

FOOD SAFETY

It's Everyone's Business

County of Santa Clara
Department of Environmental Health
Consumer Protection Division

5th Edition
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County of Santa Clara
Environmental Resources Agency
Department of Environmental Health
Consumer Protection Division
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FOOD SAFETY *It's Everyone's Business*

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INTRODUCTION

It is crucial that food is properly handled and that food facilities are kept clean and sanitary to prevent customers from getting sick from the food you serve. Knowledge of proper food handling techniques is important in preventing foodborne illness.

According to the National Restaurant Association, ***"cost analysis of foodborne disease shows that the average outbreak costs an implicated restaurant \$73,858 in medical charges, lost wages, lost business, etc... this leads to further increases in liability insurance premiums."***

Bacteria, parasites, viruses, and toxins have all been implicated in foodborne illness. According to the recent estimates from the Centers for Disease Control, as many as 5,000 deaths and 325,000 hospitalizations can be attributed to foodborne illnesses in the United States each year.

Following safe food handling procedures will improve food quality, reduce food spoilage losses, and help maintain the high standard of service expected by customers. Failure to follow safe food handling practices can lead to foodborne illnesses and costly legal procedures.

Through this booklet, provided by the County of Santa Clara Department of Environmental Health, you will learn about foodborne illness and the standards that have been established to prevent illness from occurring in your food facility. Food facility inspections, conducted by Environmental Health Specialists with the Consumer Protection Division, are designed to monitor compliance with these standards and to help ensure a safe food product for your customers.

The law that governs the operation of all retail food facilities in California is known as the California Retail Food Code (CalCode) — Sections 113700 to 114437 of the California Health and Safety Code.

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FOODBORNE ILLNESS (FOOD POISONING)

❖ ***Illness caused by consuming contaminated foods or beverages.***

Foodborne illnesses are caused by consuming foods or beverages that have become contaminated by harmful substances or organisms. There are three basic categories of food related hazards that can result in a foodborne illness or injury:

1. **Biological Hazards** — harmful bacteria, parasites, viruses, fungi, insects, and poisonous plants and animals.
2. **Chemical Hazards** — harmful substances, such as cleaning solutions, pesticides, poisons, sanitizers, etc.
3. **Physical Hazards** — foreign objects such as glass, rocks, metal, wood splinters, etc.

BIOLOGICAL HAZARDS

Foodborne illnesses from biological hazards can generally be classified into three categories:

1. **Foodborne Infection** — results from eating food containing living, harmful microorganisms which then grow in the intestines to cause illness (e.g., *salmonellosis*).
2. **Foodborne Intoxication** — results from eating food containing bacterial or mold growth toxins that cause illness (e.g., *Staphylococcus*).
3. **Foodborne Toxin-Mediated Infection** — results from eating a large amount of disease-causing microorganisms that, once inside the human intestines, produce toxin to cause illness (e.g., *Clostridium perfringens*, *E. coli 0157:H7*).

CHEMICAL HAZARDS

Foods can also become contaminated by the improper storage and use of chemicals such as cleaning compounds. Always store chemicals away from food products, clean equipment, utensils, linens, and single-use articles, and be sure all chemicals are properly labeled to minimize the chance of chemicals contaminating foods.

PHYSICAL HAZARDS

In addition, foods can become contaminated by the presence of foreign objects. Maintain all food contact equipment in good repair; keep food preparation and storage areas clean; use proper storage methods for food, equipment, utensils, linens, and single-use articles; and use proper utensils for serving food to minimize the possibility of foreign objects entering food products.

PRIMARY CAUSES OF FOODBORNE ILLNESS

There are at least eight major food handling practices which can cause foodborne illness outbreaks:

1. Failure to properly COOK food.
 2. Failure to properly COOL food.
 3. Failure to properly REHEAT cooked foods to temperatures that kill bacteria.
 4. Allowing foods to remain within the temperature danger zone (41°F to 135°F).
 5. Preparing food several hours to several days in advance of serving.
 6. Raw, contaminated ingredients mixed into foods that receive no additional cooking (cross-contamination).
 7. Cross-contamination through improperly cleaned equipment or utensils.
 8. Contamination of food from employees who are ill or who practice poor personal hygiene.
-

BACTERIA (GERMS)

- ❖ ***Bacteria are everywhere.***
- ❖ ***Bacteria need food, warmth, and moisture to grow and multiply.***

Bacteria are found on all surfaces. If they are given sufficient food, warmth, and moisture, they will multiply and can cause illness and food spoilage. It is important to properly handle potentially hazardous foods so that bacteria do not multiply. Maintaining proper food temperatures will slow the growth of bacteria and will help to prevent foodborne illnesses.

Foods can also become contaminated by food workers who do not practice good personal hygiene. Proper handwashing and good personal hygiene help to minimize the presence of bacteria that can contaminate food.

SYMPTOMS OF FOODBORNE ILLNESS

❖ *Nausea, vomiting, and diarrhea are the most common symptoms.*

There are many symptoms related to foodborne illness with the most common being nausea, vomiting, and diarrhea. Afflicted persons may experience symptoms such as cramps, headaches, muscle aches, fever, and chills. Depending upon the type and amount of bacteria or bacterial toxin in the food, symptoms can begin within a few minutes to a few days after eating the contaminated food. The severity of symptoms can range from mild to severe, and the duration can extend from a few hours to days.

Although everyone who ingests contaminated foods may not become ill, some people are more susceptible than others. The very young and the elderly are the most susceptible to serious problems from foodborne illness since their immune systems may be inadequate at coping with illness. In addition, people with compromised immune systems such as HIV and AIDS patients, individuals taking antibiotics, pregnant women, cancer patients, and diabetics are more susceptible to the effects of foodborne illness.

One of the main reasons that Environmental Health Specialists investigate suspected foodborne illness outbreaks is to determine which practices may have been a cause of the illness and to verify correction of those practices.

FOOD SAFETY PROGRAM

Be aware that if your food facility is found guilty in a law suit involving a foodborne illness, both compensatory damages (the actual expenses incurred by the person or persons made ill) and punitive damages (a punishment for negligence on the part of the food facility) may be awarded. A functioning ***food safety program***, which incorporates the suggestions made in this manual, may limit your liability in two ways:

- *It significantly reduces the likelihood that food employees will prepare and serve food that can make your customers ill.*
- *It documents the fact that established food safety procedures were consistently followed.*

IF YOU OR YOUR CUSTOMERS GET FOODBORNE ILLNESS:

- ✓ **Stop serving the food.**
- ✓ **Advise the affected individuals to call their physician or seek medical attention.**
- ✓ **Call the Department of Environmental Health.**
- ✓ **Save the questionable food.**

If you (or an employee or a customer) get foodborne illness, it is important to act immediately so other people do not become sick. **AT ONCE** — stop serving the food items that were eaten. Separate and label suspect food to prevent its use. Do not throw out the foods; save any questionable foods in a bagged, tightly covered container or a clean, double plastic bag in the refrigerator for possible future laboratory analysis.

**All suspected foodborne illnesses should be reported to the
County of Santa Clara Department of Environmental Health.
(408) 918-3400**

Chapter 2 POTENTIALLY HAZARDOUS FOOD

POTENTIALLY HAZARDOUS FOOD

- ❖ ***High protein, moist foods such as meat, fish, poultry, and milk products.***
- ❖ ***Raw or heat-treated foods of animal origin.***
- ❖ ***Heat-treated foods of plant origin, raw seed sprouts, cut melons.***

POTENTIALLY HAZARDOUS FOODS CAN CAUSE ILLNESS IF NOT HANDLED PROPERLY

Any food or beverage, including water and ice, can be a vehicle for foodborne illness. Some foods, such as certain wild mushrooms, are poisonous by nature; however, most foodborne illness *can be attributed to potentially hazardous foods.*

Most foods derived from animal products, such as meat, fish, poultry, and dairy products are considered to be potentially hazardous. All of these foods contain the protein and moisture necessary for bacteria to grow and multiply. Some carbohydrates, such as refried beans, cooked rice, and baked potatoes are also potentially hazardous foods. When potentially hazardous foods are kept at improper temperatures, bacteria are given the opportunity to grow and multiply and cause foodborne illness.

The U.S. Food and Drug Administration defines a potentially hazardous food as *"...a food that is natural or synthetic and that requires temperature control because it is in a form capable of supporting...the rapid and progressive growth of infectious or toxigenic microorganisms..."* Potentially hazardous foods include food that consists in whole or in part of milk or milk products, shell eggs, meats, poultry, fish, shellfish, edible crustaceans (shrimp, lobster, crab, etc.), baked or boiled potatoes, tofu or other soy-protein foods, plant foods that have been heat-treated, foods of animal origin that are raw or heat-treated, raw seed sprouts, cut melons, some garlic in oil mixtures, and some synthetic ingredients.

To grow and multiply, most foodborne illness bacteria require foods that:

- have enough **moisture** — measured by water activity (a_w) —most of the foods we eat contain moisture.
- are higher in **pH** — pH is a measure of the acidity level — less acid means higher pH and better for bacterial growth.
- have an improper holding **temperature** — between 41°F and 135°F — the "temperature danger zone."
- have adequate **time** in the temperature danger zone.

There are foods which are NOT potentially hazardous. They are:

- foods with a water activity (a_w) value of 0.85 or less.
- foods with an acidity (pH) of 4.6 or below.
- foods which have been adequately commercially processed and remain in their unopened hermetically sealed container.
- foods that prevent the rapid and progressive growth of infectious and toxigenic microorganisms, or the growth of botulinum organisms, based upon laboratory evidence accepted by the Department of Environmental Health.
- a raw shell egg that has been pasteurized.

The following lists give approximate water activity and pH values of selected foods:

WATER ACTIVITY (a_w)

Potentially hazardous foods have a water activity value of greater than 0.85.

ANIMAL PRODUCTS	a_w range	PLANT PRODUCTS	a_w range
fresh meat, poultry, fish	0.99 - 0.99+	fresh fruits, vegetables	0.97 - 0.99+
most types of cheese	0.95 - 0.99+	jams, jellies	0.75 - 0.94
cured meat	0.87 - 0.95	dried fruit	0.55 - 0.80
Parmesan cheese	0.68 - 0.76	cereal	0.10 - 0.20
dried whole milk	0.20	sugar	0.19

FOOD ACIDITY (as measured by pH)

Potentially hazardous foods have a pH level greater than 4.6.

FRUITS	pH range	VEGETABLES	pH range
apples	2.9 - 3.3	asparagus	5.0 - 6.1
bananas	4.5 - 5.2	beans (lima and string)	4.6 - 6.5
grapefruit	2.9 - 4.0	beets	4.9 - 5.8
grapes	3.3 - 4.5	broccoli	6.5
limes	1.8 - 2.0	Brussels sprouts	6.3 - 6.6
melons (honeydew)	6.3 - 6.7	cabbage	5.2 - 6.3
olives	3.6 - 8.0	carrots	4.9 - 6.3
oranges	2.8 - 4.0	celery	5.7 - 6.0
peaches	3.1 - 4.2	corn (sweet)	5.9 - 7.3
pears	3.4 - 4.7	lettuce	6.0 - 6.4
pineapple	3.2 - 4.1	onions	5.3 - 5.8
plums	2.8 - 4.6	potatoes	5.3 - 6.3
tomatoes	3.7 - 4.9	spinach	5.1 - 6.8
watermelons	5.2 - 5.6	squash	5.0 - 5.4

NON-HAZARDOUS PRODUCTS

The following methods of processing, when properly conducted, can make certain food products non-hazardous:

- **drying** — including beef jerky, summer sausage, powdered milk, and hard grating cheese
- **salting** — including "Smithfield-type" ham and certain bacons which have been slowly salt cured
- **acidifying** — including pickled pigs feet and pickled herring
- **aging** — including uncut wheels of cheddar cheese
- **commercial canning** under controlled conditions of time, temperature, and pressure — including corned beef, tuna, condensed milk, hot-packaged pasteurized process cheese, and aseptically processed dairy products.

POTENTIALLY HAZARDOUS PLANT PRODUCTS

The natural protective barriers of plants such as vegetables, legumes, and grains can be destroyed by heating, scalding, blanching, or cooking. These processes can both kill beneficial organisms that would normally crowd-out pathogens, and breakdown the plant's protein and complex carbohydrates into forms that are more usable by disease-causing microorganisms. Many foods in the plant category have led to foodborne illness outbreaks after heating, including:

bean curd (tofu) — *Yersinia enterocolitica*
 corn — *Staphylococcus aureus*
 lima beans — *S. aureus*
 mushrooms — *Salmonella sp.*
 refried beans — *S. aureus, Salmonella sp.*
 rice — *Bacillus cereus, S. aureus*
 squash — *Clostridium perfringens*
 sweet potatoes — *Salmonella sp.*

Cooked plant products are potentially hazardous when conditions for growth of *Clostridium botulinum* (the organism that can cause botulism) are favorable due to a lack of oxygen in the food mass combined with a pH above 4.6. Inadequately heat-treated (cooked, canned) fruits and vegetables that have been occasionally implicated in outbreaks of botulism include:

apple butter	cabbage	figs	onions	pimentos	tomatoes
apple sauce	carrots	green beans	peaches	potatoes	turnips
apricots	cauliflower	lima beans	pears	pumpkin	zucchini
asparagus	celery	mangoes	peas	shallots	
beets	corn	mushrooms	peppers	spinach	
blackberries	cucumbers	okra	persimmon	squash	
black-eyed peas	eggplant	olives	pickles	Swiss chard	

Chapter 3

TEMPERATURE CONTROL

THERMOMETERS

- ❖ ***An approved and suitable thermometer must be used to check temperatures of both hot and cold foods.***
- ❖ ***A thermometer must be provided in each refrigeration unit.***

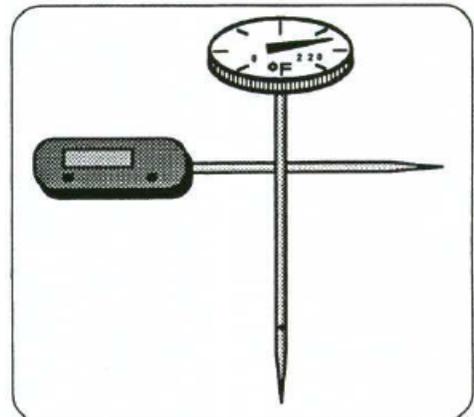
Temperature control is an extremely important factor in limiting the growth of bacteria that cause foodborne illness. Thermometers are necessary to ensure that both refrigeration and hot-holding equipment are functioning properly. Thermometers are also necessary to monitor cooking, reheating, and cooling procedures.

The use of a metal stem (probe) thermometer with a range of at least 0°F to 220°F is critical during food preparation. The ***actual temperature of the food*** must be checked — relying on thermostat settings or air temperature readings can be misleading. Check food temperatures in the center of the food container or in the thickest part of a food mass for the most accurate readings. Take a reading in more than one place, and take readings often!

When using a metal stem thermometer, REMEMBER to sanitize the thermometer stem BEFORE each use, and to clean the stem AFTER each use to remove food residues. Don't contaminate a food product with a dirty thermometer!

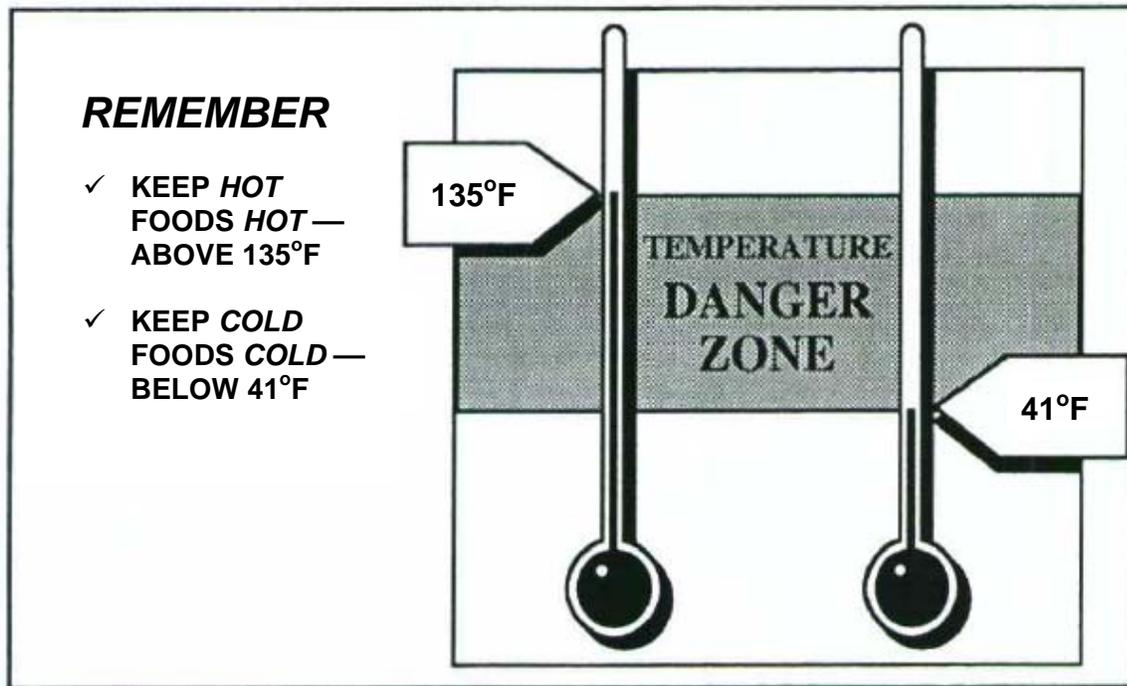
Thermometers can be sanitized in one of the following ways:

- ✓ by wiping for 7 seconds with a 70% isopropyl alcohol prep swab,
- ✓ by washing and rinsing, followed by dipping in bleach, followed by holding under "running" water, or,
- ✓ by using an alternate method approved by the Department of Environmental Health.



TEMPERATURE DANGER ZONE (BETWEEN 41°F and 135°F)

Potentially hazardous foods kept between 41°F and 135°F will allow the growth of bacteria that cause foodborne illness — that's why this temperature range is called the *temperature danger zone*.



Refrigeration temperatures are very important! All refrigeration units must have a *visible, accurate* thermometer placed in the warmest section of the unit. However, it is important to remember that the air temperature of a refrigerator may be lower or higher than actual temperatures of foods held in the refrigerator. Check refrigerator thermometers frequently, and check the temperatures of the foods to be certain that each refrigeration unit is keeping *food product temperatures* at or below 41°F.

Immediately repair or adjust any refrigeration, cooling, or hot-holding equipment that is *not* keeping food at the appropriate temperature! Be sure to transfer potentially hazardous foods to holding units that *are* able to maintain required temperatures. Reheating cooled foods, or placing hot food containers in an ice-bath, may be necessary to rapidly bring foods out of the temperature danger zone prior to transferring foods to hot or cold holding units.

Cooked potentially hazardous foods should be cooled from 135°F to 70°F within 2 hours; and then cooled from 70°F to 41°F within 4 hours. If food has been in the danger zone for longer than these time requirements, it may be dangerous and should be discarded!

COOKING TEMPERATURES

The risk of bacteria surviving the cooking process is best controlled by cooking to a minimum **internal** temperature that will **kill** disease-causing organisms.

Minimum internal cooking temperatures for specific food types are listed below. These temperatures should be reached as rapidly as possible, preferably within 2 hours cooking time:

PRODUCT	TEMPERATURE °F
• all poultry (including ground poultry)	165° for 15 sec
• stuffed meats, fish, poultry, or ratites	165° for 15 sec
• stuffing containing meat, fish, poultry or ratites	165° for 15 sec
• pasta stuffed with raw or undercooked animal foods	165° for 15 sec
• all reheated foods	165° for 15 sec
• ground meat (beef, veal, lamb, pork, etc)	155° for 15 sec
• ratites (ostrich, rhea, emu), injected meats	155° for 15 sec
• single pieces of meat (beef, veal, lamb, pork, etc)	145° for 15 sec
• fish	145° for 15 sec
• raw shell eggs (immediate service)	145° for 15 sec
• raw shell eggs, foods containing raw eggs (other than immediate service)	155° for 15 sec
• other potentially hazardous foods	135° for 15 sec
• rare roast beef (whole, not rolled)	130° (and maintained at that temp for 2 hours before serving)

Thorough cooking of potentially hazardous foods is important! Use a metal stem thermometer to check for proper cooking temperatures.

All poultry, poultry products, stuffed meats and stuffing containing fish, meat, poultry or ratites must reach at least 165°F for 15 seconds to destroy *Salmonella*. Pork and pork products must reach at least 145°F for 15 seconds to prevent trichinosis. All other meats, meat products, seafoods, and seafood products must be cooked to 145°F for 15 seconds (or hotter) in order to kill any harmful bacteria. An exception to this is rare beef, which may be cooked to 130°F and then maintained at that temperature for 2 hours prior to serving.

It is dangerous to cook large **frozen** roasts or **frozen** turkeys because their large size can prevent the inner portions from reaching the minimum required cooking temperature that will kill harmful bacteria. These types of foods should be safely thawed prior to cooking. It is also important that **all inner portions of stuffed poultry, meats, fish or ratites** reach the minimum required cooking temperature of 165°F for 15 seconds.

MICROWAVE COOKING

Microwave ovens tend to cook foods unevenly — stir or rotate food during the cooking process to be sure all portions reach the minimum required temperature and completely enclose the food in a container to retain surface moisture during cooking. All raw or incompletely cooked foods must be heated to a temperature of 165°F for 15 seconds in all parts of the food. Allow foods to stand covered for 2 minutes after cooking to obtain temperature equilibrium.

COOLING FOODS

- ❖ *Reduce food depth to 4 inches or less.*
- ❖ *Divide large quantities of food into smaller portions.*
- ❖ *Rapidly chill food in a refrigerator or use an ice bath along with agitation of the food.*
- ❖ *Use a metal stem thermometer to check food temperatures while cooling.*
- ❖ *Cool food to 41°F as quickly as possible.*

It is important to RAPIDLY cool foods to reduce the potential for bacterial growth and toxin production.

Whenever possible, avoid the necessity to cool by making foods fresh just before serving!



Research indicates that the improper (slow) cooling of potentially hazardous foods is a significant factor contributing to foodborne illness outbreaks.

COOLING SOLID OR SEMI-SOLID FOODS

- ❖ **Reduce food depth to 4 inches or less.**
- ❖ **Refrigerate uncovered while the food is still hot.**

Solid or semi-solid foods such as meats, refried beans, rice, potatoes, casseroles, stews, and thick chowders **must be cooled as rapidly as possible** to stop harmful bacteria from growing. Large roasts and turkeys should be cut into pieces 4 inches or less in thickness.

To properly cool solid or semi-solid foods:

- ✓ **Divide large quantities** of hot food into smaller or thinner portions.
- ✓ **Use shallow metal pans** — after cooking or hot-holding, immediately reduce the depth of the food to 4 inches or less.
- ✓ **Label** each food container with the date, time, and contents.
- ✓ **Promptly refrigerate** food while still hot. Place uncovered food containers on top shelf of refrigerator directly across from the fan (the coldest location) — *do not stack pans during the cooling process.*
- ✓ **Do not cover hot food** — covers will trap hot air and foods will cool slower.
- ✓ **Cool foods through the temperature danger zone** as quickly as possible:
 - *Cool from 135°F to 70°F within 2 hours, then...*
 - *Cool from 70°F to 41°F within 4 hours.*
 - *Cool foods from ambient temperatures to 41°F within 4 hours.*
- ✓ **Cover food containers** after the center of the food mass reaches 41°F or less. Containers may be relocated within the refrigerator after they have cooled and been covered.

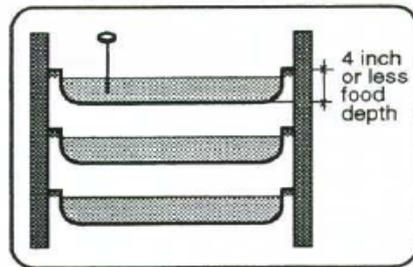
COOLING LIQUID FOODS

- ❖ **Reduce food depth to 4 inches or less.**
- ❖ **Rapidly cool by using shallow pan or ice bath method.**
- ❖ **Refrigerate uncovered until cooled to 41°F or lower.**

Liquid foods such as thin soups and sauces **must be cooled as rapidly as possible** to stop harmful bacteria from growing. Cool liquid foods using the **shallow pan** method or the **ice bath** method.

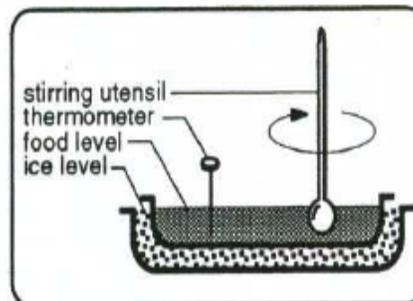
To properly cool foods using the shallow pan method:

- ✓ Reduce the depth of the food to a maximum of 4 inches after cooking or hot-holding and **immediately** refrigerate the uncovered food while still hot.
- ✓ Label food containers with the date, time, and contents.
- ✓ Leave foods **uncovered** in the coldest portion of the refrigerator until all portions have cooled to 41°F.
- ✓ Check the food temperatures with a metal stem thermometer.
- ✓ **Use metal pans** which cool foods fastest.
- ✓ Do not stack pans during the cooling process.
- ✓ Cover foods after a temperature of 41°F is reached — be certain foods have cooled **from 135°F to 70°F within 2 hours and from 70°F to 41°F within 4 hours.**



To properly cool foods using the ice bath method:

- ✓ Place a metal container of the hot food in a large sink with the drain closed.
- ✓ Fill the sink with ice to the level of the food inside the container.
- ✓ Add cold water to the ice.
- ✓ **Stir the food frequently** to promote even cooling.
- ✓ Add more ice as it melts.
- ✓ Check the food temperatures with a metal stem thermometer.
- ✓ Be certain foods have cooled **from 135°F to 70°F within 2 hours and from 70°F to 41°F within 4 hours.**
- ✓ Cover the food, label with date, time, and contents, and refrigerate.



If foods do not cool rapidly, you may be trying to cool too much food with an inadequate amount of ice — break the food down into smaller containers and cool each container in separate ice baths **or** reduce the food depth to 4 inches or less and refrigerate.

Other methods to help RAPIDLY cool foods include:

- ✓ Separate or cut food into smaller or thinner portions.
- ✓ Use less water during cooking — add ice after cooking.
- ✓ Purchase a blast chiller or use a cook-chill system.
- ✓ Add more walk-in refrigeration space.
- ✓ Use cooling wands (ice paddles).

FACTORS THAT AFFECT THE RATE OF COOLING:

- **Nature of Food.** Heat moves more slowly through dry, firm, or solid material than it does through more fluid or liquid material.
- **Container Geometry.** The thickness or distance to the center of the food mass has the greatest influence on the cooling rate. Food cools fastest in shallow pans of 4 inches or less in depth. *DOUBLING the food depth will QUADRUPLE the cooling time!*
- **Heat Transfer.** Some food containers transfer heat more rapidly than others. Stainless steel transfers heat over 100 times more quickly than plastic containers.

THERMAL CONDUCTIVITY VALUES	BTU/Ft./Hr.°F
aluminium	113
stainless steel	39
glass	0.3 - 0.6
plastic	0.27 - 0.30
air	0.017

- **Agitation.** Stirring foods during the cooling process will accelerate cooling.
- **The Type and Capacity of Refrigerator.** Most refrigerators are cold-holding units designed to *receive* foods already at 41°F or below and keep them cold. Quick-chill units (blast chillers) can cool hot foods down to a temperature of 37°F within 90 minutes.
- **Location within Cooling Unit.** Place shallow metal pans without covers on top shelves directly across from the fan (the coldest location). After food temperatures are below 41°F, cover pans and relocate.



***Although time consuming,
cooling MUST be done properly!***

- ✓ ***Remember, inadequate cooling is a leading cause of foodborne illness!***
- ✓ ***Check food temperatures often with a metal stem thermometer!***
- ✓ ***Whenever possible, avoid the necessity to cool by making foods fresh just before serving!***

COLD-HOLDING

- ❖ **Keep cold food at 41°F or colder.**
- ❖ **Hold frozen food at 0°F or colder.**
- ❖ **Check food temperatures with a metal stem thermometer.**

Bacteria that cause foodborne illness can rapidly grow in potentially hazardous foods that are not kept at or below 41°F. Each refrigeration unit must have an accurate thermometer in a visible location to measure the air temperature. In addition, **a metal stem thermometer must also be available** to check the actual temperature of the food itself in refrigerators, salad bars, preparation units, and other areas where food is kept cold.

Adequate air circulation is needed for refrigeration units to work properly and to maintain cold temperatures. Store foods so air can circulate — do not overcrowd or line shelves; do not place sheet pans or boxes so close together that they obstruct air circulation.



REMEMBER

- ✓ **A 41°F air temperature DOES NOT necessarily mean the FOOD itself is at 41°F or below.**
- ✓ **Do not rely on air temperatures alone to ensure food safety.**
- ✓ **Always check food product temperatures!**
- ✓ **Don't overcrowd — allow air to circulate.**

Many foods, like fish, shellfish, milk, poultry, and red meat, keep longer if stored at temperatures below 40°F — follow instructions provided by the distributor.

Ice may be used to keep cold foods below 41°F at salad bars, preparation tables, or for foods on display. However, when using ice **instead** of mechanical refrigeration, you **must pre-chill all potentially hazardous foods** to 41°F or below **before** placing in ice, and the container of food must be packed in ice up to the level of the food. REMEMBER: stainless steel containers cool foods over 100 times more quickly than plastic containers, and stainless steel helps keep food cold.

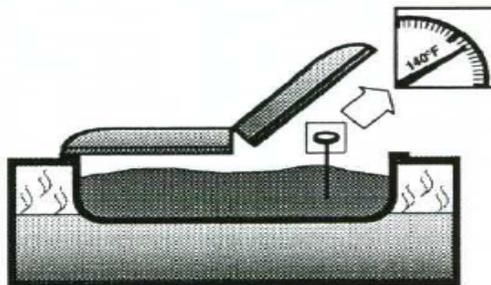
HOT-HOLDING

- ❖ **Keep hot food at 135°F or hotter.**
- ❖ **Check food temperatures with a metal stem thermometer.**

Bacterial growth can occur at temperatures that are warm but not hot. Most pathogenic or disease-causing organisms grow best at temperatures that are close to body temperature (98.6°F). Always have a metal stem thermometer available for checking food temperatures.

To properly use hot-holding equipment:

- ✓ **Preheat equipment** — steam tables, soup warmers, and other hot-holding equipment should be preheated (to a minimum of 135°F or higher) at least 1 hour before use.
- ✓ **Preheat food** — always use heating equipment to preheat foods **to at least 135°F (or its higher required cooking temperature - see page 3-3)** before placing into holding equipment. Preheating will help keep the food temperature from falling below 135°F when food is transferred to the holding equipment.
- ✓ **Reheat** previously cooked or partially used foods **to at least 165°F for 15 seconds** before placing into hot-holding equipment.
- ✓ **Maintain food temperatures at 135°F** or higher at all times in hot-holding equipment — be sure the temperature control is set high enough.
- ✓ **Use a metal stem thermometer** to check the actual food temperature — do not rely on a thermostat setting or the presence of steam to verify food temperatures.
- ✓ **Do not heat cold foods in hot-holding equipment** — this type of equipment is **not** designed to heat food rapidly to required temperatures. Hot holding equipment is designed to hold food that has already been heated.
- ✓ **Stir foods frequently** to maintain even heating and to avoid cold spots.
- ✓ **If using a water-bath** steam table, be sure that an adequate depth of water is provided.
- ✓ **Keep food containers covered** to help maintain product temperature.



REHEATING

- ❖ ***Rapidly reheat food to 165°F or hotter.***
- ❖ ***Use a metal stem thermometer to check food temperatures.***

When reheating for hot holding, it is critical to ***rapidly reheat*** potentially hazardous foods to 165°F or higher in order to kill or destroy most disease causing bacteria and viruses. Equipment which will rapidly reheat foods includes stoves, burners, convection ovens, double boilers, and microwave ovens. ***Do not*** use hot-holding equipment to reheat foods — this equipment is not designed for reheating and cannot heat foods rapidly enough to prevent bacterial growth. ***Do not*** use steam tables, bain maries, crock pots, and steamers for reheating.

All parts of the food product must be thoroughly reheated — **food must be stirred or turned**, especially if a microwave is used, to ensure that all areas of the food reach 165°F for 15 seconds. When reheated in a microwave oven, foods must be covered to retain surface moisture and left to stand for at least 2 minutes after cooking to reach temperature equilibrium. Always use a metal stem thermometer to check for adequate reheating temperatures.

All meats must be reheated to 165°F for 15 seconds. Therefore, no reheated meats can be "rare;" all reheated meats must be served "well done."



FOLLOW THESE GUIDELINES FOR SAFE REHEATING:

- ✓ Rapidly reheat previously cooked foods to 165°F or above as rapidly as possible, and definitely within 2 hours.
- ✓ Never mix leftover foods with fresh foods.
- ✓ Never reheat previously prepared food more than once.

AVOID ADVANCE PREPARATION OF POTENTIALLY HAZARDOUS FOODS WHENEVER POSSIBLE

❖ Prepare potentially hazardous foods just before service.

Advance preparation of potentially hazardous foods should be avoided whenever possible. When foods are prepared too far ahead of the service time, bacteria may have enough time to grow to dangerous levels if proper food temperatures are not maintained — this excessive bacterial growth could cause a foodborne illness. Whenever possible, potentially hazardous foods should be prepared just before service to reduce health risks.

Common mistakes such as improper cooling, inadequate refrigeration, and improper reheating can easily occur and result in a foodborne illness outbreak. Foods that are cooled, refrigerated, and reheated before service have a greater potential for causing foodborne illness. Food handling problems can be reduced if potentially hazardous foods are prepared from fresh, refrigerated ingredients, cooked as required, and served immediately.

PREPARATION OF COLD SALADS AND SANDWICH SPREADS

❖ Use utensils to mix food — do not use hands.

❖ Use ingredients that have been pre-chilled to 41°F or less.

Foods such as potato salad, macaroni salad, egg salad, and chicken salad may allow the growth of bacteria that cause foodborne illness. Dicing, slicing, and mixing may contaminate the food with bacteria from employee hands or work surfaces. To keep bacteria from growing, all the ingredients that are cooked in advance must be properly cooled to 41°F or below before mixing together. For example, potato salad should be made with cold hard-boiled eggs and cold cooked potatoes; and tuna salad should be made with chilled cans of tuna and chilled mayonnaise.

THAWING METHODS

- ❖ *In refrigeration units.*
- ❖ *Under cold running water.*
- ❖ *In a microwave followed by immediate cooking.*
- ❖ *By cooking frozen product to 135°F or above.*

ACCEPTABLE METHODS FOR THAWING POTENTIALLY HAZARDOUS FOODS ARE:

1. ***In a refrigerator*** at temperatures of 41°F or less.
2. ***Under cold, potable running water*** at a temperature of 70°F or less for no more than 2 hours. (Note: this method is not recommended for larger food items). Thawing food under running water requires:
 - a) a clean, sanitized food preparation sink (*NOT a utensil sink*) that is indirectly connected to the sewer.
 - b) preventing cross-contamination from dirty utensils, equipment, linens, or food contact surfaces.
 - c) a water flow velocity that will remove loose food particles with the overflow.
3. ***In a microwave oven, but ONLY if*** the food will be cooked immediately following thawing.
4. ***Cooking*** the frozen product to 135°F or above (see required minimum internal temperatures on page 3-3).
5. ***It is NEVER acceptable*** to thaw potentially hazardous foods on the counter, at room temperatures, or in warm water — these methods can allow dangerous bacteria to grow and multiply to levels which could cause foodborne illness.

ROOM TEMPERATURE STORAGE OF FOODS

- ❖ *Do not store potentially hazardous foods at room temperature.*
- ❖ *Always keep potentially hazardous foods above 135°F or below 41°F.*
- ❖ *Avoid lengthy preparation times or large batch preparation.*

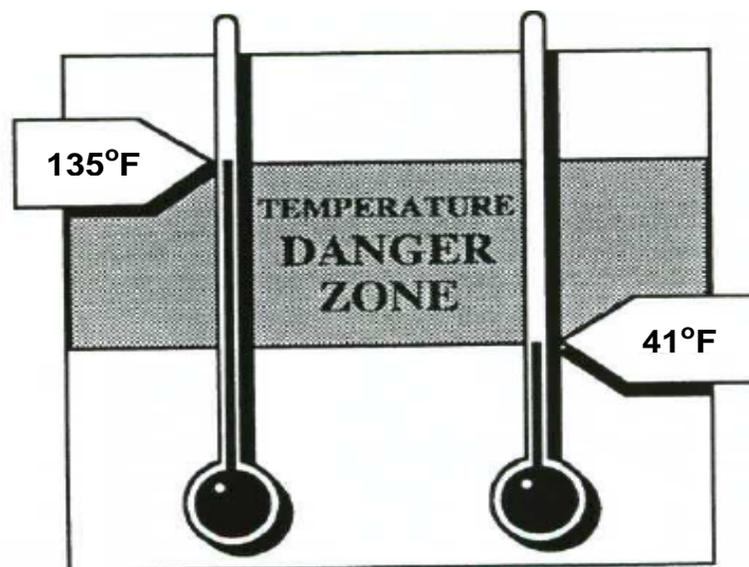
Bacteria that cause foodborne illness grow rapidly in potentially hazardous foods that are kept at room temperatures.

All hot foods, including meats, poultry, soups, stews, beans and sauces, must be kept at or above 135°F, transferred to shallow pans and immediately refrigerated, or placed in an ice bath for proper cooling.

All cold foods, including sandwich and omelet ingredients, cream filled pastries, and liquid coffee creamers (except non-dairy and ultra-pasteurized), must be kept in a refrigeration unit at 41°F or colder, or properly iced.

When preparing large quantities of foods, remove only a small portion at one time from refrigeration or hot-holding equipment and keep the remainder of the food hot or cold. After preparation is complete, immediately return foods to a refrigerator or hot-holding unit. **Minimize the length of time food is allowed in the danger zone!**

Potentially hazardous foods must never be stored at room temperature!



EQUIPMENT FAILURE

- ❖ ***Make sure potentially hazardous foods are kept hot (over 135°F) or cold (below 41°F).***
- ❖ ***Close your food service facility if you have an extended power outage, loss of water supply, or sewage backup.***
- ❖ ***Call the Department of Environmental Health for help and advice.***

If your food facility loses power, or hot or cold water supply, or sewage backs up into the building, the operation ***must*** be closed so that it does not create a public health hazard.

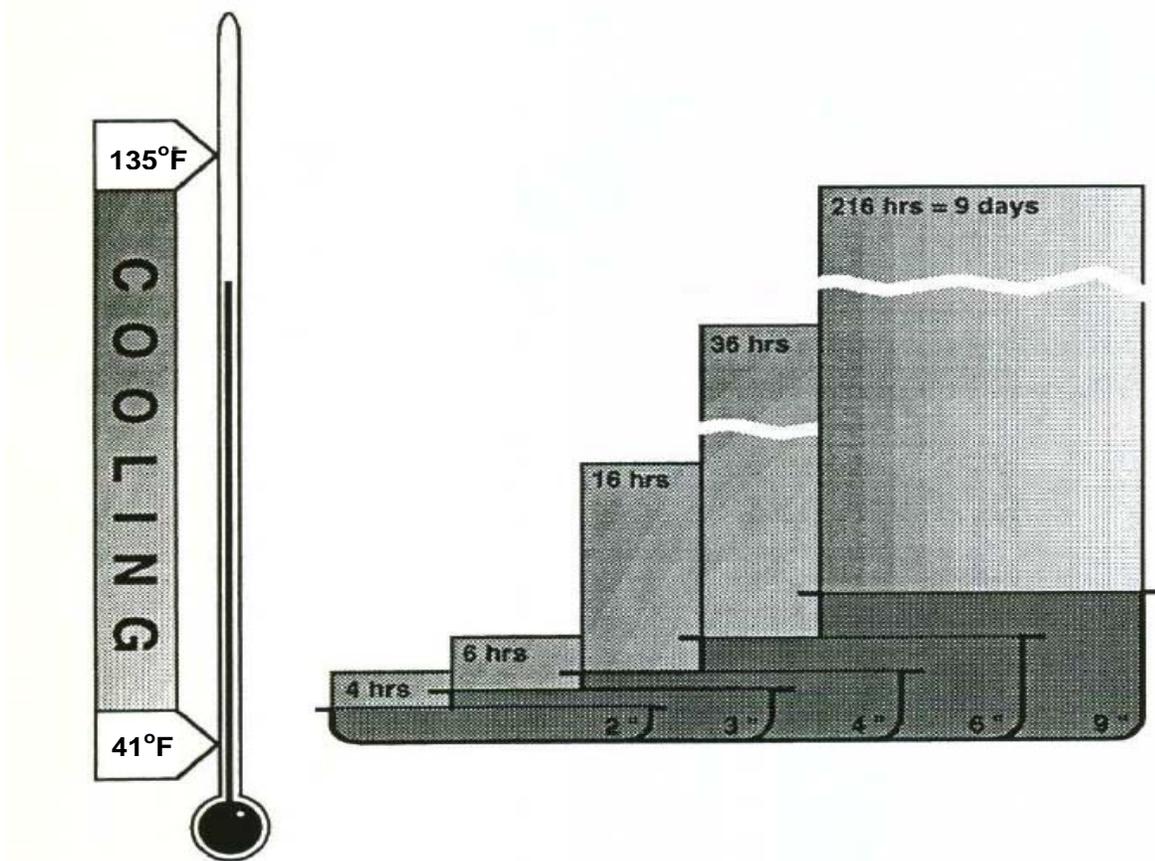
If a refrigerator breaks down but the food temperatures are still below 41°F, move the food to another unit that is working properly. If hot-holding equipment fails and the food is still above 135°F, move the food to a unit capable of maintaining proper temperatures, or rapidly cool those foods to below 41°F using approved cooling methods (*see pages 3-4 through 3-7*), and then refrigerate. ***Always use your metal stem thermometer to check the temperatures.***

If a refrigerator or hot-holding unit breaks down and the food has been in the danger zone for longer than 2 hours, all potentially hazardous foods should be discarded.

**For assistance in making these determinations,
call the County of Santa Clara
Department of Environmental Health
(408) 918 -3400**

COOLING TIME — Comparison Based on Food Depth

Length of time required in a refrigerator to cool food from 135°F to 41°F:



REMEMBER

- ✓ Use shallow, metal pans whenever possible.
- ✓ Do not cover food during cooling.
- ✓ Cool foods to 41°F as quickly as possible.

Chapter 4

PREVENTING CONTAMINATION OF FOODS

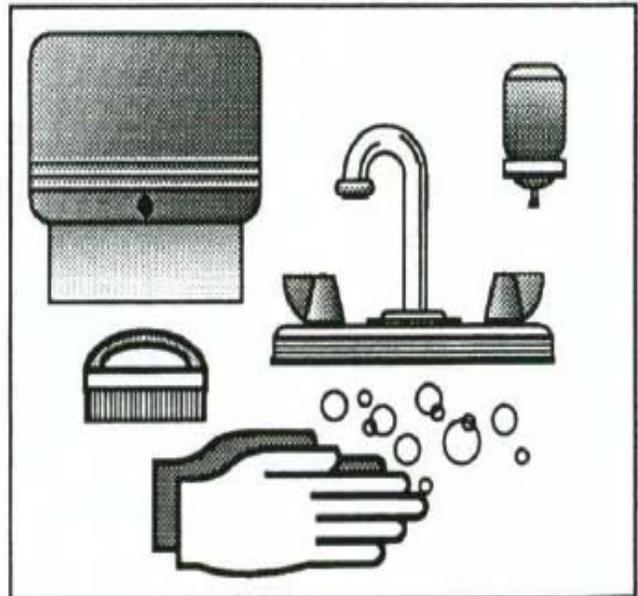
HANDWASHING

- ❖ *Handwashing helps prevent foodborne illness.*
- ❖ *Always wash your hands before starting work and after:*
 - Meals or breaks.*
 - Using the toilet.*
 - Handling raw meats and produce.*
 - Handling unclean objects.*
 - Smoking.*
- ❖ *Wash with warm, soapy water and dry with paper towels or heated-air hand dryer.*
- ❖ *Wash your hands frequently during food preparation.*

Improper or lack of handwashing is a major cause of many foodborne illnesses. Bacteria grows well on skin, and hands are easily contaminated with bacteria. It is important to wash your hands regularly to reduce the possibility of bacteria and viruses being passed from your hands to food. It is especially important to wash your hands after using the toilet because bacteria from fecal material can contaminate a person's hands and the bacteria can then be transferred to food.

Provide liquid handwash soap in proper dispensers, and single service paper towels in proper dispensers at all restroom and kitchen handwash sink locations.

Many people think of money as "dirty." Although the fungistatic ink on bills and the toxic metals in coins may make disease transmission unlikely, recent studies have revealed that bacteria can survive on both coin and paper money. To be safe and to avoid negative customer reactions, minimize or eliminate the handling of food and money by the same person whenever possible.



ALWAYS WASH YOUR HANDS AFTER:

- using the toilet.
- smoking or chewing tobacco.
- coughing or sneezing.
- using a handkerchief or tissue.
- touching or scratching areas of the body.
- handling raw foods, especially meat, poultry, fish, and shellfish.
- touching, clearing away (bussing), or scraping dirty dishes and utensils.
- performing janitorial cleanup operations and after handling chemicals or cleaners.
- disposing of garbage and trash.
- touching delivery containers, soiled clothing, wash rags, and unclean equipment or work surfaces.
- receiving and putting away incoming orders.
- eating food or drinking beverages.
- touching any live animal.
- doing anything else that contaminates the hands.

HANDWASHING TIPS

- ✓ **HOW TO WASH.** Use soap and warm water (100°F) to work up a lather. Wash the hands, wrists, and forearms, i.e., all areas that might come into contact with food. Use a fingernail brush after handling raw meats, fish, or poultry, or using the toilet. Pay particular attention to areas between the fingers and around and under the nails.
- ✓ **HOW LONG TO WASH.** 20 seconds of vigorous washing is a good rule (this is shorter than the 2-5 minutes a surgeon spends scrubbing). Have staff members time themselves. *Hint: singing the children's ABC's song or a complete verse of "Old McDonald Had a Farm" to themselves is a good way to gauge the 20 seconds.*
- ✓ **HOW TO DRY.** Use single-use paper towels or hot air blower. Moisture encourages the growth of bacteria; therefore hands must be dried thoroughly. Cloth hand towels or aprons are not allowed for hand drying because, if wet or dirty, they can re-contaminate clean hands.
- ✓ **HOW OFTEN TO WASH.** Hands must be washed as often as necessary to prevent contamination of food.

HAND CONTACT — USE OF UTENSILS

- ❖ ***Avoid hand contact with foods.***
- ❖ ***Use utensils whenever possible.***

Hands are easily contaminated with many types of bacteria that can make people sick if the bacteria get into foods. Some hand contact during food preparation may be necessary, but, ***whenever possible, use the proper utensil instead of your hands.***

PLASTIC GLOVES

Plastic gloves can provide an additional barrier between the food and food handler if used properly. ***However, remember that contaminated gloves, like contaminated utensils, will contaminate food!*** Any action that requires handwashing means that food handlers must discard the gloves they are wearing, wash and dry their hands, and put on clean gloves before returning to food handling activities.

Use disposable plastic gloves or other utensils such as scoops, forks, tongs, paper wrappers, or other implements if the food you are preparing requires extensive hand contact. Use appropriate utensils to transfer food from one container or from one place to another.

Unprotected wounds, open sores, cuts, or abrasions can be sources of disease-causing bacteria. These areas must be aseptically bandaged and covered with waterproof, disposable plastic gloves that will protect both the food and the food handler.

CULINARY HABITS

- ❖ ***Don't use the same spoon more than once to taste food.***
- ❖ ***Don't use your fingers to taste food.***
- ❖ ***Don't eat or drink while handling food.***

Use a tasting spoon only once and do not reuse it until it has been washed and sanitized — once a spoon is used it is contaminated and can contaminate the food if used again without washing. Using your fingers for tasting can also contaminate food — ***always use a tasting spoon, and use it only once.***

SMOKING

- ❖ ***Don't smoke when preparing or serving food.***
- ❖ ***Wash hands after smoking.***

Smoking during food preparation or food service can contaminate food. Smoking contaminates your hands (from both the cigarette and your mouth), which in turn can contaminate food or food contact surfaces.

Smoking should be done during breaks in designated areas only. ***Smoking is not allowed in any food preparation, dishwashing, or food storage area.*** Always wash your hands after smoking and before returning to work.

EMPLOYEE PERSONAL HYGIENE

Food employees must be clean — they should shower or bathe each day prior to leaving home for work.

- **Fingernails** — Fingernails should be trimmed and neat. Ragged, long, false, and acrylic nails are all more likely to harbor bacteria or break off into food. Avoid nail polish — it can easily chip off into the food. Food handlers with false, long, or polished nails ***must*** wear gloves when handling food.
- **Jewelry** — Avoid wearing jewelry such as rings, bracelets, and watches while conducting food handling activities. Jewelry collects dirt and is difficult to clean, and it can get caught in machinery, or catch on sharp or hot objects causing injury to the worker.
- **Orthopedic Support Devices** — Gloves must be worn whenever these devices are worn or used by food employees.
- **Hair** — Keep hair clean. All food preparation employees must wear hair restraints such as hairnets or caps to prevent the contamination of food or utensils. Wash your hands after touching hair.
- **Clothing and Personal Garments** — Ideally, clean work garments should be put on *at* the food service facility. If you ***must*** dress at home, be sure to wear a fresh, clean change of clothes to work. Dirty clothing is unacceptable since it can carry disease-causing organisms which can contaminate food. Do not wipe your hands on your clothing.

Store clothing and personal items in the change room, in lockers, or a designated area where contamination of food, equipment, utensils, linens, and single-use articles cannot occur.

DON'T WORK AS A FOOD HANDLER IF YOU HAVE AN ILLNESS THAT CAN BE SPREAD THROUGH FOOD

- ❖ ***Don't work if you have a cold, the flu, a runny nose, a sore throat, diarrhea, or vomiting.***
- ❖ ***Don't work in food preparation or utensil washing if you have an infected cut, burn, or wound on your hand.***

Food employees should not work if they have an illness or disease that can be spread through food handling activities. Many of the bacteria or viruses that cause these illnesses are easily transferred from the ill food employee to food and then to customers who eat the food prepared by the ill worker.

Infected cuts, burns, and wounds are common problems for food service workers. Anyone with an infected cut, burn, or wound should not prepare food or wash dishes.

- **Food employees** must report to management if diagnosed with any of the following illnesses: *Salmonella typhi*; *Salmonella spp*; *Shigella spp*; *Entamoeba histolytica*; *Enterohemorrhagic* or *shiga toxin producing Escherichia coli*; *Hepatitis A virus*; and *Norovirus*.
- **Food employees** must also report any open or draining lesion or wound unless it is properly covered and protected.
- **Managers** are required to provide instruction to food employees concerning personal hygiene as it relates to food safety. They must be sure their food employees understand the association between hand contact, personal habits and behaviors, and employee health as they relate to foodborne illness.
- **Managers are required to report to the Department of Environmental Health** when two or more employees experience either diarrhea, or vomiting in conjunction with diarrhea.

Environmental Health Specialists will work with managers to ensure that ill food employees are excluded or restricted from working in job tasks that could result in the spread of illness.

**If any food employee contracts any of the above noted illnesses,
immediately notify the County of Santa Clara
Department of Environmental Health.
(408) 918-3400**

CROSS-CONTAMINATION

- ❖ ***Bacteria from raw foods can contaminate cooked or ready-to-eat foods.***
- ❖ ***Keep raw meats, fish, and poultry separate from other foods.***
- ❖ ***Sanitize food contact surfaces.***

Cross-contamination occurs when bacteria from raw foods contaminates cooked foods or other foods that will be eaten raw. Cross-contamination **COMMONLY OCCURS** when raw meat or poultry juices or blood get into a food, onto a food contact surface (e.g., counter, cutting board, meat slicer, utensils), or onto a food worker's hands, and the bacteria is then transferred to other foods.



TO PREVENT CROSS-CONTAMINATION

- ✓ **It is critical to keep raw food separate from any cooked or ready-to-eat food.**
- ✓ **Do not store raw meats, raw poultry, or raw seafood above any cooked or ready-to-eat food.**
- ✓ **Do not store food, food containers, or food contact utensils in ice intended for human consumption.**
- ✓ **Store raw foods on the lowest shelf or in a separate area.**
- ✓ **Wash and sanitize all food contact surfaces frequently.**

PROTECTING DISPLAYED FOODS

- ❖ ***Use sneeze guards or tight-fitting, attached covers over all ready-to-eat self-service foods.***
- ❖ ***Tongs, scoops, or spoons should be provided for all self-service foods to minimize customer handling.***

All food displayed for self-service must be within easy reach of the consumer, yet must be protected from potential contamination by the same consumer. Sneeze guards serve as barriers to foods that are on display. These devices block contaminants which may be expelled from a customer's mouth. Devices such as food containers that have tight-fitting, attached lids or covers may also be used to effectively protect displayed foods.

Serving utensils such as tongs, spoons, and ladles must be provided for all self-service food displays so that customers do not handle the foods that are on display.

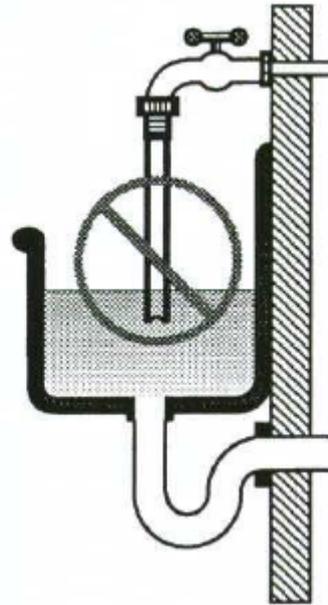
OTHER MEASURES THAT CAN MINIMIZE FOOD CONTAMINATION

- ❖ *Water supply cross-connection control.*
- ❖ *Light fixtures with shatterproof shields.*

CROSS CONNECTION CONTROL

The water supply to a food facility must be potable as well as protected against mixing with any non-potable water supply or other source of pollution. A cross-connection occurs when water or other liquid from an unapproved or unsafe source enters the potable drinking water supply. Approved back-flow prevention devices must be installed wherever necessary to eliminate cross-connections.

Examples of common cross-connections include attaching a hose to a sink faucet or extending an equipment drainline (e.g., ice machine) directly into a floor-sink or floor drain.



LIGHT FIXTURES

Light fixtures and exposed light bulbs in areas where food is prepared or stored, where utensils are washed or where there is nonprepackaged ready-to-eat food, clean equipment, utensils, linens and unwrapped single-use articles must be adequately protected to prevent physical contamination of these items if the fixture or bulb were to break or explode. Acceptable methods of protection include the use of:

- shatterproof bulbs.
- shatterproof plastic sleeves with end caps for fluorescent tubes.
- shatterproof construction such as light fixtures that are "caged", recessed, or otherwise shielded from breakage.

FOOD STORAGE

- ❖ ***Cover food to protect from overhead contamination.***
- ❖ ***Follow the "first in - first out" rule.***
- ❖ ***Store foods off the floor at least 6 inches.***

Stored foods must be protected from all sources of contamination. Except for foods being cooled, all stored foods must be covered. Except for large bulk containers, and unopened cartons of cans and glass bottles, all foods must be stored up off the floor at least 6 inches on shelves, pallets, or dollies for easy cleaning of floors. Do not store any food or food contact items in any way that may allow them to become contaminated.

FOLLOW THESE SIMPLE FOOD STORAGE RULES:

- ✓ FIFO — Stick to the "first in-first out" (FIFO) rule. Rotate stock. Date all goods upon receipt and place new deliveries behind those already in storage.
- ✓ All food, food contact items, and beverages must be stored up off the floor at least 6 inches or on movable pallets, racks, or dollies.
- ✓ Do not store original shipping cartons above open foods, clean equipment, utensils, linens, or single-use articles, or food preparation surfaces. Dirt, rocks, glass, metal, etc. from the bottom of shipping cartons can fall onto and contaminate items stored below.
- ✓ Store all goods in clean, undamaged wrappers, packages, or containers until use.
- ✓ Store all bulk food in its original container. Once opened, transfer food to a food grade, rigid container with a tight fitting lid. Label all food containers as to contents.
- ✓ Clean bulk containers routinely and always before refilling. Clean container lids and handles daily.
- ✓ Store foods intended to be eaten raw, or foods previously cooked, ABOVE raw meats, poultry, seafood, and unwashed produce.
- ✓ Store all damaged goods, returned goods, and unlabeled goods in a separate area until returned to the manufacturer or discarded. Do not allow spoils to contaminate other food, equipment, utensils, linens or single-use articles, or to contribute to a vermin problem. Keep spoils contained and keep the area clean.
- ✓ Keep storage areas clean and dry. Keep food carts, racks, and dollies clean.
- ✓ Do not store food, single-use articles such as paper or plastic eating and drinking utensils, or clean equipment and linens in toilet rooms or other areas that may allow contamination.

Remember the basic rule — WHEN IN DOUBT, THROW IT OUT!

STORAGE OF EQUIPMENT, UTENSILS, LINENS, AND SINGLE-USE ARTICLES

❖ *Protect from contamination.*

❖ *Minimize handling.*

Storage of clean equipment, utensils, linens, and single-use articles should be organized to protect food contact surfaces from ANY source of contamination.

- ✓ Store all equipment, utensils, linens, and single-use articles in a clean and dry area.
- ✓ Do not store any of these items in restrooms.
- ✓ Keep these items off the floor at least 6 inches to protect from dust and splash.
- ✓ Store them away from water, sewer pipes, or overhead plumbing.
- ✓ Do not store below open stairwells.

Cups and glasses should be stored on clean surfaces and stored upside down to prevent handling of the rim. Store eating utensils with just their handles exposed to eliminate touching the eating surfaces. All clean food containers must be stored upside down on a clean surface to prevent contamination.

During use, food dispensing utensils such as ladles, scoops, and knives must also be stored to prevent contamination. Food dispensing utensils should be cleaned and sanitized at regular intervals. During use, the following methods may be used to minimize the potential for contamination:

- ✓ Wash and dry utensils between each use.
- ✓ Store utensils in a dipperwell with running water.
- ✓ Store utensils in the food, with only the handle extending out of the food and above the top of the container.

IMPORTANT: Utensils used for serving potentially hazardous foods must either be cleaned after each use, or stored between uses in the food at the required temperature to avoid bacterial growth. Other methods of storing in-use utensils, such as on work surfaces, may be approved. Contact your District Environmental Health Specialist for more information.

UNAPPROVED FOOD UTENSILS, STORAGE CONTAINERS, AND TABLEWARE

Some containers are not approved for contact with food. The possibility of food contamination or foodborne illness exists if unapproved or dangerous containers are used for food storage, display, or service. The major problem with unapproved food utensils and containers is poisoning from metals such as cadmium, lead, zinc, or antimony.

The following types of utensils and containers ***MUST NOT BE USED*** for food storage, display, or serving:

- Copper and brass containers — for foods that are acidic (pH below 6.0).
- Galvanized containers such as garbage or trash cans.
- Enamelware and porcelain — it may be plated or coated over a hazardous metal. Enamelware may also chip exposing the under layer of metal and the enamel chips act like small "razors" creating a physical hazard if swallowed.
- "Paint brushes" used to baste foods. Metals can be leached from contact with acidic foods, and brushes are of an unsanitary construction. Use only NSF approved chef basting-brushes.
- Refrigerator shelving used as barbecue grills or for "direct contact" storage of unwrapped meats.
- Pottery, stoneware, or ceramicware that is labeled "not intended for food use." Such items could contain a high lead concentration.
- Any utensil that is chipped, dented, or deteriorated.
- Containers that previously held chemicals or cleaners — toxic compounds can be transferred from the container into the food.
- Black or colored plastic trash bags are not acceptable for food use — use only "food-grade" white or clear plastic bags for food storage.

REQUIREMENTS FOR FOOD CONTACT SURFACES AND UTENSILS

All materials used in the construction of food contact surfaces, such as food utensils, storage containers, and tableware, must not allow any dangerous substance to "migrate" into the food that is placed on or in these items. These materials must not create odors, discolorations, or tastes in the food that is placed on or in them.

All utensils must be substantial enough to withstand repeated washing and heavy commercial use, and be resistant to chips, scratches, or other deterioration. They must also be smooth and be free of cracks, pits, and other imperfections.

CHEMICAL STORAGE

- ❖ ***Store all chemicals away from food, equipment, utensils, linens and single-use articles.***
- ❖ ***Properly label all chemical containers.***
- ❖ ***Keep chemicals in their original containers.***

Cleaners, pesticides, and sanitizers are examples of chemicals commonly found in food facilities. These chemicals are toxic compounds that can cause serious illness if they become mixed with food.

All toxic compounds must be kept in containers with the manufacturers' identification labels — these labels provide information on the specific contents, use, and safety precautions for the chemicals. Cleaners, sanitizers, or other toxic compounds transferred from their original container into spray bottles **MUST** be properly labeled as to contents — always keep the original bulk container from the manufacturer readily available in the food facility.



REMEMBER

- ✓ **Always store toxic compounds in an area separated from all foods, food equipment, food contact surfaces and utensils, linens and single-use articles such as plastic or paper food contact items (food wrappers, napkins, cups, plates, eating utensils, drinking straws).**
- ✓ **Always store toxic compounds on the lowest shelf possible.**
- ✓ **Do not store chemicals in any food preparation area.**

PESTS AND PESTICIDES

- ❖ *Always read the pesticide label before use.*
- ❖ *Store pesticides away from food, equipment, utensils, linens and single-use articles.*
- ❖ *Do not allow pesticides to contaminate food, equipment, utensils, linens and single-use articles or any food contact surfaces.*

Pesticides used to kill insects and rodents are also poisonous to humans. Use only those pesticides approved for use in food facilities and always follow the **exact** label instructions. The pesticide container label will indicate the following:

- ✓ if it is approved for use in a restaurant or other food facility.
- ✓ the manner in which the pesticide can be used in a food facility.

PEST CONTROL

Rats, mice, cockroaches, and flies are all carriers of disease. These pests have instincts to seek food and shelter — **DO NOT** provide these disease carriers any source of food or shelter in your facility!

To minimize rodent and insect problems:

- ✓ Clean your facility routinely. Clean up all food wastes promptly. Clean up all equipment areas — eliminate grease, food waste, and wastewater.
- ✓ Exclude pests by plugging entry holes and screening windows and doors. Seal around all pipes and conduits. Install exterior door thresholds to minimize the opening between the floor and the door (do not allow any gaps greater than 1/4 inch). Provide rodent-proof grates for all floor sinks and floor drains.
- ✓ Keep equipment, cabinets, shelves, walls, and ceilings in good repair. Seal all holes, cracks, and crevices. Discard unused or old equipment.
- ✓ Inspect all incoming food deliveries, especially cardboard boxes, for rodent or insect activity. Discard boxes and cartons promptly.
- ✓ Store foods in original containers or in containers with tight fitting lids — do not overfill food containers.
- ✓ Put all food waste in plastic bags and seal tightly. Remove garbage regularly. Store garbage in clean covered containers.
- ✓ Keep exterior areas clean and free of food particles and food scraps.

If a rodent or insect problem exists in your facility, contact the Department of Environmental Health at (408) 918-3400 for advice, and obtain the services of a professional pest control company.

FOOD SECURITY

The potential for intentional contamination of our food supply has always been present; however, the recent rise in terrorist activity has focused new attention on this possibility. To minimize the threat to your customers and to your business, **food security** should now become an important part of your overall **food safety** plan. The following suggestions will enhance security in your facility and may reduce the potential for food contamination due to a terrorist incident.

FOOD PREP AND STORAGE AREAS

- Limit access by unauthorized persons.
- Know your employees and who should be working in each area.
- Lock exterior doors and windows (but don't block fire exits!).
- Randomly inspect your food facility for security "gaps."
- Identify and eliminate security "gaps."

FOOD SOURCES AND SUPPLIES

- Know your suppliers and delivery personnel; know their vehicles.
- Check-in all deliveries; consider a sign-in log for delivery persons.
- Inspect all food and packages for signs of "spoilage" or tampering.
- Do not accept unattended "drop" shipments.
- Maintain records for all food product purchases and all deliveries.

DISPLAYS, SALAD BARS, BUFFETS, & RETAIL AREAS

- Develop a plan to continually monitor these areas.
- Do not refill a partly empty food container; instead, replace with a new, clean container of fresh food.
- Do not allow customers to re-use dishes at self-serve displays.
- If tampering is suspected, remove and isolate the food product.
- Handle foods returned by customers as though they may be contaminated.

EMPLOYEES

- Screen new employees; check references.
- Provide food safety and food security training.
- Supervise all employees; restrict personal items from work areas.

VISITORS

- Check identification and use a sign-in log.

APPROVED SOURCES OF FOOD

- ❖ ***Obtain food from approved sources only.***
- ❖ ***No home food preparation or storage allowed.***

All food and food ingredients served to the public must be from sources approved by the Department of Environmental Health. For example, meats must be USDA approved, canned products must be processed by commercial canneries, unpasteurized milk and milk products must be from certified raw dairies, shell eggs must be from approved sources, and shellfish must have federal and/or state approval.

All food preparation for public consumption must be done at a location that has a valid Department of Environmental Health Permit to Operate. No food preparation for service to the public is allowed in private homes or other unpermitted facilities. Approved kitchens must be available for inspection by the Department to assure sanitary food preparation and storage, and a safe food product.

ADULTERATED AND UNWHOLESOME FOOD

- ❖ ***Food that is unfit to eat.***
- ❖ ***When in doubt, throw it out.***

Food that is adulterated or unwholesome is not safe to eat and **cannot** be served to the public. Examples of adulterated or unwholesome food include any food that is:

- ✓ from a swollen can.
- ✓ moldy.
- ✓ contaminated by insects or rodents.
- ✓ spoiled.
- ✓ contaminated by raw meat or poultry juices.



A GOOD RULE TO FOLLOW:

WHEN IN DOUBT, THROW IT OUT!

**DON'T TAKE CHANCES
WITH YOUR CUSTOMER'S HEALTH!**

RECEIVING

Check each product you receive — don't accept the delivery of foods which could cause a foodborne illness outbreak!

- ✓ Make sure all food is from an approved source.
- ✓ Check product temperature on all potentially hazardous foods. Do not accept a delivery if the product arrives at an improper temperature. Remember the temperature danger zone is between 41°F and 135°F.
- ✓ Check all meats, poultry, and fish for proper temperature, color, odor, texture, and packaging.
- ✓ Check meats and poultry for USDA inspection service markings.

Seafood Deliveries

- ✓ Fresh seafood products should be received at 35°F or less. They should be free of any strong, fishy odor; eyes should be bulging and clear; gills should be red and moist; and flesh and belly should be firm and elastic. An ammonia odor is a sign of advanced deterioration.
- ✓ Frozen seafood products should arrive at 0°F or less. Fish intended for raw or lightly cooked consumption should always be from a frozen supply (held at -4°F for 3 days) to eliminate the hazards of parasitic worms.
- ✓ Shellfish can be shipped either live, fresh, frozen, whole, in-shell, half-shell, or shucked. All molluscan shellfish (oysters, clams, mussels and scallops — except if consisting of the shucked adductor muscle only) must come from certified sources and identification tags must accompany delivery of shellstock. Leave shellfish ID tags on the delivery box or bag until empty — ID tags must be kept on file in an organized manner in your facility for 90 days after receipt.

Dairy Product Deliveries

- ✓ All dairy products must be pasteurized or be from a certified raw dairy.
- ✓ Liquid dairy products must be used by the manufacturer's "pull date" or expiration date indicated on the carton.
- ✓ Cheese must be refrigerated as potentially hazardous food unless it qualifies as a hard, hard-grating, pasteurized processed cheese, cheese food, or cheese spread.

Frozen Food Deliveries

- ✓ The temperature of frozen food should not exceed 0°F.
- ✓ Check for signs of thawing and refreezing such as fluid or frozen liquids at the bottom of cartons, or the presence of large ice crystals in the product itself.

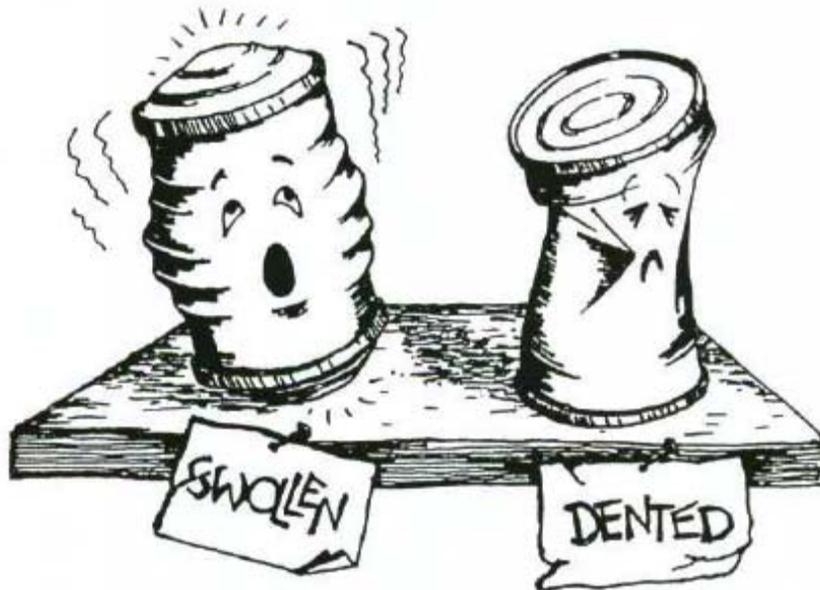
Dry Food Deliveries

- ✓ Check that containers of dry goods are dry and undamaged. Most dry goods do not promote the growth of bacteria unless they become moist.
- ✓ Check for punctures or tears in packaging — this may indicate insect or rodent entry points. Food contaminated by insects or rodents must be discarded.

Canned Food Deliveries

Botulism is a potentially lethal form of foodborne illness associated with canned foods.

- ✓ Inspect cans carefully and reject for the following:
 - Swelling — *check top and bottom of can.*
 - Leakage
 - Heavily rusted
 - Severely dented — *especially rim and seam dents.*
 - Flawed seals — *check top, bottom, and side seams.*
- ✓ Do not use food from any can that appears abnormal in odor, color, or texture.



NEVER TASTE FOOD FROM A SUSPECT CAN!

**People have died from tasting and spitting out
foods contaminated with botulism toxin.**

Modified-Atmospheric Packaged Food Deliveries

Modified-atmospheric packaging (MAP) such as vacuum packaging and sous-vide processing results in an oxygen-free atmosphere which provides the conditions necessary for the growth of the organism that can cause **botulism**.

- ✓ Check that packages are from an approved supplier.
- ✓ Check that packaging is intact. Be sure the vacuum is still present on packages that are vacuum sealed.
- ✓ Check if vacuum packages contain any bubbles — this could indicate a break in the vacuum seal.
- ✓ Check puff packages (pillow packs) for possible leaks.
- ✓ Check manufacturers' requirements for transport and delivery temperatures.
- ✓ All potentially hazardous foods must be maintained at the correct temperatures — below 41°F or above 135°F.

FOOD ADDITIVES

- Sulfiting agents may not be added at retail facilities. Sulfiting agents include sulfur dioxide, sodium and potassium bisulfite, sodium and potassium metabisulfite, and sodium sulfite.
- Monosodium glutamate (MSG) should be added in small quantities only. MSG may be added to foods, however, it should be used sparingly since many people have an allergic reaction to it — the use of MSG should be noted on your menu.

Chapter 6 CLEANING AND SANITIZING

SANITIZE FOOD CONTACT SURFACES

- ❖ ***Sanitize after each use.***
- ❖ ***Sanitize at the beginning of the day and again at the end of the day.***
- ❖ ***Sanitize whenever contaminated.***

To prevent cross-contamination, all food contact utensils and other food contact surfaces should be cleaned and sanitized after each use — this includes knives, cutting boards, meat slicers, and all other equipment and utensils used in the preparation and service of foods.

- ✓ Use an approved dishwashing method to clean and sanitize utensils and equipment.
- ✓ After proper washing and rinsing, use a clean wiping cloth dipped in a solution containing 100 ppm available chlorine to sanitize work surfaces, equipment, and large utensils. (A 200 ppm quaternary ammonium solution can also be used.)

NOTE: scented bleach may not be labeled for use as a sanitizer or disinfectant, and therefore, should not be used for these purposes.

WIPING CLOTHS

- **Keep clean.**
- **Rinse in sanitizer solution.**
- **Store in sanitizer solution.**

Wiping cloths must be treated as another "food contact utensil" and must be kept clean and sanitary at all times. Clean wiping cloths dipped in a sanitizer solution are effective in killing bacteria that contribute to foodborne illness. A dirty wiping cloth, even with a sanitizer solution, can actually contaminate work surfaces and spread dangerous bacteria! When a wiping cloth becomes dirty, it must be laundered before re-use. Always store wiping cloths in sanitizer solution when not in use.

To make an effective sanitizing solution for wiping cloths:

- ✓ Maintain a sanitizing solution with a chlorine concentration of 100-200 parts per million (ppm) OR a quaternary ammonia compound concentration of 200 ppm. **DO NOT** exceed the maximum concentration—too strong a solution can be toxic!
- ✓ Use 1 tablespoon household bleach in 1 gallon of cool water.
- ✓ Do not use any soap in a sanitizing solution.
- ✓ Change the solution frequently to maintain effectiveness and help keep wiping cloths clean.

APPROVED DISHWASHING STEPS

- ❖ *Wash with an approved dishwashing soap or detergent.*
- ❖ *Rinse in clear water. Change rinse water frequently.*
- ❖ *Sanitize in an approved sanitizing solution.*
- ❖ *Air dry. Thoroughly dry all utensils before stacking.*

MANUAL DISHWASHING

The steps to be followed in manual dishwashing include:

- ✓ Remove all excess food and grease before washing.
- ✓ Use a 3-compartment sink —
 - Compartment #1 Wash using hot water (120°F at faucet) and detergent to remove solids.
 - Compartment #2 Rinse using clean warm water to remove soil and detergent residue.
 - Compartment #3 Sanitize using an approved chemical sanitizer for the required length of time to destroy any remaining bacteria. Methods approved for manual sanitizing include:
 - a) contact with a solution of 100 ppm available chlorine for 30 seconds.
 - b) contact with a solution of 25 ppm available iodine for 1 minute.
 - c) contact with a solution of 200 ppm quaternary ammonium for 1 minute.
 - d) contact with 171°F water for 30 seconds.
- ✓ Always air dry all equipment and utensils to complete the dishwashing process. Towel drying is not allowed as this may contaminate the clean equipment and utensils. ***Be sure all utensils are completely dry before stacking and storing.***

DISHWASHING MACHINES

All new and replacement mechanical dishwashing equipment must meet, or be equivalent to, applicable NSF International (NSF) standards. Check with the Department of Environmental Health before installing any mechanical dishwashing unit.

**All multi-use customer dishes AND kitchen utensils
used with any food MUST be:
Washed — Rinsed — Sanitized — AIR DRIED.**

GENERAL CLEANING

- ❖ *Clean throughout the facility.*
- ❖ *Clean throughout the day.*

General cleaning should be done on a continuous and constant basis. Cleaning of floors and walls should be done during periods when the least amount of food is exposed.

A dirty kitchen is never acceptable! Even on the busiest day, a kitchen should always be operated in a clean and sanitary manner. Safety hazards and the potential for accidents will be reduced when employees are working in a safe, clean, and orderly environment.

CLEANING SCHEDULE

A detailed cleaning schedule that addresses all areas of your facility should be written and posted in an area readily visible to all employees.

The cleaning schedule should include:

- ✓ daily activities such as cleaning of all cooking surfaces and work surfaces.
- ✓ weekly activities such as cleaning of an oven interior.
- ✓ timetables for cleaning walls, ventilation hoods, and the moving of equipment to get at hard-to-reach areas.



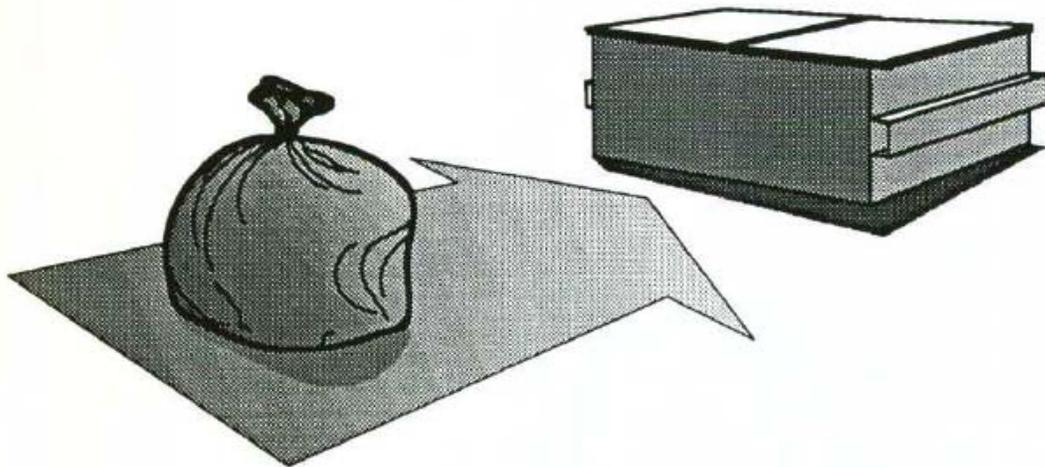
**“CLEAN AS YOU GO”
is a valuable rule to follow!**

GARBAGE AND TRASH DISPOSAL

Garbage is wet waste, usually from food, that can attract and provide shelter and food for insects and rodents. Garbage can create odor problems and has the potential to contaminate food, equipment, utensils, linens and single-use articles.

Follow these rules regarding garbage:

- ✓ All food waste and trash containing food waste must be kept in leakproof, flytight, and rodent-proof containers with tight-fitting lids. Indoor trash containers may be left uncovered during periods of operation.
- ✓ Durable plastic bags are to be used to dispose of all wet garbage. Bags must be sealed before placing in a dumpster or garbage can.
- ✓ All food waste and trash must be removed and disposed of in a sanitary manner as often as necessary to prevent a nuisance. Do not allow old equipment, pallets, shelving, and similar unusable items to accumulate — keep premises free of accumulated debris.
- ✓ Garbage should be removed from food areas as quickly as possible. Garbage containers should not be located in the facility so as to contaminate food, equipment, utensils, linens and single-use articles.
- ✓ Garbage containers must be washed and sanitized routinely. The wash location must not allow any contamination of food or food contact surfaces, and must allow for the sanitary disposal of wastewater.



Chapter 7

GLOSSARY

- ❖ *The following terms are important to all food employees.*
- ❖ *Knowing their meaning will help you prepare and serve food safely.*

APPROVED SOURCE means a food product (or water supply) acceptable to the Department of Environmental Health. Water and ice used in a food facility must be from an approved water supply.

CROSS-CONTAMINATION occurs when bacteria from raw foods contaminate cooked foods, ready-to-eat foods, or foods eaten raw. Bacteria can be transferred by dirty surfaces, utensils, equipment, or employee hands. An example of cross-contamination includes a food service worker cutting raw chicken, then cutting cooked chicken on the same cutting board without cleaning and sanitizing the cutting board between steps.

EQUIPMENT means an article that is used in the operation of a food facility, including but not limited to, a freezer, grinder, hood, icemaker, meat block, mixer, oven, reach-in refrigerator, scale, food and utensil shelving and cabinets, sink, slicer, stove, table, temperature measuring device for ambient air, vending machine, or warewashing machine.

LINENS means fabric items such as cloth hampers, cloth napkins, tablecloths, wiping cloths, and work garments, including cloth gloves.

PERISHABLE FOODS are those moist foods that deteriorate or spoil due to the growth of molds and spoilage bacteria. Perishable foods are not necessarily potentially hazardous foods (PHFs). Examples of perishable foods include breads, fresh fruits, and vegetables.

pH (or ACIDITY) is important in determining food safety. The acidity of a food is one factor which can determine if a food item will support the growth of foodborne illness causing bacteria. Foods high in acid, such as pickles, fruit juices, and sauerkraut generally limit the growth of bacteria. Foods low in acid allow growth of foodborne illness causing bacteria. Low acid foods are potentially hazardous and must be kept at or below 41°F, or at or above 135°F at all times to limit the growth of bacteria. Examples of LOW acid foods include meats, most vegetables, and ripened fruit.

POTABLE WATER is water that does not contain objectionable pollution, contamination, minerals, or infective agents, and is considered satisfactory for drinking.

POTENTIALLY HAZARDOUS FOODS (PHFs) allow the rapid growth of bacteria that may cause foodborne illness. Potentially hazardous foods must be kept COLD (at or below 41°F) or HOT (at or above 135°F) at all times to limit the growth of bacteria. Examples of potentially hazardous foods include eggs, meat, poultry, fish, shellfish, dairy products, tofu, baked potatoes, refried beans, and cooked rice, and some produce items such as cut melons, alfalfa and clover sprouts.

SINGLE-SERVICE or SINGLE-USE ARTICLES (disposable items) are cups, containers, plates, lids, napkins, drinking straws, stir sticks, and eating utensils intended for one-time, one-person use. These items are to be disposed of after just one use.

WATER ACTIVITY (a_w) is the amount of moisture available in a food for bacterial growth. A minimum amount of moisture is needed for bacteria to multiply — without moisture bacteria cannot survive. Potentially hazardous foods contain enough water activity (adequate moisture) to support the growth of potentially dangerous bacteria. Example of foods with LOW water activity (which does not support bacterial growth) include pepperoni, beef jerky, bread, unfilled cake, and parmesan cheese.

ACKNOWLEDGEMENTS and REFERENCES

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Product Temperature Management

D.L. Lancaster