANGER**

How to respond to a crisis affecting the facility:

- **DOCUMENTATION** (take photos as soon as it is safe to do so)
- Determine if there is a significant risk to the safety or security of your food and/or staff.

- **If the risk is significant (IMMENENT)**
  - Stop service
  - Notify the local regulatory authority

- **Decide how to correct the problem**
  - Establish time-temperature control
  - Clean and sanitize surfaces
  - Verify water is drinkable
  - Reestablish physical security of the facility
A plan should be prepared in advance as to how you will deal with an emergency. Assemble a team of management people and decide who will do what. Someone needs to be able to speak with the authorities and the media. For a power outage, know how you are going to handle your perishable inventory, and make sure you document as much as possible including pictures. These might be very helpful afterwards with insurance and/or legal claims.

**INCIDENTS AND IMMINENT DANGER**

**Responding to a Foodborne-Illness Outbreak**

**Gather Information**
- Ask the person for general contact information.
- Ask the person to identify the food eaten.
- Ask for description of symptoms.
- Ask the person when did they first get sick.

**Notify Authorities**
- Contact the local regulatory authority if an outbreak is suspected.

*Never admit guilt over the phone.*

**DOCUMENTATION!**

An outbreak can occur anywhere at any time, even to the best of places. Any size business can prepare for the possibility of a problem. Do not try to fake and hide things. Develop a dialog early on with your local health department. Don’t be afraid to call them and ask for help. Have a prepared statement should the local press come around, appoint someone who speaks well to be the spokesperson. If there is a problem, go the extra mile to make things right. But most important; DOCUMENT everything from the beginning to the end.
The law requires that a health inspector be allowed to enter a food business at any time. They cannot be denied entry. You do have a right to ask for identification. It is suggested that a manager or at least the person who is a certified food protection manager accompany the inspector so that any questions the inspector has can be answered properly. Also, it is a good idea to take a pad and pen and make notes as the inspector goes through the inspection.

TRAINING AND MONITORING

- Train staff to follow food safety procedures
- 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
- Use Job Aids
- Correcting a situation immediately is called corrective action

Managers must set up standard operating procedures that focus on the measures listed on the slide. Then they must train their staff on these procedures and monitor them to make sure the procedures are followed. They should walk the talk and talk the talk.
TEST YOUR KNOWLEDGE

*Chapter #6*

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<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
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</thead>
<tbody>
<tr>
<td>1. Local Health Department</td>
<td>A. New definition of an outbreak</td>
<td>1</td>
</tr>
<tr>
<td>2. Imminent danger</td>
<td>B. The Center for Disease Control (CDC)</td>
<td>2</td>
</tr>
<tr>
<td>3. When presented with this, this person must be allowed to enter your business</td>
<td>C. All violations have been fixed and permission is granted by the health department</td>
<td>3</td>
</tr>
<tr>
<td>4. Possible problem associated with backup of water and/or sewage into an operation</td>
<td>D. Approves HACCP plans</td>
<td>4</td>
</tr>
<tr>
<td>5. Two or more people become sick after eating the same food at the same establishment including an inspection by the BOH and conclusive lab results</td>
<td>E. Salmonella Typhi</td>
<td>5</td>
</tr>
<tr>
<td>6. Making sure the staff is up-to-date regarding the latest food safety requirements</td>
<td>F. Health inspector with proper I.D.</td>
<td>6</td>
</tr>
<tr>
<td>7. Local health departments send reports regarding local outbreaks to</td>
<td>G. Operation closure due to public safety</td>
<td>7</td>
</tr>
<tr>
<td>8. An operation that has been closed by the health department may not reopen until</td>
<td>H. Ongoing training</td>
<td>8</td>
</tr>
</tbody>
</table>

**ANSWER KEY**

1D 2G 3F 4E 5A 6H 7B 8C
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