

A. DELI FOOD SAFETY & SANITATION

The U.S. manufacturers have a vested interest in helping you handle deli foods properly. Today, deli operators and consumers alike rate food safety as one of their top concerns. Food safety mishaps can be costly, and damaging to your company's reputation.

Your customers trust you to sell them fresh and safe products, and part of your job is to ensure that all products are properly handled. This is necessary to maintain your department's image, and sell the highest quality products. Every employee in the deli department must do his/her part to ensure that foods are received, stored, prepared, and handled in a clean and safe environment.

In this section, we will discuss several important areas related to food safety and sanitation in the deli, and give you some guidelines for addressing them in your deli department. We will also detail methods you can use to prevent food borne illnesses through careful food handling and sanitation practices. In addition to ensuring food safety, handling food products properly will also minimize product shrink, improve product shelf-life and increase your deli's profitability.

A. Deli Food Safety & Sanitation

B. Deli Product Care & Handling

C. Food Borne Illnesses



1. EFFECTS OF BACTERIA ON FOOD QUALITY

What are Bacteria? Bacteria are microorganisms that are so small they can't be seen with the naked eye. These microbes are found everywhere...in the air, soil, water, on the skin, fruit and vegetable peelings, food processing equipment, utensils, and even on the clothing of people who handle food.

How Do Bacteria Affect Product Quality? Many bacteria are beneficial and responsible for the taste and texture of many foods we enjoy like yogurt, cheese, sausages, etc. Other harmful bacteria are known as pathogens and cause food to spoil. These harmful bacteria can cause illnesses known as food borne illnesses that can make people very sick or even kill them. Generally these illnesses are caused when harmful bacteria have contaminated food. There is another group of bacteria that cause food spoilage but they are generally not harmful if consumed. Usually the presence of these bacteria in large numbers will cause the food to begin spoiling and not be pleasing to the consumer. This is Mother Nature's way of telling consumers to be cautious about consuming a food as it may also have harmful or pathogenic bacteria. Once food bacteria begin to multiply, they can affect food quality in several ways:

1.	They break down or degrade the food (like unwanted mold on cheese, discoloration or slimy coating on meats)
2.	Shelf-life of the product is shortened
3.	Product freshness and appearance deteriorate
4.	They produce spoilage or substances like toxins that can cause illnesses



Perishable Foods Foods are often grouped into three classes based on how quickly they spoil. They include stable or non-perishable foods, semi-perishable foods, and perishable or potentially hazardous foods. Most deli foods are considered to be perishable or potentially hazardous foods.

Potentially Hazardous Foods This group of foods includes meat, poultry, fish, eggs, many fruits and vegetables, and most all cooked foods. These foods tend to spoil easily and are possible sources of contamination. Potentially hazardous foods are any food or food ingredient, natural or synthetic that is capable of supporting:

- ▶ **The rapid and progressive growth of infectious or toxigenic microorganisms (salmonella, listeria, E. coli, staphylococcus, etc)**
- ▶ **The slower growth of clostridium botulinum (botulism)**

Most Deli Foods are Perishable Even with the modern conveniences of refrigeration and freezing, good transportation, storage and distribution systems, foods continuously change. Some of these changes can affect product quality (deterioration) and lead to product spoilage which translates into lost revenue. This is why careful food handling during distribution as well as good stock rotation at warehouse, on supermarket shelves, and in deli departments is so vital. The key causes of food deterioration are affected by:

- ▶ **Microorganisms**
- ▶ **Time**
- ▶ **Temperature**
- ▶ **Moisture or dryness**
- ▶ **Air**
- ▶ **Light**
- ▶ **Insects, parasites or rodents**



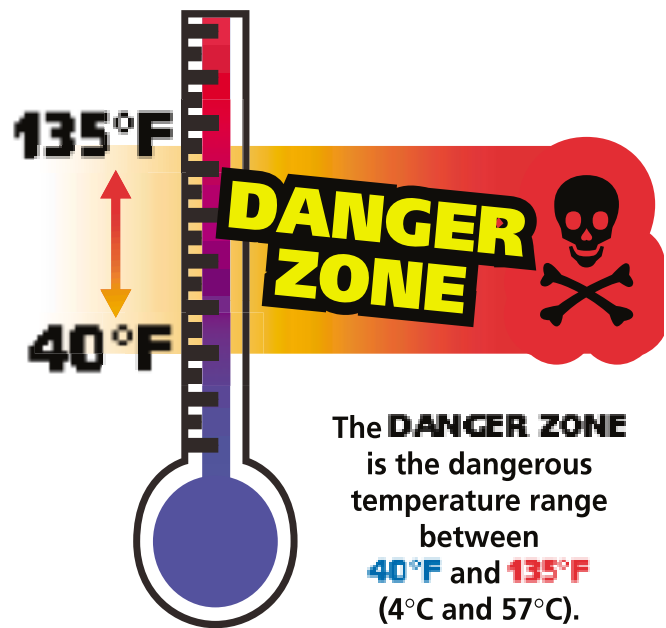
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Microbiology The way bacteria spoils food can be witnessed when a meat item is stored at room temperature (70°F or 21°C). After a day or more, the meat gets slimy, develops off odors and discolors. All these quality defects are the result of bacteria growing quickly by spending too much time in the Danger Zone.

Temperature and Time Affect Bacterial Growth Bacteria grow quickly under certain conditions, especially temperatures in the Danger Zone. **The Danger Zone is the dangerous temperature range between 40°F and 135°F (4°C and 57°C).** If food is held in this temperature range for a very long time, dangerous food microorganisms can multiply quickly.

Temperature Controls Bacterial Growth

Bacteria grow slowly or not at all at temperatures 40°F (4°C) or below and are killed above 135°F (57°C). When certain types of bacteria have time to grow, they may produce a toxin or poison that can cause illnesses. The longer foods are left in the Danger Zone, the better the chance bacteria will produce these types of toxins and poisons. If this happens, heating the product above 135°F (57°C) may not eliminate the toxin present in those foods.



Bacteria multiply quickly anytime food is abused and improperly handled. Keeping foods out of the Danger Zone is one of the most effective ways to slow bacterial growth.



Food Contamination Food can be contaminated in many ways in the deli. Some of the most frequent ways bacterial contamination takes place are:

- ▶ **Improper chilling or refrigeration of cold foods**
- ▶ **Improper holding of hot foods**
- ▶ **Inadequate reheating**
- ▶ **Contaminated utensils and equipment**
- ▶ **Cross-contamination**
- ▶ **Poor personal hygiene**
- ▶ **Purchasing food from unsafe sources**

Proper purchasing, care and handling of deli products can minimize and/or eliminate these problems. Good sanitation practices slow bacterial growth, and your actions can help prevent food borne illnesses.

Keep Things Clean Remember, bacteria collect on everything: slicers, counters, knives, spoons, cutting boards, pans, sinks, floors, walls, racks, shelving, employee clothing and aprons, hands and lots more. The best way to avoid bacterial growth or contamination is to keep everything that comes into contact with food clean and sanitized throughout the day.

Cross-Contamination Cross-contamination is when the harmful bacteria from one food contaminate another food. This can be caused either by the products coming in direct contact with each other or by equipment being exposed first to one product, then another.



2. PERSONAL HYGIENE PRACTICES

People are the chief source of food contamination. In fact, about 95% of food contamination is employee related. The remaining 5% is caused by sanitation failures. To keep food quality high and to minimize transmitting diseases to consumers, deli employees must practice exceptionally good personal hygiene. You can maintain high cleanliness standards if you concentrate on the following proper personal hygiene procedures related to:

- ▶ Hands
- ▶ Gloves
- ▶ Clothing & Aprons
- ▶ Hair Restraint
- ▶ Smoking, Eating or Drinking
- ▶ Handling Money
- ▶ Illness



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Let's cover each of these in greater detail. Some of the guidelines that follow may or may not be your store's policy. Be sure to read, understand and follow your store's policy standards. If you are unsure about any policies, ask your deli manager.

Hands **Unwashed hands can carry up to 15 million germs.** Since hands come in contact with so many things, they are a major source of food contamination. Our hands are also a perfect breeding ground for bacteria and germs because they are always in the "Danger Zone" temperature range. As a deli food handler, you must wash your hands frequently to protect your customers. Whenever your hands come in contact with a possible source of contamination, you should wash them. The following table features some guidelines.



WASH YOUR HANDS
Before you start your work in the deli
After going to the bathroom
After returning to work from a break or meal
After handling dirty utensils
After using a handkerchief or sneezing
After touching your hair, eyes, face or mouth
Before and after handling raw foods to avoid cross-contamination with cooked and ready-to-eat products
After smoking, eating or drinking
After emptying the garbage
As often as is necessary to keep them clean as you work

PROPER HAND WASHING
Use soap or a designated hand sanitizing solution, and warm water. Any time you use sanitizers for hand washing, be sure they are approved for hand washing.
Lather, scrub, and rinse for at least 20 seconds
Dry hands with a clean disposable cloth
Employees should also keep their fingernails trimmed and clean

Hand Sanitizers Hand sanitizing stations are now available that require no running water. They are cost effective, easy to use, and very effective in helping employees maintain proper hand sanitation.



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Remove Jewelry Most jewelry should be removed prior to going on shift. Jewelry worn on the hands, ears and around the neck can be another potential source of food contamination. Jewelry is not only difficult to keep clean, but pieces of it could fall off and contaminate food. In the U.S., the Food and Drug Administration (FDA) prohibits food employees from wearing jewelry on their arms and hands while preparing food. Plain wedding bands are exempt. Food employees should also keep their fingernails trimmed, filed and maintained so the edges and surfaces are cleanable and not rough. Unless wearing intact gloves in good repair, a food employee should not wear fingernail polish or artificial fingernails when working with exposed food. If you have any questions, check with your manager.

Wear Gloves If gloves are used appropriately, they can help minimize food contamination. Whenever you are preparing or serving food, you should wear gloves. But remember, wearing gloves is **NOT** a substitute for hand washing. Your frequency and circumstances for washing hands should not change just because you are wearing gloves. Gloves are just another way to positively fight the spreading of germs! Below are some guidelines:



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GUIDELINES FOR WEARING GLOVES

Always wear gloves during all food preparation and food handling

Always change gloves when you change from one type of food preparation to another (it is imperative to change gloves between handling raw and ready to eat foods)

Always wear gloves when you serve a customer and change them before you serve another

Always wear clean gloves to cover up an open cut on the hand or when wearing a bandage

Always change gloves if you have been working with any chemicals



Clothing & Aprons Other sources of unwanted bacteria are soiled clothing and aprons. To keep uniforms and your clothes clean, don't wipe your hands on them. Every time you wipe clean hands on soiled clothing, you are re-contaminating them with bacteria. Instead, wipe your hands with disposable or clean cloth towels provided by your deli department. If your apron becomes soiled, put it in the laundry receptacle provided by your department and put on a clean apron. Remember, the customer is always watching, and a dirty apron does not present a good image for your deli.

Hair Restraint In addition to clothing, falling hair can also be a direct or indirect source of food contamination. Deli employees should restrain their hair (especially tied back if it is long) and ALWAYS wear a hat and/or a hairnet for food safety. On average a person loses about 80 hairs a day, so hair restraint is important. Consumers are particularly sensitive to finding hair in their food. It only takes one hair to make a customer unhappy.

Smoking, Eating or Drinking Never smoke, eat or drink beverages while you are working on the department floor. In all these circumstances you are constantly touching your mouth, which is filled with bacteria. These bacteria spread to your hands, which you then transmit to food. Deli employees must consume food, drink beverages, smoke cigarettes or use chewing tobacco only in designated areas and then wash their hands before they return to the department.

Handling Money Although money is not a good medium for bacterial growth, consumers perceive money to be dirty. Therefore, it is advisable for one person to serve the customer and another to handle money. If you do handle money, take your gloves off, handle the money, wash your hands, and put on a new pair of gloves.

Illness Contact your deli manager and stay home if you are ill. Some illnesses may be transmitted through food. If you have any of the following medical conditions then you should not be directly handling food: diarrhea, fever, vomiting, jaundice, abdominal pain or discomfort and prolonged loss of appetite.



3. PROPER SANITATION PROCEDURES

Basic sanitary guidelines need to be followed in the deli department for food handling.



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BASIC SANITARY GUIDELINES

Raw and cooked foods should be kept apart. Use separate preparation areas (including sinks) for raw products like uncooked meat, poultry and seafood, and cooked or ready-to-eat foods. You should also have separate freezers and coolers. If you must store raw products in the same coolers and freezers, then you should store raw products well away from the prepared foods.

Raw vegetables should be washed thoroughly.

All food should be covered while in storage.

Raw foods should be kept in separate containers that are well covered or have tight fitting lids.

Never store raw products on a shelf over prepared foods.

All surfaces that come in contact with foods including counters, work surfaces, and cutting boards must be easy to clean and nonporous, meaning the surface will not absorb liquids. For example, plastic cutting boards are nonporous and will not absorb liquids. Wood cutting boards or open grain wood surfaces are porous and can retain bacteria that can cross-contaminate other foods.

Pans, slicers, utensils and cutting boards must be cleansed and sanitized (and ideally air-dried) after all product preparations.

Work areas like floors, sinks, trash containers, walls and ceilings should have specific cleaning schedules. (See your standard operating procedures for guidelines.)

Clean up as you go along. It is no different than picking up after yourself at home.

Don't prepare or serve foods with your bare hands. Hands should never come in direct contact with food. Either use utensils or gloves.

Make good personal hygiene a top priority.

Make sure you follow your store's policy and the manufacturer's guidelines for equipment and food storage temperature checks.

Keep refrigerators and freezers in good repair and have them inspected regularly.



Equipment & Utensils Equipment, utensils, and small wares need to be kept clean and sanitary at all times. Unclean equipment or utensils can easily contaminate the foods you handle with them.

Here are some guidelines for cleaning and sanitizing them in your operation.

SLICERS

- ▶ **Wipe your slicer(s) (always wearing your safety glove) between uses with a sanitized cloth;** preferably one that is disposable. Remember cloths and sponges are perfect breeding grounds for bacteria and germs.
- ▶ **To clean your slicer(s), use a four-step process:**
 - a. Dry cleaning by removing the large particle of food
 - b. Wash with a detergent and hot water
 - c. Rinse with clean water
 - d. Sanitize with hot water or a sanitizing solution and air-dry
- ▶ **Cleaning frequency should be determined by your manager, the manufacturer's instructions and your training guide.**



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PANS, UTENSILS & SMALL WARES

- ▶ **Sanitize after each use and at the end of the day to avoid cross-contamination.**
- ▶ **Use the same four-step process described above for cleaning, sanitizing and drying.**



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COUNTERS & WORK SURFACES

- ▶ **Clean up spills immediately.**
- ▶ **Keep sanitizing solution (clearly labeled) on hand at all times for sanitizing counters and surfaces.**
- ▶ **Wash and sanitize counters after each use and at the end of the day to avoid cross-contamination.**



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DISPLAY CASES

- ▶ Clean the glass daily as often as necessary. When cleaning the glass, don't spray the chemicals over the foods. Wet your cloth, then wipe the glass.
- ▶ Clean all product cases according to the manufacturer's or store policy guidelines.
- ▶ Be careful not to stock product over caseload limits. Excessive stocking can either cover up the ventilating system or cause the compressors on the case to work beyond their standards to keep the product cooled at safe display temperatures.



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FLOORS

- ▶ Sweep up litter throughout the day.
- ▶ Clean up spills immediately.
- ▶ Clean and sanitize as you work throughout the day and at the end of each day.



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Ovens, Rotisseries & Microwaves Clean and sanitize daily the food contact surfaces of cooking devices and the cavities and door seals of microwave ovens according to the manufacturer's guidelines or store policy.

Deep Fat Fryers Clean and sanitize weekly, when changing the oil, or more often according to manufacturer's guidelines or store policy.



Coolers, Freezers & Other Equipment Bacteria accumulate in coolers and freezers. Follow designated cleaning schedule.

For further information on cleaning see Cleaning Frequency Recommendations on the following page. These are sanitation and food safety procedures approved by the Food and Drug Administration and the Association of Food and Drug Officials and published in the Retail Food Store Sanitation Code.

4. PROPER USE OF CLEANERS AND CHEMICALS

In order to keep your deli a sanitary environment, you will have to use cleaners and chemicals. When you are using chemicals, always follow the manufacturer's handling instructions.

Handling & Using Chemicals You can't be too careful with chemicals. Always adhere to the following guidelines when handling or using chemicals:

1.	Always read and follow the label directions carefully and accurately. If chemicals are used for the wrong purpose or in excessive amounts, they can cause illness and sometimes death.
2.	Always store chemicals and solutions properly labeled.
3.	Always store chemicals away from food preparation, storage areas, and food contact surfaces. Take care when using any chemicals.
4.	Never spray glass cleaners directly over food. For instance, if you are cleaning the inside glass of a case, step away from the case, spray your clean cloth and then wipe the inside surface of the glass with the dampened cloth.



Cleaning Frequency Recommendations Here are the Food and Drug Administration Guidelines regarding cleaning and sanitizing of equipment, surfaces and utensils that come in contact with food:

Surfaces of equipment that come into contact with food should look and feel clean and be washed, rinsed, sanitized, and air-dried before each use.

Surfaces of cooking equipment and pans that come into contact with food must be kept free of encrusted grease deposits and other soil accumulations.

Surfaces of equipment, which do not come into contact with food, must also be kept free of dust, dirt, food residue and other debris.

Equipment, utensils and surfaces that come into contact with food must be cleaned:

- ▶ Before each use with a different type of raw animal-derived food, such as beef, fish, lamb, pork, or poultry.
- ▶ When changing from working with raw foods to ready-to-eat foods.
- ▶ Between uses with raw fruits or vegetables and with potentially hazardous foods like raw meats.
- ▶ After any time during the operation when contamination may have occurred. Occasionally work surfaces may become contaminated from sources other than food (i.e. condensation, equipment lubricants, etc.).

If working with potentially hazardous foods, equipment, utensils, and surfaces that come into contact with these foods must be cleaned every four hours.

Food-temperature measuring devices should be cleaned after using or before storing.

Equipment, utensils and surfaces that come into contact with food can be cleaned less frequently than every four hours if:

- ▶ Containers of potentially hazardous food and their contents are maintained at temperatures below 40°F (4°C) or above 135°F (57°C), and
- ▶ The containers, utensils, or surfaces are cleaned when they are empty.

The surfaces of cooking equipment that come into contact with food must be:

- ▶ Cleaned at least every 24 hours (except hot oil cooking and filtering equipment, which has a different cleaning schedule), and
- ▶ Cavities and door seals of microwave ovens must be cleaned at least every 24 hours by using the manufacturer's recommended procedures.

If the surfaces do not come into contact with food, they must be cleaned often enough to prevent a build-up of soil residues.

Source: FDA Food Code 1999, U.S. Department of Health & Human Services, Public Health Services, Food and Drug Administration, and the FDA Retail Food Protection Branch.

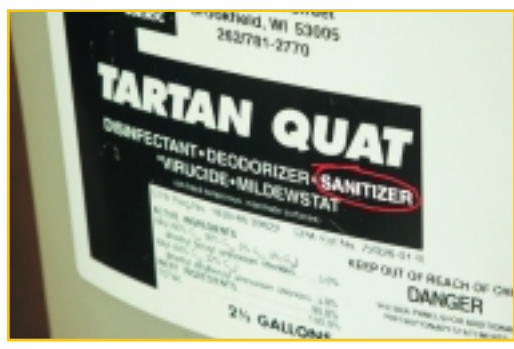


5. SANITIZING SOLUTIONS

Sanitizers are typically purchased ready to use by diluting to the appropriate strength with water. Always follow your department's policies on what are acceptable sanitizing agents. If you're working with a manufacturer's chemicals, do two things:

- ▶ Use the agent only according to the manufacturer's labeling instructions
- ▶ Make sure the label states its use as a sanitizer

Sanitizing Baths/FDA Standards One of the primary solutions you should be using is a sanitizing bath. If you are preparing your own sanitizing solutions, here are guidelines to codes provided by the Food and Drug Administration. The food-contact surfaces of all equipment and utensils shall be sanitized by:



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1.	Immersion for at least 1/2 a minute in clean, hot water with a temperature of at least 171°F (77°C); or
2.	Immersion for at least 1 minute in a clean chlorine solution containing at least 50 mg/l of chlorine, and having a temperature of at least 100°F (38°C), and a pH of 10 or less; or
3.	Immersion for at least 1 minute in iodine solution containing at least 12.5 mg/l (and not more than 25 mg/l) of available iodine, with a pH at 5.0 or less or a pH no higher than the level for which the manufacturer specifies the solution is effective, and at a temperature of at least 75°F (24°C).

Source: FDA Food Code 1999, U.S. Department of Health and Human Services, Public Health Services, Food and Drug Administration, and the FDA Retail Protection Branch.

Note: There are several other less common sanitizing methods that can be found in the FDA Food Code 1999.



B. DELI PRODUCT CARE & HANDLING

1. RECEIVING AND STORAGE GUIDELINES

RECEIVING GUIDELINES

Quality control starts the minute a delivery arrives at your store. Some of the things to watch for when products are delivered include:

- ▶ **Look for visible damage.** All products should be in good condition when they arrive. Watch for signs of damage like: crushed or broken cases, cases that are jumbled on the pallet, products that are opened or leaking.
- ▶ **Be aware of product temperature.** Frozen or chilled products must be delivered at the right temperature to maintain their quality. Check incoming products to see that chilled foods are cold and frozen foods are still frozen. When chilled foods are warm to the touch, or frozen foods have begun to thaw, check with your manager before accepting the products.



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STORAGE GUIDELINES

When putting products away after delivery, remember to:

- ▶ **Store cold foods right away.** To keep their quality, perishable products must be stored in the cooler or freezer as soon as possible. As soon as products are accepted for delivery, sort them and get them into the refrigerator or freezer. Try to have all delivered products sorted and properly stored 10-15 minutes after they have arrived.
- ▶ **Use the first-in/first-out (FIFO) method of stocking.** When putting products away, place all new products behind existing stock, making sure that older items are used before new ones are opened. As you rotate the stock, check for products that are close to their expiration dates. If you end up with a large inventory of products that are close to their expiration date, consider promoting the product in store, or using it in daily specials for prepared foods like sandwiches.



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- ▶ **Never store raw foods over cooked foods.** Drippings from raw foods can contaminate cooked products.
- ▶ **Keep raw foods covered or wrapped.** Keep raw foods well covered or in containers with tight fitting lids. This prevents bacteria from cross-contaminating other foods through air flow or direct contact with other foods.
- ▶ **Check the temperature of the cooler and freezer.** As you stock the cooler and freezer, always check the thermometers. Make sure the temperatures are at the right settings. Alert your manager if the cooler reaches over 40°F (4°C) or the freezer gets above 32°F (0°C). Temperatures for storage coolers, freezers, and deli cases should be checked daily.

2. PREPARING AND HANDLING COLD AND HOT FOODS

Handling products correctly prevents contamination and illness. The procedures you use when handling deli foods are some of the most important in preventing contamination and illnesses.

To prepare foods properly, always:

- ▶ **Handle meats and cheeses separately.** Cheese is a living product. The same bacteria that cause cheese to age can cause meats to develop “off” flavors. To prevent contamination, slice meats and cheeses on separate slicers.
- ▶ **Handle raw and cooked foods separately.** Raw foods have high numbers of bacteria. Some bacteria in raw foods can contaminate cooked food and cause illness. This is called cross-contamination. To prevent cross-contamination:
 - Wash hands thoroughly before handling each type of food.
 - Clean and sanitize surfaces before preparing raw or cooked food.
 - Do not store raw products over cooked products. Juices from raw foods can drip into cooked foods and cause contamination and serious illness.
- ▶ **Don't mix fresh products with older products on display.** The shelf-life of older products is shorter due to exposure to light and air. Mixing products can cause



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the fresh product to taste “old”. To solve the problem, place any remaining product in a smaller package or individual serving containers until the product’s “pull” date.

- ▶ **Be aware of the *Danger Zone*.** The Danger Zone is the temperature range between 40°F (4°C) and 135°F (57°C), where harmful bacteria multiply quickly in foods. Below 40°F (4°C) and above 135°F (57°C), bacteria grow very slowly or not at all. Harmful bacteria are what cause illness in humans.
- ▶ **Keep cold foods *cold*.** Chill cold foods to below 40°F (4°C). Check the temperature of cold foods on display every two hours or as required by policy. Re-chill any cold product that reaches more than 40°F (4°C).
- ▶ **Keep hot foods *hot*.** Cook foods to the recommended temperature during preparation. Hold hot foods at a minimum of 135°F (57°C) or higher. Check the temperature of hot foods on display every two hours or as required by policy. Listed below are the optimum safe temperatures for holding hot foods.

FOOD STORAGE/HOT HOLDING TEMPERATURES	
AREA	TEMPERATURE
Storage Freezer	≤ 0°F (-18°C)
Refrigerator	30°F to 40°F (-1°C to 4°C)
Refrigerated Display Case	30°F to 40°F (-1°C to 4°C)
Hot Holding Temperature for Cooked Meat Dishes	≥ 135°F (57°C)

Following these steps will ensure that your department and your products are of the highest quality – clean, fresh, and safe. To your customers, cleanliness and freshness are the most important reasons they shop your department. They determine what *quality* is in your customers’ mind. And quality is the foundation of superior service.



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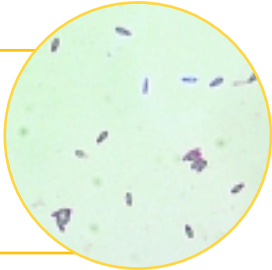


C. FOOD BORNE ILLNESSES


Detailed below are the symptoms, causes, and prevention steps, for the most common forms of food borne illness and food poisoning. Look closely at the causes of these food borne illnesses, and take notice of the things you can do to prevent their occurrences in your operation.

**TYPES OF FOOD POISONING:
SYMPTOMS, CAUSES AND PREVENTION**

Clostridium Botulinum (Botulism)

Symptoms:	Fatigue, dizziness, double vision, throat constriction, coated tongue, lower than normal body temperature, respiration and heart rate. Symptoms appear within 8 to 36 hours. Usually fatal. Death will occur within 3-6 days.	
Causes:	Eating improperly canned or packaged meats and improperly canned low acid vegetables or food products that are improperly packaged in a vacuum. Contamination can also occur in improperly stored meat, meat by-products, poultry, poultry by-products and food such as fish eggs, smoked fish and white fish.	
Prevention:	Cook to safe degree of doneness. Reheat foods thoroughly. Store and hold hot foods at 135°F (57°C) or above. Store and hold cold foods at 40°F (4°C) or lower. Do not eat canned or packaged foods if containers are broken, bent, bulging or leaking. Do not eat food that has an off-color appearance or unusual odor.	

Clostridium Perfringens (Clostridium)

Symptoms:	Diarrhea and cramps. Occurs 4 to 22 hours after eating. Usually not fatal.	
Causes:	Eating contaminated meat, poultry and other high protein foods. Transmitted to food by handling or through the air.	
Prevention:	Cook foods thoroughly. Keep hot foods above 135°F (57°C) and cold foods below 40°F (4°C). Reheat leftovers to at least 165°F (74°C). Refrigerate cooked foods in small or shallow containers.	

Escherichia Coli Type 0157:H7 (E. coli)

Symptoms: Bloody and non-bloody diarrhea and abdominal cramps. Infection can lead to HUS (hemolytic uremic syndrome), a blood and kidney illness and TTP (thrombotic thrombocytopenic purpura), a blood and kidney illness that also affects the nervous system.



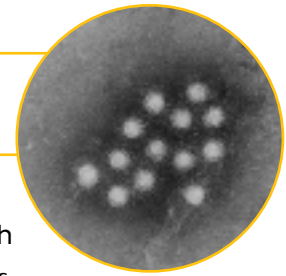
Causes: Eating under-cooked ground beef or drinking unpasteurized milk. Dairy cattle appear to be a major reservoir for this type of E. coli. The organism can spread easily from person to person, especially in day care centers and nursing homes.

Prevention: Beef, especially ground beef, tenderized steaks and injected beef products should be cooked thoroughly (160°F) and held thereafter at an appropriate hot or cold temperature. Undercooked beef should not be served to young children, the elderly and people with immune deficiency disorders. No one should drink unpasteurized milk. Many forms of E. coli have also been found on vegetables and fruits. Be sure to wash all fresh produce.

Hepatitis A

Symptoms: Inflammation of the liver, fever, jaundice, anorexia, nausea and malaise.

Causes: The fecal-oral route transmits Hepatitis A. A victim ingests something by mouth, which is contaminated with stool from an infected person. Infection can also result from food or beverages that are contaminated with the Hepatitis A virus.



Prevention: Avoid close contact with persons who are infected with Hepatitis A. Gamma globulin, if given within two weeks of exposure, can prevent infection. When handling food, always wash hands carefully after using the bathroom.



Lysteria Monocytogenes (Listeriosis)

Symptoms: Fever, fatigue, nausea, vomiting and diarrhea. More serious forms of listeriosis can result in meningitis (brain infections), septicemia (bacteria in the bloodstream), miscarriage, stillbirth, pneumonia, heart complications and skin lesions.

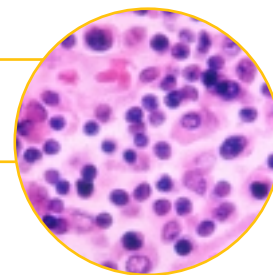


Causes: Eating foods of animal origin that are not thoroughly cooked, eating raw vegetables that are not washed, drinking raw milk, failure to wash hands, knives and cutting boards after handling uncooked foods, and cross-contamination of raw meats with vegetables and cooked foods.

Prevention: Thoroughly heat leftover or ready-to-eat foods, avoid raw/unpasteurized milk. Keep raw and cooked foods separate when preparing, cooking and storing. Always wash and clean vegetables before eating. Follow label instruction to “keep refrigerated” and follow “use by” dates. Keep hot foods above 135°F (57°C) and cold foods at or below 40°F (4°C). Keep your refrigerator clean and between 30-40°F (between -1 to 4°C). High-risk people (i.e. pregnant women and the elderly) should avoid soft and Mexican-style cheeses and reheat leftover or ready-to-eat foods until steaming hot.

Salmonella Typhosa (Typhoid Fever)

Symptoms: Abdominal pain, fever, constipation and headaches. 10% of reported cases are fatal.

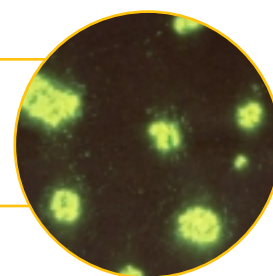


Causes: Eating food contaminated by infected individuals who have not thoroughly washed their hands after using the bathroom. Can be transmitted by people who show no symptoms.

Prevention: Food handlers should thoroughly wash hands after using the bathroom and practice good hygiene.

Salmonellae Bacteria (Salmonellosis)

Symptoms: Nausea, cramps, diarrhea, fever and occasional vomiting. Symptoms appear within 24 hours. Usually not fatal, but can be very serious.

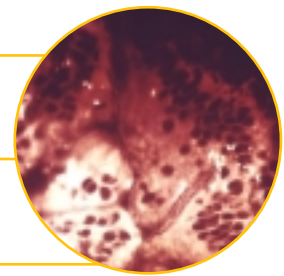


Causes: Eating raw or undercooked meat, fish, poultry, eggs, dairy products or foods prepared with them.

Prevention: Cook foods thoroughly. Keep foods below 40°F (4°C) or above 135°F (57° C). Reheat leftovers to at least 165°F (74°C).

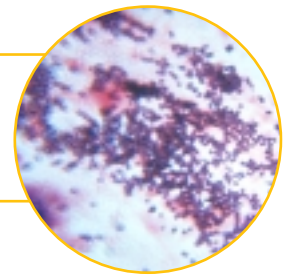
Shigella (Shigellosis)

Symptoms:	Gastrointestinal illness includes fever, abdominal pain and diarrhea with/without blood in the stools.
Causes:	Direct contact with infected person, or from food or water contaminated by an infected person.
Prevention:	Hand washing with soap and running water is the most important preventative measure to interrupt transmission of shigellosis, especially during an outbreak. Avoid having people with diarrhea handle food and limit the use of home-prepared foods at large gatherings.



Staphylococcus Bacteria (Staph)

Symptoms:	Nausea, vomiting, diarrhea, cramps, fever and chills. Symptoms appear within 2-4 hours and can persist to 24 to 48 hours. Rarely fatal, but can cause serious illness.
Causes:	Eating Staph contaminated meat, tuna, poultry, egg products, cream and sandwich fillings, potato, bean or macaroni salads. Staph organisms are found in human and animal respiratory passages and on skin. Employees who have open cuts or lesions on their hands transmit them to food. The bacteria are not transmitted by air. Food handlers should always wear gloves when handling foods, and never handle foods with exposed cuts.
Prevention:	Cook foods thoroughly. Keep hot foods above 135°F (57°C) and cold foods below 40°F (4°C). Reheat leftovers to at least 165°F (74°C).



Get One Step Closer to Getting Your Certificate of Completion

Now that you have completed this section and reviewed the corresponding portion of the video, you are ready to take the **“Section 2: Food Safety in the Deli”** test. Please refer to Section 6 of this manual for more information on how to test out. **Good Luck!**

