



Providing Safe Food

FOODBORNE ILLNESS is a disease carried or transmitted to people by food.

FOODBORNE ILLNESS **OUTBREAK** is when **two or more** people experience the same illness after eating the same food.

HIGHER RISK POPULATIONS INCLUDE: Infants, preschool age children, pregnant women, the elderly, people taking medications, and people who are seriously ill.

Although any type of food can become contaminated, some are better able to support the rapid growth of microorganisms than others. These foods require **TEMPERATURE CONTROL FOR SAFETY (TCS)**. TCS foods must be kept out of the **Danger Zone (41° - 135°)** prevent the growth of microorganisms and the production of toxins.

TCS FOODS include Milk, Eggs, Shellfish, Fish, Meats, Meat Alternatives, Untreated Garlic & Oil Mixtures, Baked Potatoes, Raw Sprouts, Cooked Rice, Cut Tomatoes, and Cut Melons.

THREE TYPES OF CONTAMINATION

- BIOLOGICAL – Bacteria, Virus, Parasites, Fungi, Natural Toxins
- CHEMICAL – Cleaners, Sanitizers, Toxic Metal from Non Food Service Grade Utensils and Cookware, Pesticides
- PHYSICAL – Foreign Objects

THE CENTER FOR DISEASE CONTROL (CDC) **TOP FIVE DOCUMENTED REASONS** FOR OUTBREAKS:

1. Purchasing food from unsafe sources
2. *Failing to cook food adequately*
3. Holding food at incorrect temperatures
4. *Contaminated equipment*
5. Poor personal hygiene

THREE WAYS FOOD BECOMES CONTAMINATED

- Time-Temperature Control TCS foods are left in the danger zone for > 4 hours
- *Cross Contamination* *Contaminants cross to a food that is not going to be cooked any further*
- Poor Personal Hygiene Food handlers cause the food borne illness

The Microworld

FOODBORNE INFECTIONS can result when a person eats food containing pathogens, which then grow in the intestines and cause illness. Typically symptoms do not appear for 1-3 days.

FOODBORNE INTOXICATIONS result when a person eats food containing toxins (poison) produced by pathogens found on the food or which are results of chemical contamination. Typically symptoms appear quickly, within a few hours.

BACTERIA are of the greatest concern. **Bacteria are found everywhere and under favorable conditions, they can reproduce very rapidly.** The acronym FATTOM stands for Food, Acidity, Temperature, Time, Oxygen and Moisture. Time & Temperature are the easiest thing for us to control.

VIRUSES are the smallest of the microbial contaminants. While a virus cannot reproduce in the food, once consumed it will cause illness. Viruses are spread from PERSON TO PERSON, PERSON TO FOOD, AND PERSON TO FOOD CONTACT SURFACES. **Practicing good personal hygiene and minimizing bare-hand contact with ready -to -eat food** can help defend against viral foodborne illnesses.

PARASITES are organisms that need a living host to survive. Proper cooking and freezing kills parasites.



FUNGI, such as molds and yeast are generally responsible for spoiling food and rarely cause illness. They can grow in almost any condition but grow well in acidic foods. Some molds, however can produce harmful toxins. Yeasts can spoil food rapidly and will produce a smell or taste of alcohol. Foods spoiled by yeast should also be discarded.

Contamination, Food Allergens, and Foodborne Illness

FISH TOXINS

- SCOMBROID – **Histamine** Toxin – **Tuna**, Mackerel, Bonito, Mahi Mahi are **time-temperature abused**.
- CIGUATERA - Ciguatoxin, **predatory reef fish** (Barracuda, Grouper, Jacks, and Snapper) - **marine algae**.
- **Purchase fish from APPROVED SUPPLIERS** since these toxins cannot be destroyed by cooking or freezing.

PRODUCE – **All produce should be purchased from an approved supplier**. This will prevent illnesses associated with wild mushrooms, and produce that has been contaminated with sewage or chemicals.

CHEMICAL CONTAMINANTS can come from a wide variety of substances including toxic metals, pesticides, cleaning products, sanitizers, and lubricants. To prevent contamination, such as lead in a pewter pitcher, **use only approved food-grade utensils & equipment** to prepare and store food. If carbonated-beverage dispensers are installed improperly, and carbonated water is allowed to flow back into the copper supply lines, it could leach copper from the line and contaminate the beverage. **Only allow a licensed professional** to apply pesticides.

PHYSICAL CONTAMINATION can occur when **foreign objects** are accidentally introduced into food. Common physical contaminants include metal shavings from cans, staples, glass from broken light bulbs, fingernails, hair, band-aids, dirt.

FOOD SECURITY addresses the prevention or elimination of the deliberate contamination of food. The key to protecting food is to make it as difficult as possible for tampering to occur by addressing all potential **HUMAN, INTERIOR and EXTERIOR** elements in your operation.

FOOD ALLERGIES. Some allergic reactions could include itching, tightening of the throat, wheezing, hives, swelling, diarrhea, vomiting, cramps, and loss of consciousness or even death. Managers and employees should be aware of the most **COMMON FOOD ALLERGIES, which include milk, dairy, eggs, shellfish, fish, wheat, soy, peanuts, and tree nuts**. You and your employees should be able to inform customers of these and other potential food allergens that may be included in food served at your establishment.

The Safe Foodhandler

FOOD HANDLERS have the potential to contaminate food when they have been diagnosed with a foodborne illness, show symptoms of a gastrointestinal, have infected lesions, or touch anything that could contaminate their hands.

PROPER HAND WASHING must always be practiced, because simple acts like nose picking, or touching one's hair can contaminate food. This is especially important before starting work, after using the restroom, after sneezing, coughing, smoking, eating, drinking, handling raw food, & handling garbage.

1. **Turn on hot water - 100F (or as hot as comfortable)**
2. Apply soap
3. Scrub hands & arms for **10-15 SECONDS**.
4. Rinse
5. Dry with a single-use towel or air dry. **TOTAL TIME: 20-30 seconds**.
6. **If an establishment uses a hand antiseptic, it must be FDA approved as a food additive**

HANDS: short, clean nails, cuts & wounds covered with clean bandages and gloves or a finger cot.

GLOVES should never be used in place of hand washing. Hands must be washed before putting on gloves and when changing to a new pair. Gloves used to handle food are for single-use and should never be washed or re-



used. They must be changed at least every **FOUR HOURS**, when they become soiled or torn, or when beginning a new task.

PERSONAL HYGIENE can be a sensitive subject with some people, but it must be addressed with every employee because it is vital to food safety. All employees must bath or shower before work and keep their hair clean. Prior to handling food, employees must put on clean clothing, appropriate shoes and a clean hair restraint or hat. They must also remove jewelry from hands and arms. **Only a plain wedding band should be allowed.** Aprons should always be removed when the employee leaves food-preparation areas. Eating, drinking, smoking, and gum chewing should not be allowed when preparing, serving or working in food-prep areas.

EMPLOYEE ILLNESS

- RESTRICT employees from working with or around food if they have a sore throat with a fever.
 - *If serving a high risk population – exclude with sore throat and fever*
- EXCLUDE employees with active JAUNDICE, DIARRHEA OR VOMITING
 - *must be symptom free for 24 hours before returning*
- NOTIFY THE HEALTH DEPARTMENT AND EXCLUDE if they are diagnosed with
 - *Salmonella, Shigella, E. Coli, Hepatitis A, or Norovirus.*

The Flow of Food

THERMOMETERS are the most important tools managers have to prevent time-temperature abuse. Thermometers should be washed, rinsed and sanitized and air-dried before each use to prevent cross contamination. They should also be **calibrated before each shift** to ensure accuracy. When measuring the internal temperatures of food, the thermometer stem or probe should be inserted into the thickest part of the product.

BIMETALLIC-STEMMED- the stem should be immersed in the product from the tip to the end of the **sensing area**. It should have an adjustable calibration nut, be easy-to-read, and accurate to within 2 degrees.

INFRARED – measure surface temperatures and can **NOT be used to take the internal temperatures**

THERMOCOUPLES are digital with different types of probes.

- *Penetration Probes - internal temperature of food, Immersion Probes - liquids, Surface Probes - surface.*

CALIBRATE - The boiling-point method requires the thermometer to be adjusted to 212F after the stem probe is placed in boiling water. The **ICE-POINT** method is when the thermometer is submerged in ice water and adjusted to **32F**.

NEVER USE GLASS THERMOMETERS TO MEASURE FOOD TEMPERATURES

Purchasing & Receiving

APPROVED SUPPLIER – Has been inspected and meets all applicable local, state, and federal laws

RECEIVING - Operators must plan their delivery schedules so products can be handled promptly and correctly. Employees assigned to receive deliveries should be trained to inspect food properly as well as to distinguish between products that are acceptable and those that are not. Packaging should be clean and undamaged, use-by-dates current, and show no signs of mishandling.

PRODUCTS MUST BE **DELIVERED AT THE PROPER TEMPERATURES.**

- Cold TCS Foods – 41F or Lower
- Live Shellfish and Shell Eggs – 45F or Lower
- Hot TCS Foods 135F or higher
- Frozen – **Frozen Solid** with no Fluid Stains or Large Ice Crystals



FIRST IN FIRST OUT (FIFO) stock rotation should be followed. Store items with earlier use by dates in front, and use them first.

Items should be stored in original packaging. If removed from its original packaging, wrap in clean moisture-proof material, or place it in a clean sanitized container with tight fitting lid. All packaging and containers should be labeled with the **NAME OF THE FOOD AND EXPIRATION DATE**.

TCS FOODS PREPARED ON SITE must be labeled - name **of the food, the date it should be sold, consumed or discarded**. It can be stored a maximum of **SEVEN DAYS** at 41F or lower before it must be discarded.

THROW OUT ALL FOOD THAT HAS PASSED THE MANUFACTURERS EXPIRATION DATE.

REFRIGERATORS must be **set at 39° or lower**. Never place hot food in refrigerators, which could raise the temperature inside. **Cool food to 70° before placing it in the refrigerator**. Do not line refrigerator shelves, overload units, or open doors too often. These practices make units work harder to maintain the temperature inside. If possible, store raw meat, poultry, and fish separately from cooked or ready-to-eat foods to prevent cross-contamination. If not, then store these items below cooked or ready-to-eat food. Product temperatures should be checked regularly. **Internal and external thermometers must be maintained**.

DRY STORAGE areas should be kept at the appropriate temperature, between **50F and 70F with a relative humidity of 50-60%**. They should be clean and well ventilated to maintain food quality. Food in dry storage should be stored at least **6 inches off the floor**. Do not store food products near chemicals or cleaning supplies since food can easily become contaminated. Open dry food items should be labeled and stored in a sealed container.

FRESH MEAT, POULTRY, FISH AND DAIRY PRODUCTS should be stored at 41F or lower. Fish and poultry can be stored on self-draining ice but must change containers regularly.

LIVE SHELLFISH should be stored in their original containers at an air temperature of 45F or below and the Shell Stock Identification Tags must be kept for **90 days from the date the last one was sold or served**.

FRESH PRODUCE should not be washed before storage because it increases the chances for mold growth.

REDUCED OXYGEN PACKAGING (ROP) food should be stored at temperatures recommended by the manufacturer. Packages should be checked for signs of contamination, including bubbling, tears, excessive liquid and slime.

Ultra High Temperature (UHT) and aseptically packaged items are shelf stable until opened, **once open store in the refrigerator at 41F** or below for a **maximum of 7 days**.

Preparation

THAW frozen food in the refrigerator, under cool running water, in a microwave oven, or as part of the cooking process.

- **NEVER THAW FOOD AT ROOM TEMPERATURE**

CONTROL TIME AND TEMPERATURE - prepare food in small batches, used pre-chilled ingredients, utensils and bowls.

EGGS AND EGG MIXTURES - Pooled eggs that are cracked open and combined in a common container should be cooked promptly or stored at 41F or below. Egg batters and breading should be prepared in small batches. High risk establishments should serve only pasteurized eggs.

PRODUCE AND FRUIT should be washed before cooking, but do **not mix different items or do multiple batches**



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COOKING can reduce the number of microorganisms in food to a safe level. To ensure that microorganisms are destroyed, food must be cooked to minimum internal temperatures. **YOU MUST KNOW THESE TO PASS THE EXAM!**

- 165° Chicken, Stuffed Meats, Stuffed Pasta, Leftovers, Food Cooked in the Microwave
- 155° *Ground Meat, Injected Meat, Eggs to be held*
- 145° Steak, Chops, Fish, Roasts, Eggs short order
- 135° *Commercially Processed RTE, Vegetables, Fruit, Pasta, Beans*

TWO STAGE COOLING:

Cool from 135F to 70F in 2 hours and then from 70F to 41F in 4 hours, for a total cooling time of 6 hours.

- Reduce in size or increase surface area to allow them to cool faster. Cut pieces of food in smaller ones or break down batches of food into smaller containers or shallow pans.
- Use an ice-water bath, stir food with an ice-paddle, add ice water as a final ingredient, or use a blast chiller.
- Once food is chilled to at least **70F**, it can be stored on the top shelves in the refrigerator.

REHEATING: Leftover TCS foods must be reheated to an internal temperature of **165F within two hours**

Service

HOLDING FOODS - **Check the internal temperature of food being held at least every four hours** and discard it if it is not at the proper temperature. (Check temperatures every 2 hours if you want to have room for corrective action.)

- Hot Holding – 135F or higher
- Cold Holding – 41F or lower

HOLDING WITHOUT TEMPERATURE CONTROL – Foods must be labeled with the time removed and discard time.

- **Hot food can be held a maximum of four hours.**
- Cold food must be held 41F or below prior to being removed, it must never reach above 70F once removed and it must be labeled when it was removed and when it is to be discarded which can be a **maximum of six hours.**

GLASSWARE AND DISHES should be held at the base or from underneath, and not be stacked when serving. FLATWARE AND UTENSILS should be stored handles up.

RESERVING – Only un-opened individually packaged condiments are okay to re-serve. Plate garnish, breads or open dishes of condiments can never be served to a new guest.

SELF SERVICE BARS - **Never allow customers to re-use soiled or dirty plates.** Protect food in food bars and buffets with sneeze guards and make sure equipment can hold food at the proper temperature. Keep raw foods away from ready-to-eat or cooked foods and label all food items.

OFF SITE SERVICE - Delivery equipment must be insulated to keep food at 135F if hot food, or 41F if for cold food. Vehicles must be clean; food must be labeled with storage, shelf life and reheating instructions.

VENDING MACHINES – TCS foods must be dispensed in original containers, machine must be equipped with automatic shut-off if power is interrupted, fruits with edible peels must be washed and wrapped.

Food Safety Management Systems

PREREQUISITE PROGRAMS for personal hygiene, facility design, supplier selection, sanitation and pest control, equipment maintenance, and food safety training must be in place before attempting either of the food safety management systems



ACTIVE MANAGERIAL CONTROL. This approach focuses on controlling the five most common risk factors responsible for foodborne illness identified by the CDC. These include purchasing from unsafe sources, failing to cook adequately, holding food at improper temperatures, using contaminated equipment, and practicing poor personal hygiene.

1. First you must consider the five risk factors as they apply throughout the flow of food
2. *Identify any issues in your operation that could impact food safety*
3. Develop policies and procedures that address any issues that were identified
4. *Monitoring to determine if your new policies are being followed*
5. Verify that the policies and procedures you have established are actually working

HAZARD ANALYSIS CRITICAL CONTROL POINT (HACCP) system focuses on identifying specific points where it is essential to prevent eliminate or reduce biological, chemical, or physical hazards to a safe level.

1. **CONDUCT A HAZARD ANALYSIS**
2. *Determine the critical control points where the hazards can be prevented, eliminated or reduced to safe levels*
3. Determine and establish maximum and minimum limits that must be met for each Critical Control Point (CCP)
4. *Determine and establish monitoring procedures*
5. **Identify what corrective actions will be taken when critical limits have not been met**
6. *Verify that your plan is working*
7. Establish procedures for record keeping and documentation

FOODBORNE-ILLNESS OUTBREAK: The key is to start with a written plan that identifies the resources required and procedures to handle the crisis. When receiving customer complaints, listen carefully, express concern and be sincere. **Do not admit responsibility**, but promise to investigate and respond. With legal advice, consider developing an incident report to guide you through the process. Call your crisis-management team together and implement your plan.

Sanitary Facilities and Equipment

FLOORING should be strong, durable and easy to clean. It should also be non-absorbent, resist wear and help prevent slips especially in walk-ins, food prep areas, dishwashing areas, restrooms and others areas subject to moisture or spray cleaning. Carpeting is not recommended in high-soil areas but is popular in dining rooms because it absorbs sounds.

COVING is a curved, sealed edge placed between the floor and the wall and is used to eliminate sharp corners or gaps or cracks between the floor and the wall that would make it impossible to clean.

RESTROOMS / HANDWASHING STATIONS: Restrooms should be cleaned regularly and have a fully equipped hand washing station with **hot & cold water**, soap, a means to dry hands, a waste container, signage indicating employees hand washing requirements before returning to work.

FOOD SERVICE GRADE EQUIPMENT is important to purchase equipment that has been designed with sanitation in mind and acceptable for use in a restaurant such as **NSF International and Underwriters Laboratories (UL)**.

STATIONARY EQUIPMENT must be mounted on legs at least **six inches off the floor, or it must be sealed to a masonry base**. Stationary tabletop equipment should be mounted on legs with a clearance of four inches between the tabletop and the equipment or it should be sealed to the tabletop.

POTABLE WATER-water safe to drink-is vital in an establishment. Sources include public water mains, private water sources that are tested at least once a year, and bottled drinking water. In a water emergency, an establishment might be allowed to remain open if certain precautions are followed. These could include boiling water or purchasing water, boiling water for hand washing and essential tasks.



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PLUMBING - Only licensed plumbers should install and maintain plumbing systems. The greatest challenge to water safety comes from cross-connections—a physical link through which contaminants from drains, sewers, and other wastewater sources can flow into the potable-water supply. **Vacuum breakers and air gaps can be used to prevent backflow.**

LIGHTING intensity is measured in foot candles

- **50 foot-candles – food prep area**
- 20 foot-candles - hand washing, buffet, restrooms, wait stations and display areas
- 10 foot-candles are used inside walk-in refrigerators, dry storage areas, and dining rooms
- **SHATTER-RESISTANT BULBS AND PROTECTIVE COVERS** prevent broken glass from contaminating food

ADEQUATE VENTILATION improves the indoor air quality by removing smoke, grease, steam and heat. **If there is adequate ventilation, there will be no buildup of grease and condensation on walls and ceilings.** Ventilation must be designed so hoods, fans, guards, and ductwork do not drip onto food or equipment. Hood filters and grease extractors must be cleaned regularly.

GARBAGE CONTAINERS must be leak proof, water proof, pest proof, easy to clean, and durable. They must have tight-fitting lids and must be kept covered when not in use. All garbage containers should be frequently cleaned thoroughly both inside and out. Garbage should be removed from food-preparation areas as soon as possible, and **must not be carried across a food-preparation area.**

Cleaning and Sanitizing

CLEANING is the process of removing food and other types of soil from a surface.

SANITIZING is the process of **reducing the number of harmful microorganisms** from a clean surface to safe levels. You must clean and rinse a surface before you sanitize. Chemical sanitizers are influenced by **contact time, concentration of the sanitizer, and temperature** of the solution. Test the solution regularly with a sanitizer test kit.

FOOD-CONTACT SURFACES must be cleaned and sanitized after each use, whenever you begin working with another food type, any time a task is interrupted, and at four-hour intervals if in constant use.

- **It is a 3 step process – Wash, Rinse, Sanitize, Air Dry.**

DISHWASHING MACHINES - Follow manufacturer's guidelines and make sure your machine is clean and in good working condition. Check the temperature and pressure of wash and rinse cycles daily. Information should be posted on the machine regarding proper water temperature, conveyor speed, water pressure and chemical concentration.

THREE-COMPARTMENT SINK - Items cleaned in the three compartment sink should be pre-soaked or scrapped clean, washed in detergent with 110F water, rinsed in clean water, and sanitized in either **hot water at least 171F or a chemical-sanitizing solution.** All items should be **air-dried inverted.**

CLEANING TOOLS AND CHEMICALS should be placed in a storage area away from food and food-preparation areas. Make sure chemicals are clearly labeled if removed from the original container. **Keep Material Safety Data Sheets (MSDS) for each chemical** in a location to all employees on the job. These sheets have important first aid information, and information about safe use. Dispose of chemicals according to the instructions on the label and local regulations.

A MASTER CLEANING SCHEDULE lists all cleaning tasks, as well as when and how tasks should be completed. Assign responsibility to each task by job title. Create employee support by including their input into the program design and rewarding good performance. Monitor the cleaning program to keep it effective.



Integrated Pest Management (IPM)

- DENY PEST ACCESS
- DENY PESTS FOOD, SHELTER AND WATER
- WORK WITH A LICENSED PEST CONTROL OPERATOR (PCO) to eliminate any pests that enter.

ROACHES like dark, warm moist places. Check for a strong oily smell, **droppings look like grains of black pepper**, and capsule egg cases.

RODENTS are also a serious health hazard. A building can be infested with both rats and mice at the same time. Look for droppings, signs of gnawing, tracks, nesting materials and holes.

FLIES can carry Shigellosis and typhoid fever.

PESTICIDES are hazardous materials. Anytime they are used or stored on your premises, you **must have a corresponding MSDS**. To minimize the hazard to people, have your PCO use pesticides when you are closed and your employees are not on site. Be sure to wash rinse and sanitize food contact surfaces after a treatment.

Food Safety Regulations

GOVERNMENT CONTROL regarding food safety in the United States is exercised at three levels: federal, state and local. The FDA in the form of the FDA Food Code issues recommendations for restaurant and food service regulations at the federal level. Regulations are written at the state level and enforcement is usually carried out at the state and local levels.

DURING THE INSPECTION, **ask for identification**, cooperate with the health inspector and keep the relationship professional. Accompany him during the inspection. When the inspector points out a problem, take notes. If a deficiency can be corrected immediately, do so. Be prepared to provide records that are requested, discuss violations and time frames and then follow up! Closure could result from significant lack of refrigeration, backup of sewage, significant infestation, and a food-borne illness outbreak or fire or flood emergency.

Employee Food Safety Training

As a manager, it is your responsibility to ensure that employees have the knowledge and skills needed to handle food safely in your establishment. Some of the benefits can include preventing a foodborne illness outbreak, preventing loss of revenue and reputation following an outbreak, improving employee morale, and increasing customer satisfaction.

ASSESS THE TRAINING NEEDS IN YOUR ESTABLISHMENT. A training need is a gap between what employees is required to know to perform their job and what they actually know. To identify food safety training needs you can test your employees' knowledge, observe their performance, or question them to identify areas of weakness.

All employees require general food safety knowledge. Other knowledge will be specific to the tasks required to perform their job. **From their first day, employees should receive training on the importance of food safety, proper personal hygiene, and safe food preparation practices**. They should also receive training on proper cleaning and sanitizing, safe chemical handling and pest prevention.

Regardless of their position, employees need to be retrained periodically. This can be accomplished by scheduling short training sessions, holding shift meetings to update employees on new procedures, or conducting motivational sessions that reinforce food safety practices. Keep records of all training conducted at your establishment. For legal reasons, it is important to document that employees have completed food safety training.

Are You Ready?

- Do you know the Temperature Danger Zone?
- **Did you memorize all of the cooking temperatures?**
- Do you know the three ways that food can become contaminated?