

TABLE OF CONTENTS

<b>Introduction 1</b>
<b>Introduction to Food Safety 2</b>
<b>Receiving Foods 4</b>
<b>Storage of Food 8</b>
<b>Hazards to Our Health 11</b>
<b>Food Allergies 12</b>
<b>Microbiology of Foods 13</b>
<b>Common Foodborne Illnesses 18</b>
<b>Personal Hygiene 22</b>
<b>Food Preparation 24</b>
<b>Cooking, Hot Holding, Cooling &amp; Reheating 25</b>
<b>Cleaning and Sanitizing 31</b>
<b>HACCP Food Protection System 35</b>
<b>Pest Control 38</b>
<b>Plumbing 48</b>
<b>Operating a Temporary Food Service Establishment 51</b>
<b>Required Postings 53</b>
<b>Reduced Oxygen Packaging 55</b>
<b>Local Laws 56</b>
<b>NYC Health Code Extracts 58</b>
<b>Food Defense Strategies 60</b>
<b>Trans Fat 62</b>
<b>Workplace Safety and Health 66</b>
<b>Form 198E Food Establishment Inspection Report 69</b>
<b>Quizzes 75</b>
<b>Numbers to Remember 79</b>
<b>Work Sheets 83</b>



DEPARTMENT OF HEALTH & MENTAL HYGIENE

P R O T E C T I O N  
T R A I N I N G  
M A N U A L



If you have questions or comments regarding this manual, please call the Health Academy at (917) 492-6990. Other telephone numbers and addresses are listed below.

**If you wish to contact:**

**OATH – HEALTH TRIBUNAL**

66 John Street, 11th Floor  
NY, NY 10038

☎ (212) 361-1000

**BUREAU OF FOOD SAFETY & COMMUNITY SANITATION**

125 Worth Street, 9th & 10th Floors  
Box CN-59A, NY, NY 10013  
Food Safety:

☎ (212) 676-1600

Community Sanitation:

☎ (212) 676-1651

**CITYWIDE LICENSING CENTER**

42 Broadway  
NY, NY 10004

☎ (212) 487-4436

**HEALTH ACADEMY**

413 East 120 Street  
2nd Floor  
NY, NY 10035

☎ (917) 492-6990

**INSPECTOR GENERAL**

80 Maiden Lane  
NY, NY 10005

☎ (212) 825-2141

**RESTAURANT WORKER SAFETY AND HEALTH**

☎ (212) 788-4290

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New York City Department of Health and Mental Hygiene  
Division of Environmental Health  
125 Worth Street  
New York, NY 10013

## INTRODUCTION

**T**he New York City Department of Health and Mental Hygiene has the jurisdiction to regulate all matters affecting health in the city and to perform all those functions and operations that relate to the health of the people of the city.

### The Health Code

These are regulations that were formulated to allow the Department to effectively protect the health of the population. Among the rules embodied in the Health Code is Article 81 which regulates the operations of food establishments for the purpose of preventing public health hazards.

### Environmental Health Division

The Division of Environmental Health is the Commission within the Health Department that is concerned with public health and works to eliminate the incidence of injury and illness caused by environmental factors.

There are several Offices and Bureaus within this division. One of these is the Bureau of Food Safety and Community Sanitation that has the responsibility for conducting inspections of food service and food processing establishments. These inspections are performed by Public Health Sanitarians.

### Anti-corruption Warning

All Sanitarians have Department of Health and Mental Hygiene badges and identification cards which they must display whenever it is requested of them.

It is illegal to offer a Sanitarian any bribe, gratuity or reward for official misconduct; this is a crime

that can result in fines, and /or imprisonment, and the revocation of permits. Also, Sanitarians are not authorized to conduct any monetary transactions on behalf of the Department.

### Inspector General

This is an office that exists within the Health Department with the responsibility of investigating any incidence of alleged corrupt activity. Investigations may be conducted as a result of complaints by employees of the Department or members of the public.

### Health Academy

The Health Academy is an office within the Division of Environmental Health. One of its responsibilities is to provide training and certification courses for individuals from the public as mandated by the Health Code. The Food Protection Course is one of the courses taught here. The Food Protection Course is required by the Health Code for supervisors of food service establishments and non-retail food processing establishments. These individuals must take the course and pass an examination before a certificate is issued to them. A person holding such a certificate must be on the premises and supervise all food preparation activities during all hours of operation. Several supervisors with

this certification may be needed at an establishment to have coverage during all shifts, vacations or illnesses.

The *Food Protection Manual* has been designed to assist participants of the course to better understand the principles of safe food handling. It serves as a reference for food service operators and it includes the necessary information to pass the final examination.

### On-Line Food Protection Course

The *Food Protection Course* in English, Spanish and Chinese is now also available on-line. This course is designed for individuals with busy schedules to study at their convenience. After the completion of the course, a final examination is scheduled at the Health Academy. Registration is done on-line. The link is: [nyc.gov/foodprotectioncourse](http://nyc.gov/foodprotectioncourse)

### Register for Health Academy Classes On-Line

You may now register and pay online for courses offered at the Department of Health and Mental Hygiene's Health Academy, including the Food Protection Course for restaurants. This new service allows you to avoid going to the Citywide Licensing Center to register for a course. You may also use the on-line service to pay for and request an appointment to replace your Food Protection Certificate.

### How does it work?

Go to the registration web page, [nyc.gov/healthacademy](http://nyc.gov/healthacademy), select a course and date, pay the appropriate fee and receive confirmation.

You will be asked to provide some personal information before registering. In most cases, you will be able to select from a list of course dates. If you don't see a date that is convenient, check back as new course dates are added frequently.

## QUICK REVIEW

1. All food service establishments must have a current and valid permit issued by the NYC Health Department.  
☐ TRUE ☐ FALSE
2. Health Inspectors have the right to inspect a food service or food processing establishment as long as it is in operation. Inspectors must be given access to all areas of establishment during an inspection. ☐ TRUE ☐ FALSE
3. Health Inspectors are authorized to collect permit fees and fines on behalf of the Department. ☐ TRUE ☐ FALSE
4. Health Inspectors must show their photo identification and badge to the person in charge of an establishment.  
☐ TRUE ☐ FALSE
5. According to the NYC Health Code, who is required to have a Food Protection Certificate? \_\_\_\_\_.

## INTRODUCTION TO FOOD SAFETY

The United States has one of the safest food safety systems in the world, yet millions of Americans still get sick each year from eating contaminated foods; hundreds of thousands are hospitalized; and several thousand die. This means that there is still tremendous room for improvement in food safety standards.

Most food-borne illnesses are caused by improper handling of food. The statistics from the Centers for Disease Control (CDC) show that some of the most common causes of foodborne illness are:

- ◆ Sick food worker
- ◆ Poor personal Hygiene/Bare hand contact
- ◆ Improper holding temperatures
- ◆ Improper cooling
- ◆ Inadequate cooking and reheating
- ◆ Cross contamination
- ◆ Use of food from unknown source

### What is Food-Borne Illness?

Any illness that is caused by food is called food-borne illness. A food-borne illness outbreak is defined as any incident involving two or more persons becoming ill with similar symptoms from the same source. Typically these illnesses are a direct result of contamination of food by harmful microorganisms, (commonly called germs) such as bacteria,

viruses, parasites, fungi etc. Injury and illness caused by foreign objects, dangerous chemicals and/or allergens in food is also considered a food-borne illness.

### Who is at Risk?

We are all at risk of getting a food borne illness; however, the effects are more severe for certain categories of individuals:

- ◆ Children whose immune system (human body's defense system against diseases) is not fully developed yet.
- ◆ Elderly individuals because their immune system is not robust anymore and has weakened due to old age.
- ◆ Pregnant women where the threat is both to the mother and the fetus.
- ◆ Individuals with compromised immune systems e.g., Patients with AIDS, cancer or individuals who are diabetics, etc.
- ◆ People on medication (antibiotics, immunosuppressant, etc.).

### What is food?

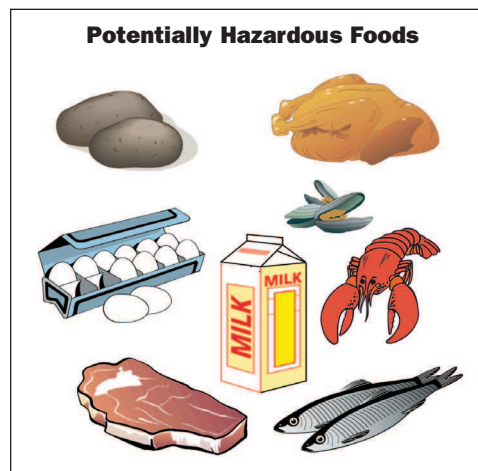
Food is any edible substance, ice, beverage, or ingredient intended for use and used or sold for human consumption.

## What are Potentially Hazardous Foods (PHF)?

This expression refers to those foods that provide suitable conditions for rapid growth of microorganisms. These include foods that are high in protein like raw or cooked animal products such as meats, poultry, fish, shellfish (mollusks as well as crustaceans), milk and milk products (cheese, butter milk, heavy cream etc.), plant protein such as tofu, and starches such as cooked rice, cooked pasta, cooked beans and cooked vegetables like potatoes, cut melons, cut leafy greens, cut tomatoes or mixtures of cut tomatoes, as well as raw seed sprouts and garlic in oil.

*Exceptions: Those foods that have a low water activity (.85 or less) or those that are highly acidic with a pH of 4.6 or below. Air-cooled hard-boiled eggs with shells intact.*

### Potentially Hazardous Foods



## What is Ready-To-Eat Food?

Any food product that does not need additional heat treatment or washing is called ready-to-eat food. Extra care must be taken to ensure the safety of these foods.

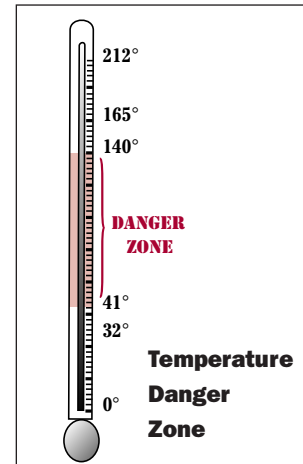
## Where do we purchase foods?

All foods must be purchased from approved sources. These are manufacturers and suppliers who comply with all the rules and regulations that pertain to the production of their product, including having the

necessary permits to operate. The use of foods prepared at home or in an unlicensed establishment is prohibited.

## The Temperature Danger Zone?

Most microorganisms that cause foodborne illness typically grow best between temperatures of 41°F and 140°F. This is commonly referred to as the *temperature danger zone*. One of the basic and simplest ways to keep food safe is by keeping it out of the temperature danger zone.

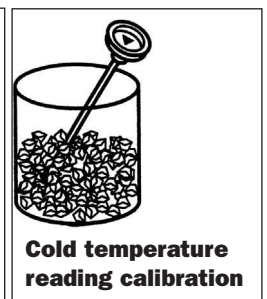
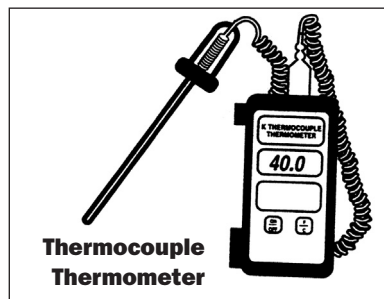
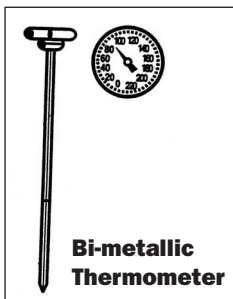


## How do we store potentially hazardous foods?

All foods must be kept free from adulteration, spoilage, filth or other contamination in order to be suitable for human consumption. Potentially hazardous foods are of particular concern because they provide the conditions suitable for the growth of microorganisms. These foods must be kept either hot or cold to prevent microorganisms from growing. Hot means 140°F or above and cold means 41°F or below. The temperature range between 41°F and 140°F is known as the **temperature danger zone**. It is within this range that microorganisms are comfortable and will grow rapidly. At 41°F and below, the temperature is cold enough to retard or slow down the growth of microorganisms, while above 140°F most of the microorganisms which cause foodborne illness begin to die.

## Thermometers

The only safe way to determine that potentially hazardous foods are kept out of the temperature danger zone is by the use of thermometers. There are several different types of thermometers. The bi-metallic stem is the most popular type. It is fairly inexpensive, easy to use, accurate to + or – 2°F and easy to re-calibrate.



Also, it is available within the range of 0° to 220°F making it ideal for measuring the required temperatures in a food establishment.

Another thermometer in use is the thermocouple which is very accurate but fairly expensive. Lastly, there is a thermometer called thermistor, which has a digital read out and is commonly called "digital thermometer."

These thermometers are used by inserting the probe into the thickest part or the geometric center of the food item being measured. The stem thermometer must remain in the food until the indicator stops moving before the reading is taken and must be re-calibrated periodically to assure accuracy.

## Calibration

Thermometers must be calibrated to ensure their accuracy. For thermocouple thermometers, follow the instructions provided by the manufacturer. For some thermistor thermometers, placing the thermometer

in 50/50 solution of ice and water or boiling water, and hitting the "reset" button will automatically calibrate the thermometer. Bi-metallic stem thermometers may be calibrated by two methods:

## Boiling-Point Method Ice-Point method

### Boiling-Point Method

- ♦ Bring water to a boil.
- ♦ Place the thermometer probe (stem) into the boiling water. Make sure that the thermometer probe does not touch the bottom or sides of the pan. Wait until the indicator stops moving, then record the temperature.
- ♦ If the temperature is 212°F, do nothing, the thermometer is accurate. (This is the temperature of boiling water at sea level.)
- ♦ If the temperature is not 212°F, rotate the hex-adjusting nut using a wrench or other tool until the indicator is at 212°F.

## Ice-Point Method

- ♦ Fill a container with ice and water to make a 50/50 ice water slush.
- ♦ Stir the slush.
- ♦ Place the thermometer probe so that it is completely submerged in the ice-water slush, taking care not to touch the sides or the bottom. Wait until the indicator needle stops moving, then record the temperature.
- ♦ If the temperature is 32°F, do nothing, the thermometer is accurate. (A 50/50 ice water slush will always have a temperature of 32°F at sea-level.) If the temperature is not 32°F, rotate the hex-adjusting nut until the indicator needle is at 32°F.

## How to use a Thermometer

The following describes the proper method of using thermometers:

- ♦ Sanitize the probe by the use of alcohol wipes. This is a fairly safe and common practice. Other methods such as immersion in water with a temperature of 170°F for 30 seconds or in a chemical sanitizing solution of 50 PPM for at least one minute, or swabbing with a chlorine sanitizing solution of 100 PPM are also acceptable.
- ♦ Measure the internal product temperature by inserting the probe into the thickest part or the center of the product. It is recommended that the temperature readings be taken at several points.
- ♦ Whenever using a bi-metallic thermometer, ensure that the entire sensing portion – from the tip of the probe to the indentation on the stem, is inserted in to the food product.
- ♦ Wait for roughly 15 seconds or until the reading is steady before recording it.
- ♦ Clean and sanitize the thermometer for later use.

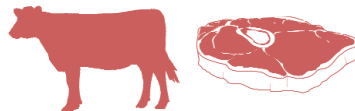
## RECEIVING FOODS

The first opportunity one has to ensure that food is safe is at the point of receiving. At this point care must be taken to ensure that all products come from approved sources and/or reliable and reputable suppliers. Incoming supplies must be received at a time when it is convenient to inspect them and place them into storage promptly. There are various qualities and conditions one should look for in different food items.



### Lamb

Lamb, like beef, may have an inspection stamp as well as a grade stamp. When fresh, it is light red in color and has no objectionable odor and the flesh is firm and elastic. Fresh lamb is received at 41°F and frozen at or below 0°F. (See stamps below)



### Beef

Incoming supplies of beef can be received either fresh or frozen. Fresh beef should be at 41°F or below while frozen beef should be at 0°F or below. Beef should be bright to dark red in color with no objectionable odor. To ensure that the supply is from an approved source, look for the United States Department of Agriculture inspection stamp. This can be found on the sides of the beef carcass or on the box when receiving portions of the carcass. This inspection is mandatory and the stamp indicates that the meat is sanitary, wholesome and fit for human consumption. Also found may be a grade stamp which attests to the quality of the meat and will certainly have an impact on its price. The inspection stamp is the more important of the two stamps.



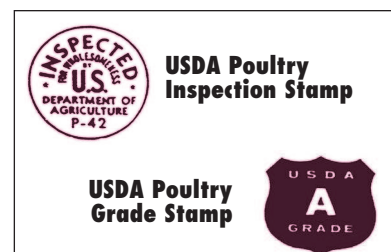
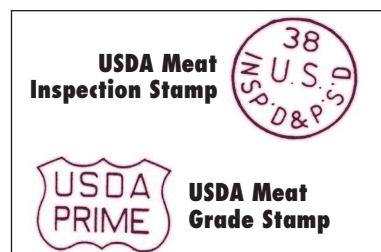
### Pork

Pork is also subject to USDA inspection. The flesh is light colored while the fat is white. A good way to check for spoilage is to insert a knife into the flesh all the way to the bone and check the blade for any off odors. (See stamps below)

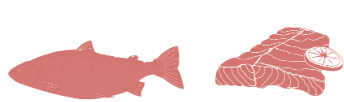


### Chicken and Poultry

Chicken and poultry are subject to USDA inspection which must be verified by the inspection stamp. (See stamps below) These must be received either fresh at 41°F and below or frozen at 0°F or less, as they are naturally contaminated with the micro-organism Salmonella which must be kept under control.







## Fresh fish

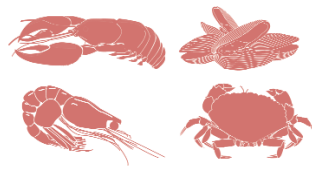
There is no inspection for fresh fish other than what can be done by sight and touch and one's sense of smell. This makes it more important to purchase supplies from reputable and reliable suppliers. Fresh fish must be received cold and on ice, 41°F or less, with no objectionable odor. The eyes must be clear and bulging, the gills bright red and the flesh firm and elastic. Fish that is spoiling will have a fishy odor; the eyes cloudy, red rimmed and sunken; the gills grey or greenish; the flesh will pit on pressure and can easily be pulled away from the bones; the scales are loose.



## Smoked fish

Smoked fish provide ideal conditions for the growth of Clostridium botulinum spores if left at room temperature. Therefore, upon receipt, all smoked fish must be stored at 38°F or below.

It is important to adhere to the temperature requirements stated on the label.



## Shellfish

Shellfish is the term used to describe clams, mussels, and oysters. These belong to the family of mollusks. They are filter feeders, that is, they absorb water from their environment, filter out whatever nutrients are there and then expel the water. Feeding in this manner causes them to absorb and accumulate harmful microorganisms from polluted waters. Since the whole shellfish is eaten either raw or partially cooked, it is critical to ensure that they are harvested from safe waters. It is important to buy shellfish from reputable suppliers who can provide the shipper's tags which identify the source of the shellfish. These tags supply the following information:

- ♦ The name of the product
- ♦ The name of the original shipper
- ♦ The address of the original shipper
- ♦ The interstate certificate number of the original shipper
- ♦ The location of the shellfish harvesting area.

When purchasing small amounts from a retailer, a tag must be provided. This is a split-lot tag which

has all the information that is on the original tag.

The shellfish tag is required to be kept together with the product, then whenever the product is used up, it must be kept for 90 days in order of delivery. The virus Hepatitis A is associated with shellfish.

Check if the shellfish is alive. An opened shell may be an indication of dead shellfish. Gently tap on the shell, if the shell closes then it is alive otherwise it's dead and should be discarded. Both alive as well as shucked shellfish (shellfish that has been removed from its shell) must only be accepted if delivered at a temperature of 41°F or below. Following conditions would automatically be grounds for rejection:

- ♦ Slimy, sticky or dry texture
- ♦ Strong fishy odor
- ♦ Broken shells

## Other Shellfish

Lobsters, crabs and shrimps belong to the family of crustaceans. Fresh lobsters and crabs must be alive at the time of delivery. As with other seafood, a strong fishy odor is an indication of spoilage. The shell of the shrimp must be intact and firmly attached. All processed crustacean must be delivered at 41°F or below.



## Eggs

Eggs produced outside of New York State are inspected by the U.S. Department of Agriculture while those produced within the State are inspected by the New York State Department of Agriculture and Markets. In either case, inspected eggs will be identified by a stamp on the carton. Eggs have long been

**Split Lot Tag**

**SPLIT LOT TAG**  
SHELLFISH DREGGED FROM

BED NO. \_\_\_\_\_

SHIPPER'S CERT. NO. \_\_\_\_\_

DATE \_\_\_\_\_

ORIGINAL PACKAGE CONSISTED OF \_\_\_\_\_

Reshipper's CERT. NO. \_\_\_\_\_

DATES RESHIPPED \_\_\_\_\_

N. Y. 27

This Tag is required by law to be kept on container until empty and thereafter kept on file for 90 days.

**Shellfish Tag**

**MUSSELLS**

PACKED BY  
ADRIAN APPOHANS, R. I.  
TAG NUMBER T-00000

Shelfish Obtained From:  
Local Area - Dutch Island Harbor  
Bed No. - Natural  
Date \_\_\_\_\_

To Be Detached by Reshipper for 90 Days.  
Shelfish's Cert. No. R. I. - 30

**SPARE**

THIS PACKAGE CONSISTS OF  
**MUSSELLS**

Shelfish Obtained From:  
Local Area - Dutch Island Harbor  
Bed No. - Natural  
Date \_\_\_\_\_

It is strongly recommended that the invoices be kept with the tags to aid in tracing the lot's history.

associated with the micro-organism *Salmonella enteritidis*. This bacterium has been found on the inside of the egg, so external washing does not make eggs safe.

Eggs should be bought from suppliers who deliver them in refrigerated trucks and upon receipt, these eggs must be kept refrigerated at an ambient temperature of 45°F until they are used.



## Pasteurized Eggs

Pasteurization is a method of heating foods to destroy harmful microorganisms. Pasteurized eggs come in many forms: intact shell eggs, liquid eggs, frozen eggs, or in powdered form. Even though these have been pasteurized, they still require refrigeration to slow down growth of spoilage microorganisms to extend the shelf life. Only the powdered pasteurized eggs may be held at room temperature.



## Milk and Milk Products

Only accept Grade A pasteurized milk and milk products. Harmful pathogens such as *Listeria monocytogenes*, *E.coli* 0157:H7 and *Salmonella spp.* are commonly associated with un-pasteurized milk.

The expiration date on pasteurized milk and milk products must not exceed nine calendar days from date of pasteurization, while ultra

pasteurized milk and milk products must not exceed 45 days from date of ultra pasteurization.

Upon receipt, these products must be checked to ensure that they are well within the expiration period and that they are at 41°F or below. This temperature must be maintained until the product is used up.



## Fresh Fruits and Vegetables

The acceptable condition of fruits and vegetables vary from one item to another. As a general rule of thumb, only accept those that do not show any signs of spoilage. Reject any produce that shows signs of decay, mold, mushiness, discoloration, wilting, and bad odors.

A recent study done by the center for Science in the Public Interest (CSPI) found that contaminated fruits and vegetables are causing more foodborne illness among Americans than raw chicken and eggs combined. Most fresh produce may become contaminated with *Salmonella* and *E.coli* 0157:H7 due to the use of manure fertilizer (more common in South and Central America, which is a major source of fresh produce to the United States).

Fresh produce must be thoroughly washed prior to being served raw. This includes all kinds of fruits and vegetables including produce that has a hard rind that is typically not consumed, for example,

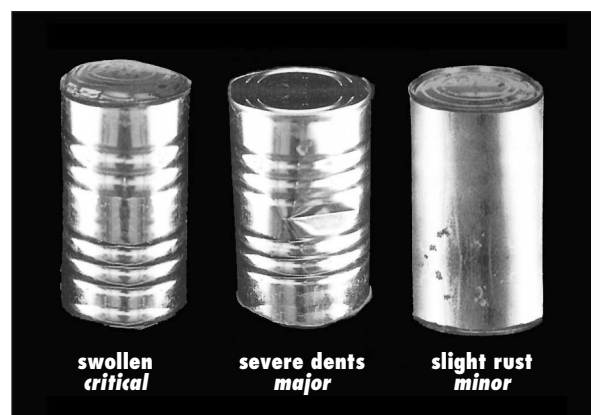
watermelons, cantaloupes, honeydews and all varieties of melons, oranges, etc. Only potable running water should be used to thoroughly wash these produce, and the use of produce scrubbing brushes is strongly recommended.



## Canned Goods

It is a simple task to inspect canned goods and remove from circulation those cans that can cause foodborne illness. The first step is to ensure that home canned foods are not used in a food service establishment. All canned foods must be commercially processed. A good can is free from rust and dents, properly sealed and labeled and slightly concave at both ends.

A can with a dent on any of the three seams (top, bottom or side) must be removed from circulation. The same requirement is true for severely rusted, severely dented, leaking and cans with swollen ends. Bad cans may be rejected at delivery or segregated and clearly labeled for return to the supplier.







## Modified Atmosphere Packaged Foods

Various food items are packaged under special conditions to prolong their shelf life. These conditions include the following:

- ♦ Food is placed in a package and all the air is withdrawn: vacuum packaging.
- ♦ Food is placed in a package, all the air is withdrawn and gases are added to preserve the contents – **modified atmosphere packaging**.
- ♦ Food is placed in a package, all the air is withdrawn and the food

is cooked in the package: *sous vide* packaging.

Because of the absence of air, foods packaged in this manner provide ideal conditions for the growth of the *clostridium botulinum* micro-organism, unless they are refrigerated at temperatures recommended by the manufacturer.

These products must be provided by approved sources and care taken to preserve the packaging during handling and when taking the temperature.

Food establishments interested in making “modified atmosphere packaged foods” must first obtain permission from NYC DOHMH.

For more information, please see Page 54.



## Dry Foods

Dry foods such as grains, peas, beans, flour and sugar are to be dry at the time of receiving. Moisture will cause growth of molds and the deterioration of these products. Broken and defective packages will indicate contamination; as will the evidence of rodent teeth marks.

Whenever these products are removed from their original containers, they must be stored in tightly covered, rodent-proof containers with proper labels.

## Refrigerated and Frozen Processed Foods

For convenience as well as cutting down on costs, there has been a greater shift towards using prepared pre-packaged refrigerated or frozen foods. These routinely include deli and luncheon meats, refrigerated or frozen entrees, etc. Care should be taken when receiving these products to ensure quality as well as safety. Following are some guidelines:

- ♦ Ensure that refrigerated foods are delivered at 41°F or below. (Except, as noted previously, smoked fish must be received at 38° F or lower.)
- ♦ Ensure that frozen foods are delivered at 0°F or lower.
- ♦ All packaging must be intact.
- ♦ Any frozen food packaging that shows signs of thawing and refreezing should be rejected. Signs include liquid or frozen liquids on the outside packaging, formation of ice crystals on the packaging or on the product, and water stains.

### QUICK REVIEW

1. The term “potentially hazardous food” refers to foods which do not support rapid growth of microorganisms. ☐ TRUE ☐ FALSE
2. Home canned food products are allowed in commercial food establishments. ☐ TRUE ☐ FALSE
3. The Temperature Danger Zone is between 41°F and 140°F. ☐ TRUE ☐ FALSE
4. Within the Temperature Danger Zone, most harmful microorganisms reproduce rapidly. ☐ TRUE ☐ FALSE
5. Shellfish tags must be filed in order of delivery date and kept for a period of \_\_\_\_\_ days.
6. Fresh shell eggs must be refrigerated at an ambient temperature of: \_\_\_\_\_°F.
7. Foods in Modified Atmosphere Packages provide ideal conditions for the growth of: \_\_\_\_\_
8. The recommended range of bi-metallic stem thermometer is: \_\_\_\_\_
9. Meat inspected by the U.S. Dept. of Agriculture must have a/an: \_\_\_\_\_ stamp.
10. Chicken and other poultry are most likely to be contaminated with: \_\_\_\_\_
11. Smoked fish provide ideal conditions for the growth of Botulinum spores. Therefore, this product must be stored at: \_\_\_\_\_°F
12. Safe temperatures for holding potentially hazardous foods are: \_\_\_\_\_°F or below and \_\_\_\_\_°F or above
13. What are the four types of defective canned products that must be removed from circulation? \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_
14. Which of the following is an indication that fish is not fresh?:  
☐ clear eyes ☐ fishy odor ☐ firm flesh

## STORAGE OF FOOD

After receiving the foods properly, they must be immediately moved to appropriate storage areas. The most common types of food storage include:

- Refrigeration storage
- Freezer storage
- Dry storage
- Storage in Ice

We will discuss each of these individually; however, certain aspects are common for all types of storage and are described below.

### FIFO

An important aspect of food storage is to be able to use food products before their “use-by” or expiration date. In this regard, stock rotation is very important. The common sense approach of **First in First out** (FIFO) method of stock rotation prevents waste of food products and ensures quality. The first step in implementing the FIFO method of stock rotation is to *date products*. Marking the products with a date allows food workers to know which product was received first. This way, the older stock is moved to the front, and the newly received stock is placed in the back.

### Cross Contamination

When harmful microorganisms are transferred from one food item to another, typically, from raw foods to cooked or ready to eat foods, it is termed cross contamination. This expression also applies in any situation where contamination from one object crosses over to another. Cross contamination may also occur between two raw products, for instance, poultry juices falling on raw beef will contaminate it with Salmonella, which is typically only associated with poultry and raw eggs.

### Storage Containers

It is always best to store food in their original packaging; however, when it is removed to another container, take extra care to avoid contamination. Only use food containers that are clean, non-absorbent and are made from food-grade material intended for such use. Containers made from metal may react with certain type of high acid foods such as sauerkraut, citrus juices, tomato sauce, etc. Plastic food-grade containers are the best choice for these types of foods. Containers made of copper, brass, tin and galvanized metal should not be used. The use of such products is prohibited.

Re-using cardboard containers to store cooked foods is also a source of contamination. Lining containers with newspapers, menus or other publication before placing foods is also prohibited as chemical dyes from these can easily leach into foods.

### Storage Areas

Foods should only be stored in designated areas. Storing foods in passageways, rest rooms, garbage areas, utility rooms, etc. would subject these to contamination. Raw foods must always be stored below and away from cooked foods to avoid *cross contamination*.

### Refrigerated Storage

This type of storage is typically used for holding potentially hazardous foods as well as perishable foods for short periods of time—a few hours to a few days.

An adequate number of efficient refrigerated units are required to store potentially

hazardous cold foods. By keeping cold foods cold, the microorganisms that are found naturally on these foods are kept to a minimum. **Cold temperature does not kill microorganisms, however, it slows down their growth.**

Pre-packaged cold foods must be stored at temperatures recommended by the manufacturer. This is especially important when dealing with vacuum packed foods, modified atmosphere packages and *sous vide* foods. Smoked fish is required by the Health Code to be stored at 38°F or below.

Fresh meat, poultry and other potentially hazardous foods must be stored at 41°F or below, while frozen foods must be stored at 0°F or below. For foods to be maintained at these temperatures, refrigerators and freezers must be operating at temperatures lower than 41°F and 0°F, respectively. Thermometers placed in the warmest part of a refrigerated unit are necessary to monitor the temperature of each unit.

The rule of storage, **First In First Out (FIFO)** ensures that older deliveries are used up before newer ones. In practicing FIFO, the very first step would be to **date all products as they are received**. The next step is to store the newer products behind the older ones.

The following rules are important in making sure that foods are safe during refrigerated storage:

- ◆ Store cooked foods above raw foods to avoid cross-contamination.
- ◆ Keep cooked food items covered unless they are in the process of cooling, in which case they must be covered after being cooled to 41°F.
- ◆ Avoid placing large pots of hot foods in a refrigerator. This will cause the temperature of the refrigerator to rise and other foods will be out of temperature.



- ◆ Store foods away from dripping condensate, at least six inches above the floor and with enough space between items to encourage air circulation.

## Freezer Storage

Freezing is an excellent method for prolonging the shelf life of foods. By keeping foods frozen solid, the bacterial growth is minimal at best. However, if frozen foods are thawed and then refrozen, then harmful bacteria can reproduce to dangerous levels when thawed for the second time. In addition to that, the quality of the food is also affected. Never re-freeze thawed foods, instead use them immediately. Keep the following rules in mind for freezer storage:

- ◆ Use First In First Out method of stock rotation.
- ◆ All frozen foods should be frozen solid with temperature at 0°F or lower.
- ◆ Always use clean containers that are clearly labeled and marked, and have proper and secure lids.
- ◆ Allow adequate spacing between food containers to allow for proper air circulation.
- ◆ Never use the freezer for cooling hot foods.

**Tip:** When receiving multiple items, always store the frozen foods first, then foods that are to be refrigerated, and finally the non perishable dry goods.

## Dry Storage

Proper storage of dry foods such as cereals, flour, rice, starches, spices,

canned goods, packaged foods and vegetables that do not require refrigeration ensures that these foods will still be usable when needed. Adequate storage space as well as low humidity (50% or less), and low temperatures (70 °F or less) are strongly recommended. In addition to the above, avoid sunlight as it may affect the quality of some foods. Following are some of the guidelines:

- ◆ Use First In First Out method of stock rotation.
- ◆ Keep foods at least 6 inches off the floor. This allows for proper cleaning and to detect vermin activity.
- ◆ Keep foods in containers with tightly fitted lids.
- ◆ Keep dry storage areas well lighted and ventilated.
- ◆ Install shades on windows to prevent exposure from sunlight.
- ◆ Do not store foods under overhead water lines that may drip due to leaks or condensation.
- ◆ Do not store garbage in dry food storage areas.
- ◆ Make sure that dry storage area is vermin proof by sealing walls and baseboards and by repairing holes and other openings.

**Safety Tip:** Storage of harmful chemicals in the food storage areas can create hazardous situations and hence is prohibited by law. All chemicals must be labeled properly and used in accordance to the instructions on the label. Pesticide use is prohibited unless used by a licensed pest control officer.

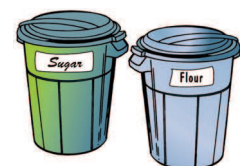
## Storage in Ice

Whenever food items are to be stored in ice, care must be taken to ensure that water from the melted ice is constantly being drained so that the food remains on ice and not immersed in iced water.

Furthermore, it is improper to store food in ice machines or ice that will be later used for human consumption.

## FOOD STORAGE REVIEW

- ◆ Food should be stored at least six inches off the floor, away from walls and dripping pipes.
- ◆ Keep all food, bulk or otherwise, covered and safe from contamination.
- ◆ Check food daily and throw away any spoiled or contaminated food.
- ◆ Store cleaning, disinfecting, and other chemicals away from foods, clearly marked and in their original containers.
- ◆ Keep food refrigerated at a temperature of 41°F or below.
- ◆ Monitor temperatures regularly with a thermometer placed in the warmest part of the refrigerator.
- ◆ Keep all cooling compartments closed except when you are using them.
- ◆ Store food in a refrigerator in such a way that the air inside can circulate freely.
- ◆ Keep all refrigerated foods covered, and use up stored leftovers quickly.
- ◆ When dishes and utensils are sparkling clean, keep them that way by proper storage. Keep all cups and glasses inverted.
- ◆ Cakes, doughnuts and fruit pies may be kept inside a covered display area.
- ◆ The only goods that should be left on the counter uncovered are those which are individually wrapped and not potentially hazardous.
- ◆ Do not set dirty dishes, pots, cartons or boxes on food tables.
- ◆ Whenever products are removed from their original containers, store them in tightly covered, rodent proof containers with labels.



## RECOMMENDED STORAGE OF FOOD

### Refrigerator and Freezer Storage Chart

Since product dates aren't a guide for safe use of a product, consult this chart and follow these tips.

These short but safe time limits will help keep refrigerated food 41° F (5°C) from spoiling or becoming dangerous.

- Purchase the product before "sell-by" or expiration dates.
- Follow handling recommendations on product.
- Keep meat and poultry in its package until just before using.
- If freezing meat and poultry in its original package longer than 2 months, overwrap these packages with airtight heavy-duty foil, plastic wrap, or freezer paper, or place the package inside a plastic bag.

Because freezing 0° F (-18° C) keeps food safe indefinitely, the following recommended storage times are for quality only.

Product	Refrigerator	Freezer	Product	Refrigerator	Freezer
<b>Eggs</b>			<b>Soups &amp; Stews</b>		
Fresh, in shell	4 to 5 weeks	Don't freeze	Vegetable or meat-added & mixtures of them	3 to 4 days	2 to 3 months
Raw yolks, whites	2 to 4 days	1 year			
Hard cooked	1 week	Don't freeze well	<b>Bacon &amp; Sausage</b>		
Liquid pasteurized eggs or egg substitutes, opened	3 days	Don't freeze	Bacon	7 days	1 month
unopened	10 days	1 year	Sausage, raw from pork, beef, chicken or turkey	1 to 2 days	1 to 2 months
Mayonnaise, commercial			Smoked breakfast links, patties	7 days	1 to 2 months
Refrigerate after opening	2 months	Don't freeze	Summer sausage labeled "Keep Refrigerated," unopened	3 months	1 to 2 months
			opened	3 weeks	1 to 2 months
<b>TV Dinners, Frozen Casseroles</b>			<b>Fresh Meat (Beef, Veal, Lamb, &amp; Pork)</b>		
Keep frozen until ready to heat		3 to 4 months	Steaks	3 to 5 days	6 to 12 months
<b>Deli &amp; Vacuum-Packed Products</b>			Chops	3 to 5 days	4 to 6 months
Store-prepared egg, chicken, tuna, ham, macaroni salads	3 to 5 days	Don't freeze well	Roasts	3 to 5 days	4 to 12 months
Pre-stuffed pork & lamb chops, chicken breasts stuffed w/dressing	1 day	Don't freeze well	Variety meats (tongue, kidneys, liver, heart, chitterlings)	1 to 2 days	3 to 4 months
Store-cooked convenience meals	3 to 4 days	Don't freeze well	<b>Meat Leftovers</b>		
Commercial brand vacuum-packed dinners with USDA seal, unopened	2 weeks	Don't freeze well	Cooked meat & meat dishes	3 to 4 days	2 to 3 months
			Gravy & meat broth	1 to 2 days	2 to 3 months
<b>Raw Hamburger, Ground &amp; Stew Meat</b>			<b>Fresh Poultry</b>		
Hamburger & stew meats	1 to 2 days	3 to 4 months	Chicken or turkey, whole	1 to 2 days	1 year
Ground turkey, veal, pork, lamb	1 to 2 days	3 to 4 months	Chicken or turkey, parts	1 to 2 days	9 months
			Giblets	1 to 2 days	3 to 4 months
<b>Ham, Corned Beef</b>			<b>Cooked Poultry, Leftover</b>		
Corned beef in pouch with pickling juices	5 to 7 days	Drained, 1 month	Fried chicken	3 to 4 days	4 months
Ham, canned, labeled "Keep Refrigerated," unopened	6 to 9 months	Don't freeze	Cooked poultry dishes	3 to 4 days	4 to 6 months
opened	3 to 5 days	1 to 2 months	Pieces, plain	3 to 4 days	4 months
Ham, fully cooked, whole	7 days	1 to 2 months	Pieces covered with broth, gravy	1 to 2 days	6 months
Ham, fully cooked, half	3 to 5 days	1 to 2 months	Chicken nuggets, patties	1 to 2 days	1 to 3 months
Ham, fully cooked, slices	3 to 4 days	1 to 2 months			
<b>Hot Dogs &amp; Lunch Meats</b>		(in freezer wrap)	<b>Fish &amp; Shellfish</b>		
Hot dogs, opened package	1 week	1 to 2 months	Lean fish	1 to 2 days	6 months
unopened package	2 weeks	1 to 2 months	Fatty fish	1 to 2 days	2 to 3 months
Lunch meats, opened package	3 to 5 days	1 to 2 months	Cooked fish	3 to 4 days	2 to 6 months
unopened package	2 weeks	1 to 2 months	Smoked fish	14 days	2 months
			Fresh shrimp, scallops, crawfish, squid	1 to 2 days	3 to 6 months
			Canned seafood	<i>after opening</i>	<i>out of can</i>
			Pantry, 5 years	3 to 4 days	2 months



## QUICK REVIEW

1. The acronym FIFO means: \_\_\_\_\_
2. The first step in implementing FIFO is to rotate the stock.  
☐ TRUE ☐ FALSE
3. The New York City Health code requires that all food items must be stored at least \_\_\_\_\_ off the floor.
4. In order to prevent cross-contamination, raw foods in a refrigerator must be stored \_\_\_\_\_ cooked foods.
5. Cold temperatures slow down the growth of microorganisms.  
☐ TRUE ☐ FALSE
6. Food for storage must be kept covered and/or stored in vermin-proof containers. ☐ TRUE ☐ FALSE
7. Ice intended for human consumption can be used for storing cans and bottles. ☐ TRUE ☐ FALSE
8. When foods are stored directly in ice, the water from that ice must be drained constantly. ☐ TRUE ☐ FALSE

Sulfites are used to maintain the color and freshness of cut fruits and vegetables.

Monosodium Glutamate (MSG) is used to enhance the flavor of foods.

Excessive use of sulfites and MSG have both resulted in serious allergic reaction among sensitive individuals. MSG is permitted in a food service establishment as long as it is disclosed on the menu, however, the use of sulfites is prohibited. Certain foods may contain sulfites when they are brought in but none may be added in a food service establishment.

## HAZARDS TO OUR HEALTH

Food borne illnesses are caused by the presence of foreign objects, chemicals and living organisms in our foods. These can be described as hazards to our health.

- ◆ Scouring pad (steel wool) wire
- ◆ Pieces of jewelry

*Any food item with a physical hazard must be discarded immediately.*

### Physical Hazards

The presence of a foreign object in food that can cause an injury or an illness is called a Physical Hazard. The common cause of a physical hazard is accidental and/or due to improper food handling practices by food workers. Food workers must be trained to handle foods safely so as not to contaminate foods. Food workers should not wear jewelry or any other personal effects that may accidentally fall into food items.

Some common examples include:

- ◆ Tiny pebbles that are sometimes found in rice, beans, and peas.
- ◆ Fragments of glass—from a broken glass, from scooping ice with the glass, from broken light bulb without protective shields, etc.
- ◆ Short, un-frilled toothpicks used to hold a sandwich together.
- ◆ Bandages
- ◆ Metal shavings from a worn can opener

### Chemical hazards

A chemical hazard may be in a food item either accidentally, deliberately or naturally.

A chemical may be introduced to a food **accidentally** by the careless use of insecticides, storing of cleaning and other chemicals next to open foods and the storage of acidic foods in metal containers.

These are the more common examples and may be avoided by:

- ◆ Using an experienced, licenced exterminator.
- ◆ Storing cleaning and other chemicals, including personal medication, away from foods, preferably in a locked cabinet.
- ◆ Storing acidic foods in containers made of food-grade plastic.

A chemical may be introduced into a food item **deliberately** to enhance its taste or appearance without realizing that it may cause consumers to become ill.

### Toxic metals

Utensils made from lead, copper, brass, zinc, antimony and cadmium are not permitted for use with food products. These can cause toxic-metal poisoning from the leaching of these chemicals into the food.

Similarly, containers previously designed to hold cleaning agents and other chemicals should never be used for food storage. Always ensure that food storage containers are made from food-grade materials.

### Biological Hazards

Biological hazards occur when disease-causing microorganisms such as **Bacteria**, **Viruses**, **Parasites** and **Fungi** end up contaminating our food supply. In addition to that, toxins found naturally in certain foods can also cause food borne illness.

Mushrooms are both poisonous and non-poisonous and they are difficult to tell apart. To be certain that a safe variety is being used, they must be purchased from a reliable commercial source.

Toxins in certain fish can also be a serious problem. Some fish have natural toxins, others accumulate toxins from their food, while yet



others develop toxins during storage. Puffer fish may contain tetrodotoxin and/or saxitoxin which can cause severe illness and death. These are central nervous system toxins and according to FDA, are 1,200 times more deadly than cyanide.

Certain predatory fish, such as the barracuda, feed on smaller fish which in turn feed on algae. Algae, during certain seasons and in certain

waters may be toxic. This toxicity accumulates in the smaller fish and then in the fish that eat the smaller fish. In this manner the *ciguatera*, which is not destroyed by cooking, may accumulate in fish and this leads to the illness **Ciguatera**.

**Scombroid poisoning** is a food borne illness caused by the consumption of marine fish from the *Scombridae* family: tuna, mackerel, and a few *non-Scombridae* relatives,

such as bluefish, dolphin and amberjacks. These fish have high levels of histidine in their flesh and during decomposition, the histidine is converted into histamine which causes consumers to suffer an allergic-like reaction. The symptoms of this illness, among other things, mimic a heart attack. *Histamine is not destroyed by cooking.*

## FOOD ALLERGIES

An allergy is a reaction to a food or ingredient that the body mistakenly believes to be harmful. Millions of Americans suffer from allergic reactions to food each year. Most of these food allergies are mild in nature, but some food allergies can cause severe reactions, and may even be life-threatening.

There is no cure for food allergies. Avoidance of food allergens and early recognition and management of allergic food reactions are crucial to prevent serious health consequences.

### Common Symptoms

Following are some of the common symptoms:

#### Mild

- Itching
- Wheezing
- Hives
- Swelling of face and eyes

#### Severe

- Loss of consciousness due to air way obstruction
- Death

### Eight Most Common Allergens

Although an individual could be allergic to any food product, such as

fruits, vegetables, and meats, however, the following eight foods account for 90% of all food-allergic reactions:

- Fish
- Peanuts
- Wheat
- Soy
- Tree Nuts
- Eggs
- Milk
- Shell Fish

Here's an easy way to remember them:

### Food Problems Will Send The EMS

These eight foods as well as any food that contains proteins from one or more of these foods are called "major food allergens" by law.

### Additives that Trigger Allergies

In addition to the foods listed above, some common additives of foods can also trigger an allergic reaction. Full disclosure of these on the menu is necessary. Following are some of the common food additives used in the food industry:

- ♦ Nitrites\*—added in meats for redness.
- ♦ Sulfites\*—added to dried and preserved fruits and vegetables for freshness.

- ♦ MSG – added to enhance the flavor of food.

*\* The use of Nitrites and Sulfites in the retail food industry is not permitted.*

### Hidden Ingredients

Sometimes a dish may contain a very insignificant amount of common allergens and only the chef may be aware of it. Never guess! Always ensure that a dish is 100% free of allergens. Review the ingredients list for every dish requested by the customers and check labels on packaged and ready-to-eat food products.

### Customer Safety

In order to protect the customers, it is important that there is full disclosure of the use of these eight common allergens to the customers. This can be done in the following manner:

- ♦ By describing details of menu items.
- ♦ When uncertain about any ingredient, inform the customer immediately.
- ♦ Ensure that food has no contact with ingredients to which customer is allergic. Even the smallest amount of allergen can cause a serious reaction.
- ♦ Wash hands thoroughly and use new sanitary gloves before

preparing dishes for guests with food allergy.

- ◆ Clean and sanitize all equipment, cooking and eating utensils, and food contact surfaces with hot soapy water before preparing allergen-free foods.
- ◆ Never use any equipment or utensils previously used to cook other foods.
- ◆ Never cook with oils that were used to prepare other foods. Heat does not destroy allergens.
- ◆ Look out for splashes and accidental spills.

It is important to remember that removing allergens from a finished dish, such as nuts, shellfish etc, does not make the dish safe.

*If a guest has an allergic reaction, call 911 immediately. To prevent future mistakes, find out what went wrong.*

## QUICK REVIEW

The presence of the following in food constitutes a physical hazard:

1. Pieces of glass ☐ TRUE ☐ FALSE
2. Metal shavings ☐ TRUE ☐ FALSE
3. Piece of wood ☐ TRUE ☐ FALSE
4. Pebbles and stones ☐ TRUE ☐ FALSE
5. MSG ☐ TRUE ☐ FALSE
6. Toothpick ☐ TRUE ☐ FALSE

The presence of the following in the food constitutes a chemical hazard:

7. Ciguatoxin ☐ TRUE ☐ FALSE
8. Prescription medicines ☐ TRUE ☐ FALSE
9. Roach spray ☐ TRUE ☐ FALSE
10. Hair ☐ TRUE ☐ FALSE
11. False fingernails ☐ TRUE ☐ FALSE
12. Hair dye ☐ TRUE ☐ FALSE
13. Sulfites can be used in food preparation as long as their use is disclosed on the menu. ☐ TRUE ☐ FALSE
14. Some wild mushrooms can be very toxic; therefore mushrooms must always be purchased from a reliable and trustworthy commercial source. ☐ TRUE ☐ FALSE
15. Use of MSG (Monsodium Glutamate) in foods is a very dangerous practice and is not allowed under any circumstances. ☐ TRUE ☐ FALSE

## MICROBIOLOGY OF FOODS — BACTERIA

In order to understand the reasons behind food sanitation practices, it is necessary to know a few facts about the microorganisms which cause food spoilage and foodborne disease.

### Bacteria

Bacteria, commonly called germs, are extremely small, plant-like organisms which must be viewed through a microscope in order to be seen. If 25,000 bacteria are placed in a line, that line would only be one inch long; one million could fit on the head of a pin. Like any living thing, bacteria require food, moisture and the proper temperature for growth. Most of them need air (these are called aerobes), but some can survive only in the absence of air (these are called anaerobes) and some can grow with or without air (these are called facultative).

Bacteria are found everywhere on the earth, in the air and in water. Soil abounds with bacteria which grow on dead organic matter.

### Shapes of Bacteria

One method of classifying bacteria is by their shape. All bacteria can be assigned to one of the following categories:

- ◆ **Cocci** are round or spherical in shape. While they are able to live alone, they often exist in groups. Single chains are called streptococci. Those which form a grape-like cluster are called staphylococci while those that exist in pairs are called diplococci.
- ◆ **Bacilli** are rod shaped. Some of these also congregate in the single chain form and are called streptobacilli.

- ◆ **Spirilla** are spiral or comma shaped.

### Spores

Some bacteria are able to protect themselves under adverse conditions by forming a protective shell or wall around themselves; in this form they are in the **non-vegetative stage** and are called spores. These bacterial spores can be likened to the seeds of a plant which are also resistant to adverse conditions.

During the spore stage bacteria do not reproduce or multiply. As soon as these spores find themselves under proper conditions of warmth, moisture and air requirement, they resume their normal **vegetative stage** and their growth. Since spores are designed to withstand rigorous conditions, they are difficult to destroy by normal methods. Much higher killing temperatures and longer time periods are required. Fortunately,

there are only a relatively few pathogenic or disease causing bacteria which are spore-formers. Tetanus, anthrax and botulism are diseases caused by spore-formers.

## Bacterial Reproduction

Bacteria reproduce by splitting in two; this is called binary fission. For this reason, their numbers are always doubling: one bacterium generates two; each of these generates another two resulting in a total of four and the four become eight and this goes on and on.

The time it takes for bacteria to double (generation time) is roughly **twenty to thirty minutes** under favorable conditions.

## Types of Bacteria According to Their Effect on Humans

Types of bacteria classified according to their effect on us are:

- ♦ **Harmful** or disease-causing bacteria are known as pathogenic bacteria or pathogens. They cause various diseases in humans, animals and plants.
- ♦ **Undesirable** bacteria which cause decomposition of food are often referred to as spoilage bacteria.
- ♦ **Beneficial** bacteria are used in the production of various foods including cultured milk, yogurt, cheese and sauerkraut.
- ♦ **Benign** bacteria, as far as we know at the present time, are

neither helpful nor harmful to humans. Of the hundreds of thousands of strains of bacteria, most fall in this category.

It must be realized that many bacteria are essential in the balance of nature thus the destruction of all bacteria in the world would be catastrophic. Our main objective is public health protection through the control and destruction of pathogenic (disease causing) bacteria and those that cause food spoilage.

## Bacterial Growth

Bacteria require certain conditions in order to multiply. They need moisture, warmth, nutrients and time. It is rapid bacterial multiplication that often causes problems with regard to the safety of a food product. Under ideal conditions rapid growth can mean that **one organism can become two in as little as 20–30 minutes**.

The Bacterial Growth Curve table assumes that a certain food initially contains 1,000 organisms. The ideal rapid growth takes place during the log phase and all bacteria will reach this rapid part of their growth if given the correct conditions. Bacteria begin their growth cycle by adjusting to any new environment or condition by being in a resting or lag phase. Stationary and death phases are usually brought about by the depletion of available nutrients and the production of their waste.

## Conditions Necessary for the Growth of Bacteria (FATTOM)

- ♦ **Food**—Bacteria require food for growth. The foods that they like the most are the same ones we do. These are generally

## Growth of Bacteria

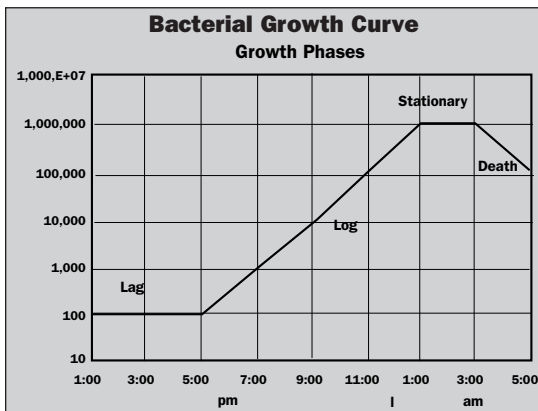
Time	Number of Organisms
30 minutes later	2,000
1 hour later	4,000
1½ hours later	8,000
2 hours later	16,000
2½ hours later	32,000
3 hours later	64,000
3½ hours later	128,000
4 hours later	256,000

high protein foods of animal origin, such as meat, poultry, fish, shellfish, eggs, milk and milk products. They also love plant products that are heat treated, such as cooked potato, cooked rice, tofu, and soy protein foods.

- ♦ **Acidity**—Bacteria generally prefer neutral foods. They do not fare well in foods that are too acidic or too alkaline. This is why vinegar is used as a preservative. Acidity is measured in pH. Any food with a pH value of 4.6 or less is considered too acidic for bacteria to grow, therefore, these foods are relatively safer.

## pH Values of Some Popular Foods

Product	Approximate pH range
Ground beef	5.1 to 6.2
Ham	5.9 to 6.1
Fish (most species)	6.6 to 6.8
Clams	6.5
Oysters	4.8 to 6.3
Crabs	7.0
Butter	6.1 to 6.4
Buttermilk	4.5
Cheese	4.9 to 5.9
Milk	6.3 to 7.0
Yogurt	3.8 to 4.2
Vegetables	3.1 to 6.5
Fruits	1.8 to 6.7
Orange juice	3.6 to 4.3
Melons	6.3 to 6.7
Mayonnaise (commercial)	3.0 to 4.1



♦ **Temperature**—In general, bacteria prefer warm temperatures. Those that prefer our food grow between 41–140°F (Temperature Danger Zone). This temperature range includes normal body temperature and usual room temperature. However, different types of bacteria prefer different temperatures.

**Mesophilic Bacteria** grow best at temperatures between 50–110°F. Most bacteria are in this group.

**Thermophilic Bacteria** prefer heat and grow best at temperatures between 110–150°F or more.

**Psychrophilic Bacteria** prefer cold and grow at temperatures below 50°F.

One way to control the growth of bacteria is to ensure that they are not within the **Temperature Danger Zone** (See Page 2).

♦ **Time**—Bacteria require time to grow and multiply. When conditions are favorable, one bacterium will split and become two every twenty to thirty minutes. Thus, the more time they have, the more bacteria will be produced. The simplest way of controlling bacteria is to minimize the time foods stay in the **temperature danger zone**.

♦ **Oxygen**—Some bacteria need oxygen from the air in order to grow; these are called *aerobes*. Others prefer it when there is no air or oxygen; these are called *anaerobes*. There are yet others that will thrive whether oxygen is present or not; these are called *facultative aerobes* or *facultative anaerobes*.

♦ **Moisture**—Bacteria need moisture or water in order to survive. Food is absorbed in a liquid form through the cell wall. If moisture is not present in sufficient quantity,

bacteria will eventually die. Bacteria can be controlled by removing moisture from foods by the processes of dehydration, freezing and preserving in salt or sugar.

The amount of moisture in a food is measured by **Water Activity** value. Any food with a Water Activity value of .85 or less does not have enough moisture to support the active growth of bacteria.

## Locomotion

Bacteria cannot crawl, fly or move about. A few types do have thread-like appendages called flagella with which they can propel themselves to a very limited extent. Therefore they must be carried from place to place by some vehicle or through some channel.

The modes of transmission include: air, water, food, hands, coughing, sneezing, insects, rodents, dirty equipment, unsafe plumbing connections and unclean utensils. Hands are one of the most dangerous vehicles. There is no doubt that if food workers would take better care of their hands then the incidence of foodborne disease would be reduced greatly.

## Destruction by Heat

The most reliable and time-tested method of destroying bacteria is the use of heat. This method is most effective when both time and temperature factors are applied. In other words, not only do we have to reach the desired temperature to destroy bacteria, but we must allow sufficient time to permit the heat to kill the more sturdy ones. The lower the temperature of the heat applied, the longer the time required to kill bacteria; conversely, the higher the

## Water Activity of Some Popular Foods

Food	Water Activity
Fresh fruits	.97 to 1.0
Pudding	.97 to .99
Bread	.96 to .97
Cheese	.95 to 1.0
Fresh meat	.95 to 1.0
Cakes	.90 to .94
Cured meat	.87 to .95
Jam	.75 to .80
Honey	.54 to .75
Dried fruit	.55 to .80
Chocolate candy	.55 to .80
Caramels	.60 to .65
Dried milk	.20
Dried vegetables	.20
Crackers	.10

temperature, the less time is necessary. An example of this principle involves the two accepted methods for pasteurizing milk. In the “holding” method, milk is held at a temperature of 145°F for thirty minutes while in the “flash” or “high temperature short time” method, milk is held at 161°F for fifteen seconds.

## Destruction by Chemicals

Bacteria can be destroyed by chemical agents. Chemicals that kill bacteria are called germicides or bactericides. Examples are carbolic acid, formaldehyde, iodine, chlorine and quaternary compounds. The effectiveness of a bactericide depends on the concentration used. When used to kill pathogenic (disease-causing) organisms, it is called a sanitizer. The most popular sanitizer used in the food industry is chlorine.

## Other Methods of Destruction

When exposed to air and sunlight, bacteria are destroyed due to the combined effects of the lack of moisture and exposure to the ultraviolet rays of the sun.

## Refrigeration

Refrigeration of foods does not destroy the bacteria already present. Cold temperatures from 0°F to

41°F will inhibit or slow the growth of bacteria. Thus, a food item will still be safe after several days in a refrigerator but not indefinitely.

Freezing foods at or below 0°F will further slow or even stop the growth of bacteria but will not kill them.

## MICROBIOLOGY OF FOODS — OTHER MICROORGANISMS

### Viruses

Viruses are minute organic forms which seem to be intermediate between living cells and organic compounds. They are smaller than bacteria, and are sometimes called filterable viruses because they are so small that they can pass through the tiny pores of a porcelain filter which retain bacteria. They cannot be seen through a microscope (magnification of 1500x), but can be seen through an electron microscope (magnification of 1,000,000x). Viruses cause poliomyelitis, smallpox, measles, mumps, encephalitis, influenza, and the common cold. Viruses, like bacteria, are presumed to exist everywhere.

**Unlike bacteria, viruses cannot reproduce in the food. Food only serves as a reservoir and a transporting mechanism until it is ingested.** Once viruses invade our body, they use our cells to duplicate themselves. Most often, the presence of viruses in food supply is an indication of contamination through human feces. Food worker's poor personal hygiene – for instance, not washing hands thoroughly after using the toilet, is a major cause of these viral infections. The two most common types of viruses in the food industry are Hepatitis A, and Noroviruses (previously known as Norwalk Virus). Noroviruses have been recently implicated in various food borne illness outbreaks involving cruise ships. Noroviruses are

highly contagious and can spread very quickly. Hepatitis A virus can be fatal as it affects the liver.

### Parasites

Parasites are organisms that live in or on other organisms without benefiting the host organisms. Parasites are not capable of living independently. The two most common parasites that affect the food industry include *trichinella spiralis*, which is commonly associated with pork, and the round Anisakid worm that is associated with many species of fish. With the growing interest in eating raw marinated fish such as sushi, sashimi, ceviche etc., there is an increased risk of illnesses such as *Anisakiasis*.

### Yeasts

Yeasts are one-celled organisms which are larger than bacteria. They, too, are found everywhere, and require food, moisture, warmth, and air for proper growth. Unlike some bacteria which live without air, yeasts must have air in order to grow. They need sugar, but have the ability to change starch into sugar. When yeasts act on sugar, the formation of alcohol and carbon dioxide results. In the baking industry, yeast is used to “raise dough” through the production of carbon dioxide. The alcohol is driven off by the heat of the oven. In wine production, the carbon dioxide gas bubbles off, leaving the alcohol. The amount of alcohol produced by yeasts is limited to 18%, because yeasts are killed at this concentra-

tion of alcohol.

Yeasts reproduce by budding, which is similar to binary fission. Generally, the methods described for destruction of bacteria will kill yeasts as well.

Yeasts are not generally considered to be pathogenic or harmful, although a few of them do cause skin infections. Wild yeasts, or those that get into a food by accident rather than by design of the food processor, cause food spoilage and decomposition of starch and sugar, and therefore are undesirable.

### Molds

Molds are multicellular (many-celled) microscopic plants which become visible to the naked eye when growing in sufficient quantity. Mold colonies have definite colors (white, black, green, etc.). They are larger than bacteria or yeasts. Some molds are pathogenic, causing such diseases as athletes' foot, ringworm, and other skin diseases. However, moldy foods usually do not cause illness. In fact, molds are encouraged to grow in certain cheeses to produce a characteristic flavor.

The structure of the mold consists of a root-like structure called the *mycelium*, a stem (aerial filament) called the hypha, and the spore sac, called the sporangium. All molds reproduce by means of spores. Molds are the lowest form of life that have these specialized reproductive cells.

Molds require moisture and air for growth and can grow on almost any organic matter, which does not necessarily have to be food. Molds do not require warmth, and grow



very well in refrigerators. Neither do molds require much moisture, although the more moisture present, the better they multiply.

Methods of destruction for molds are similar to those required for bacteria. Heat, chemicals, and ultraviolet rays destroy mold spores as well

as the molds. *Refrigeration does not necessarily retard their growth.*

Certain chemicals act as mold inhibitors. Calcium propionate (Mycoban) is one used in making bread. This chemical when used in the dough, retards the germination of mold spores, and bread so treated will remain mold-free for about five days.

One of the most beneficial molds is the Penicillium mold from which penicillin, an antibiotic, is extracted. The discovery, by Dr. Alexander Fleming, of the mold's antibiotic properties opened up a whole field of research, and other antibiotic products from molds have been discovered.

## QUICK REVIEW

1. Foods that have been contaminated with pathogenic bacteria (☐ will ☐ will not) change in taste and smell.
2. Under favorable conditions bacteria can double their population every 20 to 30 minutes. ☐ TRUE ☐ FALSE
3. At what temperature is rapid growth of pathogenic bacteria possible? ☐ 65°F ☐ 140°F
4. What are the six factors that affect the growth of bacteria? \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_.
5. Which of the following foods may encourage rapid growth of bacteria?: Cooked rice/Hard boiled air cooled shell egg
6. What type of bacteria grows best at temperatures between 50°-110°F? \_\_\_\_\_
7. What is the water activity level at which bacteria have difficulty reproducing? \_\_\_\_\_
8. In the life cycle of bacteria, during which phase do bacteria grow most quickly? \_\_\_\_\_
9. Most viral food-borne diseases are the result of poor personal hygiene. ☐ TRUE ☐ FALSE
10. The food-borne parasite typically found in under-cooked pork is: \_\_\_\_\_
11. A food-borne parasite typically found in marine fish is: \_\_\_\_\_
12. The most popular chemical sanitizer is \_\_\_\_\_
13. Food held under refrigeration must be at or below: \_\_\_\_\_°F
14. The reason for refrigerating potentially hazardous foods is to: \_\_\_\_\_

## FOODBORNE ILLNESSES

There are three categories of foodborne illnesses: infection, intoxication and toxin mediated infection.

### Foodborne Infection

This is an illness that is caused by eating a food that has large numbers of microorganisms on it. These microorganisms enter the human digestive tract and disrupt the functions of the intestines resulting in diarrhea and other problems. The severity of the problem depends on the dosage ingested and the particular bacterium.

The first symptoms of an infection will occur from as early as six hours to

as long as forty eight hours after the contaminated food is eaten.

### Foodborne Intoxication

This is an illness that is caused by eating a food that has the toxins that are generated by certain microorganisms. The longer a micro-organism is on a food, the more time it has to multiply and produce its waste products. These waste products are toxins and result in an intoxication when that food is eaten.

It is important to note that an intoxication will cause nausea and vomiting, either immediately after the food is eaten or within the first

six hours. Also, toxins are not destroyed by heat so once they are formed no amount of cooking afterwards will inactivate them.

### Foodborne Toxin Mediated Infection

This illness occurs when one ingests a food that has microorganisms on it. These micro-organisms find favorable conditions to grow in the intestines and produce their toxins which will then cause a foodborne illness.

## COMMON FOODBORNE ILLNESSES

**ILLNESS:** **Salmonellosis**  
**BACTERIA:** *Salmonella enteritidis*  
**SOURCE:** Animals, poultry, eggs, and humans  
**FOODS INVOLVED:** Chicken, other poultry, eggs  
**ONSET TIME:** 6–48 hours  
**TYPE OF ILLNESS:** Infection  
**SYMPTOMS:** Abdominal pain, diarrhea, chills, fever, nausea, vomiting, and malaise

### CONTROL MEASURES

- Cook chicken, poultry and stuffing to 165°F for at least 15 seconds.
- Refrigerate raw chicken, poultry, and other meats to 41°F or lower.
- Pay close attention to eggs: store eggs in a refrigerator at 45°F or lower. Cook eggs to 145°F or higher, (or per customer request), break and cook eggs to order, and use pasteurized eggs instead of raw eggs if a food is not going to be cooked to at least 145°F.
- Prevent cross contamination.

**ILLNESS:** **Staphylococcal gastroenteritis**  
**BACTERIA:** *Staphylococcus aureus*  
**SOURCE:** Healthy human beings: in nose, throat, hair, on infected cuts, bruises, abscesses and acne.  
**FOODS INVOLVED:** Baked goods, custards, pastry, and cooked foods traditionally left out at room temperature: ham, sliced meats and other foods with low water activity  
**ONSET TIME:** 6–48 hours  
**TYPE OF ILLNESS:** Infection  
**SYMPTOMS:** Abdominal pain, diarrhea, chills, fever, nausea, vomiting, and malaise

### CONTROL MEASURES

- Prevent bare hand contact with ready-to-eat foods.
- Practice good personal hygiene.
- Prevent infected food workers from working. Look out for any worker that has an infected cut or wound on the hands or skin.
- Keep all foods at 41°F or below; cool foods rapidly.

**ILLNESS:** **Campylobacteriosis**  
**BACTERIA:** *Campylobacter jejuni*  
**SOURCE:** Poultry, pigs, sheep and cattle  
**FOODS INVOLVED:** Chicken, other poultry, beef, liver and water

**ONSET TIME:** 2–10 days  
**TYPE OF ILLNESS:** Infection  
**SYMPTOMS:** Diarrhea (often-times bloody), severe abdominal pain, fever, anorexia, malaise, headache and vomiting.

### CONTROL MEASURES

- Proper sanitization of equipment in order to prevent cross contamination.
- Thoroughly cook meat, poultry and poultry products.
- Use only pasteurized milk.
- Use potable water.

**ILLNESS:** **Listeriosis**  
**BACTERIA:** *Listeria monocytogenes*  
**SOURCE:** Soil, infected animals or humans, and water  
**FOODS INVOLVED:** Unpasteurized milk, raw vegetables, poultry, raw meats, cheese  
**ONSET TIME:** 1 day–3 weeks  
**TYPE OF ILLNESS:** Infection  
**SYMPTOMS:** Low grade fever, flu-like symptoms, stillbirths, meningitis and encephalitis. \* Fatalities may occur

### CONTROL MEASURES

- Cook foods thoroughly and to required minimum temperatures.
- Use only pasteurized milk and dairy products.
- Thoroughly wash raw vegetables before eating.
- Avoid cross contamination.
- Clean and sanitize all surfaces.

**ILLNESS:** **Shigellosis**  
**BACTERIA:** *Shigella species*  
**SOURCE:** Human  
**FOODS INVOLVED:** Raw produce, moist prepared foods—tuna, macaroni, potato salads, etc.  
**ONSET TIME:** 1–7 days  
**TYPE OF ILLNESS:** Infection  
**SYMPTOMS:** Abdominal pain, diarrhea bloody stools and fever.

### CONTROL MEASURES

- Practice good personal hygiene with special emphasis on hand washing, especially after using the toilet.
- Avoid bare hands contact with ready-to-eat foods.
- Rapidly cool foods to 41°F or below.
- Avoid cross contamination.
- Eliminate flies from the facility.
- Clean and sanitize all surfaces.

**ILLNESS:** **Botulism**  
**BACTERIA:** *Clostridium botulinum*  
**SOURCE:** Soil, water, intestinal tract of animals and fish  
**FOODS INVOLVED:** Home-canned foods, smoked and vacuum packaged fish, garlic in oil, baked potatoes, and thick stews  
**ONSET TIME:** 12–36 hours  
**TYPE OF ILLNESS:** Intoxication  
**SYMPTOMS:** Gastrointestinal symptoms may precede neurological symptoms: vertigo, blurred or double vision, dryness of mouth, difficulty swallowing, speaking and breathing, muscular weakness and respiratory paralysis. This illness may cause fatalities.

#### CONTROL MEASURES

- Never use home-canned or home-jarred products.
- Store smoked fish at 38°F or below. Store all vacuum packaged foods according to manufacturer's recommended instructions (time and temperatures).
- Keep commercially prepared garlic and other herbs in oil refrigerated at all times.
- Avoid cross contamination.

**ILLNESS:** **Scombroid poisoning**  
**BACTERIA:** Bacteria that help produce histamine  
**SOURCE::** Tuna, bluefish, mackerel, bonito, and mahi mahi  
**FOODS INVOLVED:** Cooked or raw tuna, bluefish, mackerel, bonito, and mahi mahi  
**ONSET TIME:** Minutes–2 hours  
**TYPE OF ILLNESS:** Intoxication  
**SYMPTOMS:** Headache, dizziness, nausea, vomiting, peppery taste, burning sensation in the throat, facial swelling and stomach aches.

#### CONTROL MEASURES

- Use a reputable supplier.
- Refuse fish that have been thawed and re-frozen. Signs that fish have been re-frozen include dried or dehydrated appearance; excessive frost or ice crystals in the package; or white blotches (freezer burns).
- Check temperatures. Fresh fish must be between 32°F and 41°F.
- Thaw frozen fish at refrigeration temperature of 41°F or below.

**ILLNESS:** **Hemorrhagic colitis**  
**BACTERIA:** *Shiga toxin* producing *escherichia coli* such as e.coli 0157:h7  
**SOURCE:** Cattle, humans, unpasteurized milk, untreated water  
**FOODS INVOLVED:** Raw and undercooked ground meats, fresh produce, unpasteurized milk and untreated water  
**ONSET TIME:** 12–72 hours  
**TYPE OF ILLNESS:** Intoxication as well as infection  
**SYMPTOMS:** Diarrhea (often bloody), severe abdominal pain nausea, vomiting, chills. In children it may complicate into hemolytic uremic syndrome (hus), responsible for kidney failure and blood poisoning.

#### CONTROL MEASURES

- Cook ground beef and all ground meats to 158°F or higher.
- Cook all foods to required minimum cooking temperatures.
- Use pasteurized milk.
- Reheat all foods to 165°F within 2 hours.
- Avoid cross contamination.
- Practice good personal hygiene. Wash hands thoroughly after touching raw foods or after any activity that may have contaminated them.

**ILLNESS:** **Clostridium perfringens enteritis**  
**BACTERIA:** *Clostridium perfringens*  
**SOURCE:** Soil, water, gastrointestinal tract of healthy humans and animals (cattle, poultry, pigs, and fish)  
**FOODS INVOLVED:** Meat, stews, chilli, gravies, poultry, beans  
**ONSET TIME:** 8–22 hours  
**TYPE OF ILLNESS:** Intoxication as well as infection  
**SYMPTOMS:** Diarrhea and abdominal pain

#### CONTROL MEASURES

- Rapidly cool meat dishes. (cooling methods are discussed in detail on pages 28-29).
- Rapidly reheat foods to 165°F within 2 hours.
- Avoid preparing foods days in advance.
- Do not reheat foods on the steam table or any other hot holding equipment.
- Hold hot foods at 140°F or above.

**ILLNESS:** ***Bacillus cereus* gastroenteritis**  
**BACTERIA:** *Bacillus cereus*  
**SOURCE:** Soil and dust, cereal crops  
**FOODS INVOLVED:** Rice, starchy foods—pasta, potatoes, dry food products, meats, and milk.  
**ONSET TIME:** 30 minutes–5 hours  
**TYPE OF ILLNESS:** Intoxication as well as infection  
**SYMPTOMS:** Nausea, abdominal pain and watery diarrhea

## CONTROL MEASURES

- Do not keep foods at room temperature.
- Rapidly cool meat dishes.
- Rapidly reheat foods to 165°F within 2 hours.
- Serve cooked foods quickly after preparation.

**ILLNESS:** ***Vibrio parahaemolyticus* gastroenteritis**  
**BACTERIA:** *Vibrio parahaemolyticus*  
**SOURCE:** Clams, oysters, scallops, shrimp, crabs  
**FOODS INVOLVED:** Raw or partially cooked shellfish  
**ONSET TIME:** 30 minutes–5 hours  
**TYPE OF ILLNESS:** Intoxication as well as infection  
**SYMPTOMS:** Nausea, abdominal pain and watery diarrhea

## CONTROL MEASURES

- Avoid eating raw or undercooked shellfish.
- Purchase seafood from approved sources.
- Keep all seafood refrigerated at 41°F or lower.
- Avoid cross contamination.

**ILLNESS:** **Hepatitis A**  
**VIRUS:** *Hepatitis A virus*  
**SOURCE:** Human feces, fecal contaminated waters, fecal contaminated produce  
**FOODS INVOLVED:** Raw or partially cooked shellfish, fruits and vegetables, salads, cold cuts, water and ice.  
**ONSET TIME:** 15–50 days  
**SYMPTOMS:** Fever, malaise, lassitude, nausea, abdominal pain and jaundice

## CONTROL MEASURES

- Obtain shellfish from approved sources.
- Ensure that food workers practice good personal hygiene.
- Avoid cross contamination.
- Clean and sanitize food contact surfaces.
- Use potable water.

**ILLNESS:** **Norovirus gastroenteritis**  
**VIRUS:** *Norovirus* (aka norwalk-like virus)  
**SOURCE:** Human feces, fecal contaminated waters, fecal contaminated produce  
**FOODS INVOLVED:** Ready-to-eat foods such as salads, sandwiches, baked products, oysters, fruits and vegetables.  
**ONSET TIME:** 12–48 hours  
**SYMPTOMS:** Fever, vomiting, watery diarrhea, abdominal pains

## CONTROL MEASURES

- Prevent ill food workers from working until fully recovered.
- Ensure that food workers practice good personal hygiene.
- Obtain shellfish from approved sources.
- Avoid cross contamination.
- Clean and sanitize food contact surfaces.
- Use potable water.

**ILLNESS:** **Rotavirus gastroenteritis**  
**VIRUS:** *Rotavirus*  
**SOURCE:** Human feces, fecal contaminated waters, fecal contaminated food  
**FOODS INVOLVED:** Ready-to-eat foods such as salads, sandwiches, baked products, contaminated water  
**ONSET TIME:** 1–3 days  
**SYMPTOMS:** Vomiting, watery diarrhea, abdominal pains and mild fever

## CONTROL MEASURES

- Prevent ill food workers from working until fully recovered.
- Ensure that food workers practice good personal hygiene.
- Avoid cross contamination.
- Clean and sanitize food contact surfaces.
- Use potable water.

**ILLNESS:** **Astrovirus gastroenteritis**  
**VIRUS:** *Astrovirus*  
**SOURCE:** Human feces, fecal contaminated food  
**FOODS INVOLVED:** Ready-to-eat foods such as salads, sandwiches, baked products, contaminated water.  
**ONSET TIME:** 10–70 hours

**SYMPTOMS:** Vomiting, watery diarrhea, abdominal pains and mild fever.  
*Outbreaks are more likely to occur in daycare and eldercare facilities.*

## CONTROL MEASURES

- Prevent ill food workers from working until fully recovered.
- Ensure that food workers practice good personal hygiene.
- Avoid cross contamination.
- Clean and sanitize food contact surfaces.
- Use potable water.

**ILLNESS:** **Trichinosis**  
**PARASITE:** *Trichinella spiralis*  
**SOURCE:** Pigs, wild game such as bear and walrus  
**FOODS INVOLVED:** Raw and undercooked pork, pork products, bear, walrus and any other food products contaminated with the former.  
**ONSET TIME:** 4–28 days  
**SYMPTOMS:** Gastroenteritis, fever, facial edema, muscular pains, prostration, and labored breathing.

## CONTROL MEASURES

- Cook pork and pork products to 155°F or higher for at least 15 seconds.
- Wash, rinse and sanitize equipment used to process pork and pork products before use.
- Purchase all pork and pork products from approved suppliers.

**ILLNESS:** **Anisakiasis**  
**PARASITE:** *Anisakis simplex*  
**SOURCE:** Marine fish (saltwater species)  
**FOODS INVOLVED:** Raw, undercooked, or improperly frozen fish like Pacific salmon, mackerel, halibut, monkfish, herring, flounder, fluke, cod, haddock, and other fish used for sushi, sashimi, and ceviche.  
**ONSET TIME:** Within hours  
**SYMPTOMS:** Mild cases include tingling or tickling sensation in throat, vomiting, or coughing up worms. Severe cases include debilitating stomach pains, vomiting, and diarrhea.

## CONTROL MEASURES

- Obtain seafood from approved sources.
- Thoroughly cook all seafood to 145°F or higher.
- Only use sushi-grade fish for sushi and sashimi.
- Any fish to be consumed raw should be frozen at minus 31°F for 15 hours.

**ILLNESS:** **Cyclosporiasis**  
**PARASITE:** *Cyclospora cayentanensis*  
**SOURCE:** Human feces; fecal contaminated water  
**FOODS INVOLVED:** Raw produce, raw milk, water.  
**ONSET TIME:** About a week  
**SYMPTOMS:** Watery diarrhea, mild fever, nausea, abdominal pains.

## CONTROL MEASURES

- Ensure food workers practice good personal hygiene.
- Wash all produce- fruits and vegetables, especially berries, thoroughly.
- Use potable water.

## QUICK REVIEW

1. Salmonella enteritidis is mainly associated with: \_\_\_\_\_
2. Food workers sick with an illness that can be transmitted by contact with food or through food should be: \_\_\_\_\_
3. We can control the growth of the microorganism *Clostridium perfringens* by \_\_\_\_\_.
4. Ground meats such as hamburgers must be cooked to a minimum temperature of 158°F to eliminate: \_\_\_\_\_
5. *Clostridium botulinum* causes the disease known as botulism. ☐ TRUE ☐ FALSE
6. The microorganism *Clostridium botulinum* is mainly associated with the following: Smoked fish/tuna fish
7. The following illness has been associated with under-cooked shell eggs: \_\_\_\_\_
8. Staphylococcal food intoxication is a common cause of food-borne illness that can be prevented by cooking foods thoroughly.  
☐ TRUE ☐ FALSE
9. Shigellosis can be eliminated by cooking pork to 155°F for 15 seconds. ☐ TRUE ☐ FALSE
10. Scombroid poisoning occurs when someone eats decomposing: \_\_\_\_\_
11. Viral Hepatitis is caused by *Bacillus cereus*. ☐ TRUE ☐ FALSE
12. *Escherichia coli* O157:H7 is responsible for causing Hemolytic Uremic Syndrome (HUS) among children. ☐ TRUE ☐ FALSE
13. *Escherichia coli* O157:H7 is mainly associated with ground poultry. ☐ TRUE ☐ FALSE
14. The illness **trichinosis** is caused by a parasite known as *Trichinella spiralis*. ☐ TRUE ☐ FALSE
15. To avoid **trichinosis**, NYC Health Code requires pork to be cooked to a minimum temperature of: \_\_\_\_\_
16. Shellfish tags must be kept with the product until it's used up and then filed away for: \_\_\_\_\_
17. Raw, marinated or partially cooked fish is made safe by freezing at \_\_\_\_\_°F for \_\_\_\_\_



## PERSONAL HYGIENE

Personal hygiene simply means keeping yourself, and your clothes as clean as possible. Proper personal hygiene is extremely important in preventing food borne illness since people are the main source of food contamination. Food workers should always practice the highest standards of personal hygiene to ensure that food is safe from biological, chemical, and physical hazards. Personal hygiene enhances the good public image that is so essential to a good food business. Highest standards of personal hygiene include proper hand washing, short and clean fingernails, notifying supervisor when ill, use of proper hair restraints, proper use of disposable gloves, refraining from wearing jewelry, avoid eating, drinking, smoking or otherwise engaging in any activity that may contaminate the foods.

Personal hygiene is a combination of several components described below:

### Proper Work Attire

Employees who prepare or serve food products, or wash and sanitize equipment and utensils must wear clean outer garments. It is recommended that aprons, chef jackets, or smocks are worn over street clothing. Whenever food workers leave the food area, they should remove their apron and store it properly. For example, when using the bathroom, on breaks, taking out trash, or delivering food.

Keep personal clothing and other personal items away from food handling and storage areas. Employers must provide adequate storage areas for employees' personal belongings.

### Hair Restraints

Food workers are required to wear hair restraints such as hair nets, caps, hats, scarves, or other form of hair

restraints that are effective (facial hair included). This is necessary to prevent them from touching their hair as well as to prevent hair from falling into the food.

### Wearing of Jewelry

Wearing jewelry such as necklaces, bracelets, earrings, and other jewelry while working poses a physical hazard and as such should not be worn by food workers when preparing or serving food (*a wedding band is an exception to this rule.*)

### Importance of Clean Hands

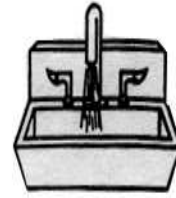
Clean hands are extremely important for the safety of food. Most people do not realize that as part of the normal flora, we carry a lot of different disease causing microorganisms on our hands. For instance, it is estimated that roughly 50–75 % of all healthy humans carry the *Staphylococcus* bacteria (mainly in the nasal passage which can easily be transferred to hands by simply touching or blowing the nose). About 60–70% of the healthy humans carry *Clostridium perfringens*, which can also be easily transmitted onto foods with hands.

In addition to the normal flora, there are also transient microorganisms found on our hands that we pick up through incidental contact by touching various objects. For instance, traveling to work from home, we may end up touching various contaminated surfaces, e.g., door handles, turnstiles, etc. This is the reason why hands must be washed often and thoroughly.

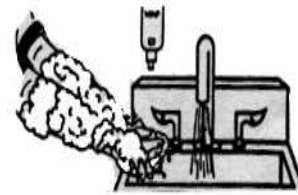
### Hand washing

Washing hands properly is the most effective way of removing microorganisms. Proper hand washing involves the use of both hot and cold running water, soap, and paper towels or a hot air dryer.

### The Steps of Proper Hand Washing



Use hot and cold running water



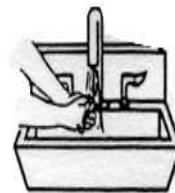
Wet hands and apply soap, lather generously up to the elbow



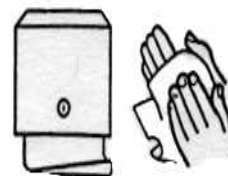
Use a brush on the nails.



Rub hands together for 20 seconds



Rinse hands thoroughly



Dry hands on disposable paper towels or a hot air dryer

Always ensure that hands are washed and dried thoroughly before starting work, between tasks, and before working with food products, equipment, utensils, and linen. Correct hand washing includes cleaning the backs of hands, palms, forearms, between fingers and under the fingernails using hot water, soap, and a fingernail brush.

Hand-washing sinks must be located within 25 feet of each food preparation, food service and ware-washing area, and in or adjacent to employee and patron bathrooms. Doors, equipment and other material cannot block hand-washing sinks.

## Bare hand contact

The New York City Health Code prohibits the handling of ready-to-eat foods with bare hands. Although proper hand washing reduces a significant number of microorganisms from hands, but never removes all of them. In addition to that, many people can also be carriers of disease causing microorganisms without

getting sick themselves. These individuals may not show the symptoms (asymptomatic) or they may have recovered from an illness, but they can easily pass these germs to others through contact with food or food areas. This is why it is important to prevent bare hand contact with **ready-to-eat foods** by means of sanitary gloves or other utensils such as tongs, spatula, deli paper (tissue), or other utensils.

## Exclusion of sick Employees

Any food employee who is sick with an illness that is transmissible through contact with food must be excluded from working in the food establishment until fully recovered. Some of these illnesses include:

- Amebiasis
- Cholera
- Cryptosporidiosis
- Diphtheria
- E. Coli 0157:H7
- Giardiasis
- Hepatitis A
- Poliomyelitis
- Salmonellosis

- Shigellosis
- Streptococcal sore throat (including scarlet fever)
- Superficial staphylococcal infection
- Tuberculosis
- Typhoid
- Yersiniosis
- Infected cut or boil
- Any other communicable disease

It is the employee's responsibility to inform the supervisor in case of an illness, however; supervisors should be vigilant and observe any signs that may indicate that the employee may be sick. Train employees properly on the hazards of working while ill with a disease transmissible through contact with or through food.

## Cuts, Wounds, and Sores

All cuts and wounds that are not infected on the hands and arms must be completely covered by a waterproof bandage. Wear single-use gloves or finger cots over any bandages on the hands and fingers.

## The Don't Habits

- 1) Don't smoke or use tobacco in any form while in the food preparation area.
- 2) Don't work when you have a fever, cough, cold, upset stomach or diarrhea.
- 3) Don't store personal medication among food.
- 4) Don't work if you have an infected, pus-filled wound.
- 5) Don't use a hand sanitizer as a substitute for hand washing. A hand sanitizer may be used in addition to proper hand washing.
- 6) Don't spit about while preparing food.

## Personal Hygiene Checklist

At the beginning of each work day ask yourself the following questions:

- ✓ Did I shower or take a bath before coming to work?
- ✓ Am I sick with a fever, cold or diarrhea?
- ✓ Do I have any infected cuts or burns?
- ✓ Are my nails clean, trimmed and free from nail polish?
- ✓ Are my apron and clothing clean?
- ✓ Did I remove my jewelry?
- ✓ Am I wearing my hat, cap or hairnet?

## QUICK REVIEW

1. As Per New York City Health Code, hands must be washed thoroughly at least 3 times every day. ☐ TRUE ☐ FALSE
2. Sick food workers who can transmit their illness thorough contact with food should be prevented from working until they are well. ☐ TRUE ☐ FALSE
3. Hands must be washed thoroughly after: \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_.
4. The NYC Health Code requires hand wash sinks to be readily accessible at all \_\_\_\_\_ and \_\_\_\_\_.
5. The hand wash sinks must be provided with: \_\_\_\_\_ and \_\_\_\_\_ running water, \_\_\_\_\_ and \_\_\_\_\_.
6. The NYC Health Code requires that all food workers wear proper hair restraint. ☐ TRUE ☐ FALSE
7. A food worker with an infected cut on his/her hand: \_\_\_\_\_
8. During hand washing hands must be rubbed together for at least: \_\_\_\_\_
9. Clean aprons can be used for wiping hands. ☐ TRUE ☐ FALSE
10. Hand sanitizer can be used in place of hand washing during busy periods. ☐ TRUE ☐ FALSE

## FOOD PREPARATION

This is another step during which care is needed to maintain food safety. Preparation refers to the actions that are necessary before a food item can be cooked, or in the case of a food that is served raw, actions that are necessary before it can be served.

### Thawing

Thawing is also referred to as defrosting. The Health Code requires that whole frozen poultry must be thawed before being cooked, however, a single portion may be cooked from a frozen state.

Other potentially hazardous products should be treated in the same way: individual portions may be cooked from a frozen state, while all others should be thawed before cooking. It is important to use methods that will allow the entire mass to thaw evenly. Any method that only allows the outside surface to thaw while the inner portion remains frozen is unacceptable, since the outside surface will be in the danger zone for a prolonged period of time.

The New York City Health Code allows the following acceptable thawing methods:

1) Frozen foods can be removed from the freezer and stored in a refrigerator a day or two before they

are needed. In this way the frozen item will defrost but will not go above 41°F.

2) Frozen foods may be submerged under water with the cold water faucet open and the water running continuously so that any loose particles may float and run off.

3) Frozen foods may be thawed in a microwave oven but this may only be done if:

- ◆ After thawing, the food item is removed immediately for cooking in the regular oven or stove.
- ◆ The entire cooking process takes place without interruption in the microwave oven.

### Cutting, Chopping, Mixing, Mincing, Breading

Any necessary process that will place a food item within the tem-

perature danger zone must be controlled. Preparing or processing the item in batches will minimize the amount of time that item is out of refrigerated storage and the opportunity for microorganisms to grow.

After preparation, if the food is not cooked immediately, it must again be refrigerated until it is ready for cooking. Care must be taken to ensure that potentially hazardous foods are never left out in the temperature danger zone except for very short periods during preparation.

### Cross contamination

This is a term typically used for any situation where harmful microorganisms transfer from a raw or contaminated food to a cooked or ready-to-eat food. All raw products, particularly meat, fish and eggs, have harmful microorganisms. Therefore, it is important to keep them separate from cooked or ready-to-eat foods. Cross-contamination can happen in many ways, the following are but a few:

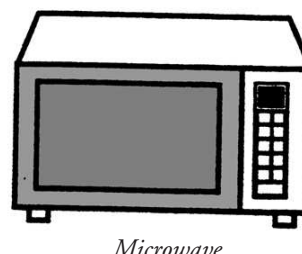
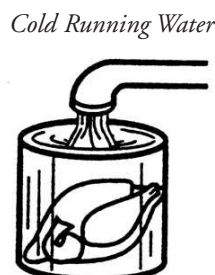
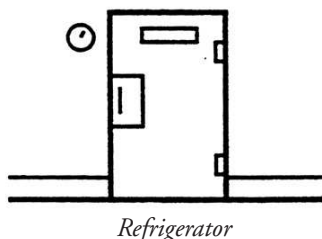
### NEW

#### DEDICATED FOOD-WASHING SINKS

Cross-contamination happens when bacteria from one food spread to another. This is a common cause of foodborne illnesses. One way to prevent this is to keep cooked and ready-to-eat foods away from potentially hazardous raw foods, such as meat, poultry and fish. To reduce the risk of cross-contamination, the Health Code now requires washing food in:

1. A single-compartment culinary sink used for this purpose only.
2. A dedicated compartment of a multi compartment sink.
3. A food-grade container or colander (if neither of the above is available).
4. Food-washing sinks must be cleaned and sanitized prior to use and after the washing of raw meat.
5. A sink in which food is washed may not be used as a slop or utility sink or for hand-washing.

### Thawing Methods



- ♦ Preparing raw chicken for cooking and then preparing a fresh salad without washing hands thoroughly.
- ♦ Preparing raw chicken and then cutting the cooked chicken on the same cutting board.
- ♦ Storing a raw product above a cooked product in such a manner that the juices of the product above fall on the product below.

In all three examples, as in most cases in which cross contamination is the cause of a foodborne illness, human errors play a major role. Therefore, food workers have to be vigilant to prevent these situations from occurring.

#### **Bare hand contact**

Ready-to-eat foods served by infected food workers have proven to be a serious public health problem and as such, regulations were put in place to prohibit bare hand contact with foods that will not be later cooked or reheated before serving.

#### ***What kind of foods may not be prepared with bare hands?***

Ready-to-eat foods such as salads and sandwiches; foods that will not later be cooked to a temperature

required by the Health Code; and food that is not later reheated to 165°F before serving.

#### ***What are acceptable practices to prepare ready-to-eat foods?***

The use of utensils, tongs, deli paper or sanitary gloves are acceptable for preparing ready-to-eat foods.

#### ***May ready-to-eat foods be touched with bare hands if the hands are washed, or a germicidal soap or hand sanitizer is used?***

No. Although hand washing is effective in reducing contamination, not all of the contamination can be removed from the hands. Germicidal soaps and hand sanitizer are not effective in food industry because of the high levels of fat molecules on worker's hands. These molecules allow microbes to survive.

#### ***What happens if gloves, deli paper or other utensils are not available to prepare ready-to-eat foods?***

If appropriate utensils are not available, ready-to-eat foods may not be prepared until bare hand contact with food can be prevented. If bare hand contact with ready-to-eat foods is observed by health department inspectors, a violation will be recorded on the inspection report and enforcement action will

be taken. Any ready-to-eat food that has been prepared with bare hands is considered to be contaminated and should be discarded.

#### ***How often should disposable gloves be changed?***

Disposable gloves must be changed when they become contaminated, torn or when the food service worker leaves the food preparation area. They should also be changed frequently to minimize build-up of perspiration and bacteria inside the gloves.

#### ***May I use the same pair of disposable gloves to prepare raw meat or poultry and then prepare ready-to-eat food?***

No. This is an example of cross-contamination. Disposable gloves worn during preparation of raw foods, such as uncooked meat and poultry, must not be used to prepare ready-to-eat food.

#### ***How can ready-to-eat foods be prepared during grilling and slicing operations?***

A glove can be worn on the hand that is used to prepare ready-to-eat ingredients, leaving the other hand uncovered for placing raw ingredients on the grill. Wear tight fitting gloves when operating a slicing machine or chopping or cutting food. It is safer to use tight fitting gloves.

### **COOKING, HOT HOLDING, COOLING, REHEATING**

**C**ooking is a critical step in the food preparation process. It is at this stage that we have the opportunity to destroy microorganisms or germs that are on raw foods. Cooking food to an internal temperature that will destroy the microorganisms normally found on it will ensure the safety of that food. The required internal temperature must be reached without any interruption of the cooking process. It is

important to use a sanitized, properly calibrated thermometer to verify that the required minimum cooking temperature is reached.

#### **Rare Roast Beef**

Rare roast beef and/or rare beef steaks are to be cooked to the following minimum temperatures and times, unless otherwise requested by the customer.

<b>Temperature</b>	<b>Time</b>
<b>130 ° F</b>	<b>121 minutes</b>
<b>132 ° F</b>	<b>77 minutes</b>
<b>134 ° F</b>	<b>47 minutes</b>
<b>136 ° F</b>	<b>32 minutes</b>
<b>138 ° F</b>	<b>19 minutes</b>
<b>140 ° F</b>	<b>12 minutes</b>
<b>142 ° F</b>	<b>8 minutes</b>
<b>144 ° F</b>	<b>5 minutes</b>
<b>145 ° F</b>	<b>3 minutes</b>

## Cooking Temperatures for Various Foods

Product	Minimum Internal Cooking Temperature	Notes
<b>Poultry, stuffed meats, and stuffing containing meats</b>	<b>165 °F</b> (for 15 seconds)	Take special precautions with poultry, since there are more types and higher counts of microorganisms present. Always cook stuffing separately from the poultry, because stuffing acts as insulation.
<b>Ground meats, and foods containing ground meats</b>	<b>158 °F</b> (for 15 seconds)	Most meats are likely to be contaminated with harmful microorganisms on the surface. When meat is ground, the surface microorganisms are mixed throughout the product.
<b>Pork and foods containing pork</b>	<b>155 °F</b> (for 15 seconds)	This is the temperature needed to destroy the <i>trichinella spp.</i> , as well as other microorganisms such as <i>toxoplasma gondii</i> .
<b>Shell eggs and foods containing shell eggs</b>	<b>145 °F</b> (for 15 seconds)	<i>Exception:</i> Eggs may be prepared at a lower temperature when requested by customer. Pooling of eggs is not permitted. Only use pasteurized eggs for recipes that call for no cooking or limited cooking. (e.g. Caesar Salad dressing, eggnog, hollandaise sauce, etc.)
<b>All other meats and fish</b>	<b>145 °F</b> (for 15 seconds)	This includes lobsters, shrimps, clams, oysters, mussels, lamb, goat, etc.

### NEW

#### OUTDOOR COOKING REQUIREMENTS

Cooking outdoors is now allowed provided the establishment protects food and equipment. To cook outdoors, the establishment must:

1. Have permission to cook outdoors from the Buildings and Fire Departments and any other agency as required by law.
2. Maintain complete control of the outdoor cooking space.
3. Provide a hand wash sink if food is prepared outdoors.
4. Protect food, utensils and cooking equipment from contamination using awnings, tents, screens or vermin-resistant containers.
5. Store food, utensils and equipment indoors when the outdoor area is not in operation.
6. Prevent nuisances, such as from smoke, garbage, noise or pests.
7. Construct the floor using smooth, durable, non-absorbent and easily cleanable material that is free of gaps.
8. Have sufficient lighting to allow safe operations and cleaning.

The Health Code requires 540 Lux (50 foot candles) of lighting at surfaces where food workers are preparing and processing food or using utensils or equipment such as knives, slicers, grinders or saws.

Note: Cooking is not allowed on a street or sidewalk, except during street fairs or other events where City permission has been granted.



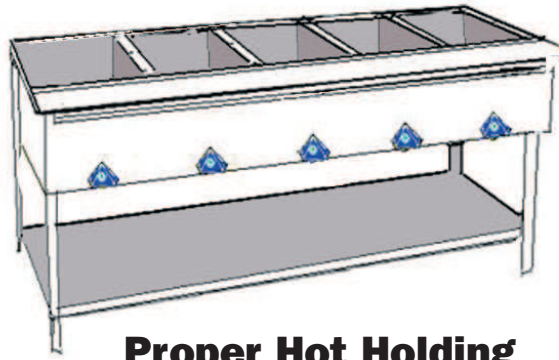
**ALWAYS**



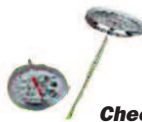
**Foods must be hot at 140° or higher before they are placed in the Hot Holding Unit**



**The Hot Holding Unit must be preheated before foods are placed in it.**



**Proper Hot Holding**



**Check food temps frequently.**

**NEVER**



**Never place cold foods in the Hot Holding Unit**



**Never double stack food containers in the steam table.**

**Cooking in a Microwave Oven**

Microwave cooking allows for a faster cooking process, however the cooking is uneven and can lead to "cold spots" where bacteria can easily multiply to a dangerous level. It is important to follow the guidelines below to ensure proper cooking:

- ♦ Arrange food items evenly and cover the dish with a lid or plastic wrap; the moist heat will help destroy harmful bacteria and ensure uniform cooking.
- ♦ When cooking large cuts of meats, adjust the settings to medium power, and cook for longer periods of time to ensure proper cooking.
- ♦ Stir or rotate food halfway through the process to eliminate cold spots where harmful bacteria can survive, and for more even cooking.
- ♦ Foods may be partially cooked in the microwave oven and then transferred to conventional oven for completion, however this transfer must be done immediately.
- ♦ Let food stand for at least two minutes after microwaving to

allow even distribution of heat throughout the product.

- ♦ Use a food thermometer to verify that the proper temperature is reached. Due to uneven cooking process in the microwave ovens, add 25°F to the final cooking temperature to ensure thorough cooking.

**Hot Holding**

*Once food is cooked, if not served immediately, it must be held at the proper temperature.*

Potentially hazardous food (PHF) that have just finished the cooking process or that have just been reheated must either be served immediately or held hot for future service. These foods must be held constantly at 140°F or higher. Failure to hold such foods at the adequate temperature will result in the growth of bacteria. This common error results in many cases of food borne illness each year.

A hot holding unit must be used to hot hold potentially hazardous foods properly. This unit must hold foods at 140°F or higher. Care and constant monitoring are required to

ensure that foods do not fall below 140°F. These foods should never be stored at room temperature.

**Place only hot foods (140°F) in a hot holding unit, never cold or warm foods.** The unit must first be pre-heated. The water in the reservoir should be approximately 180°F before use. Hot holding units should not be used to re-heat cold foods unless they are designed for this purpose.

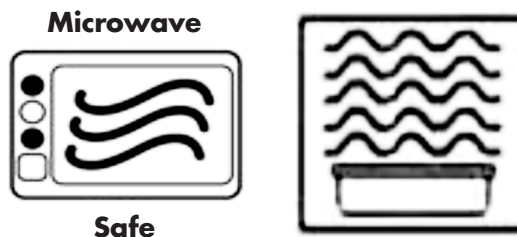
Constant monitoring of these foods is required to ensure that they remain at 140°F. Assign an employee to check food temperatures frequently and have these temperatures recorded.

An adequate number of properly functioning hot holding units are needed to store all potentially hazardous foods adequately. Foods placed in an overcrowded or overstocked steam table will not receive sufficient heat and will drop into the temperature danger zone. All foods must be placed directly in or near enough to the heat source to provide adequate heating. Food trays should not be stacked on top of each other (double-stacked) as this results in insufficient heating of the upper trays and possible contamination of the lower tray.

## NEW

### PLASTIC MICROWAVABLE CONTAINERS ALLOWED

Microwave-safe containers prevent harmful substances from leaching into foods. To protect diners, food establishments must use containers that display the words "microwave safe" or one of these symbols:



### Always:

- Place hot foods *ONLY* (140°F or higher) on a hot holding unit.
- Place foods on the steam table after the water has been heated to approximately 180°F.
- Check the temperature frequently and enter the results on the log sheet.
- Keep food covered as this will help retain heat and moisture and also protect the food from contamination.
- Store food in the tray wells of the unit. Food in double stacked or over-filled trays will not receive sufficient heat.
- Food in deep containers should be stirred occasionally to distribute heat evenly.

### Never:

- Never* mix freshly prepared food with foods that have been reheated.
- Never* reheat food in the hot holding unit, unless the unit is designed for such purpose.
- Never* place any food in a hot holding unit that has not been pre-heated.

### Cooling

Cooked potentially hazardous food items that are held for later

service must be cooled rapidly and stored in a refrigerator until ready for use. When foods are allowed to cool over a long a period of time, bacteria grow to sufficient numbers that may cause food-borne illnesses.

The NYC Health Code requires that all potentially hazardous foods prepared for later service be cooled down rapidly. This means that within the first two hours of cooling, the foods must be cooled from **140°F to 70°F** and then go from **70°F to 41°F** within an additional four hours or less. This rapid cooling requirement limits the length of time that potentially hazardous food spends in the temperature danger zone thus limiting the opportunity for growth of harmful bacteria.

Food in large, deep containers and large thick pieces of meat are difficult to cool down quickly. Great care must be taken during the cooling of soups, sauces, gravies, stews, rice, chili, whole turkey, turkey breast and whole roast beef. The temperature of cooling foods must be monitored and documented with a food product thermometer. Take the temperature of the cooling food each hour to ensure that it is cooling within the required time. Start these measurements at 140°F.

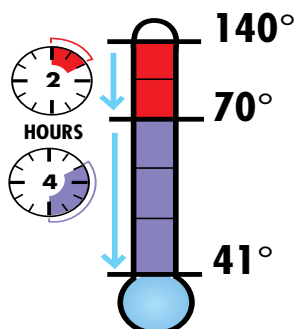
*Potentially hazardous foods that have been allowed to cool over an extended period of time- more than 2 hours when cooling from 140°F to 70°F, and more than 4 hours when cooling from 70°F to 41°F or below,*

*are considered contaminated and must be discarded.*

It is a fact that smaller portions of food cool down faster than larger portions. Hence, to encourage faster cooling, roasts and other large cuts of meat should be cut into portions no larger than 6 pounds. Thick foods like chili and refried beans should be poured out into shallow pans 4 inches deep. In both these cases, there is more surface area thus heat escapes faster. Cooling must take place in the refrigerator or in an ice bath. Never cool foods down by simply leaving them out at room temperature.

Foods do not cool at a constant rate. Hot food tends to cool relatively quickly while still very hot; the rate of cooling then slows greatly as the food temperature gets closer to the temperature of the refrigerator. The "cooling tracking sheet" is a good guide to show if foods are cooling properly. The food temperature must drop from 140°F to 90°F or lower by the end of first hour. If this doesn't happen, it clearly means that the rate of cooling is too slow and foods will never reach 70°F within 2 hours.

Many food workers underestimate the amount of time it takes for foods to cool down. Under typical restaurant kitchen refrigeration, a one-gallon container of cooked ground meat may take up to 15 hours to cool down. For this reason, it is essential to monitor food temperatures during the cooling process.

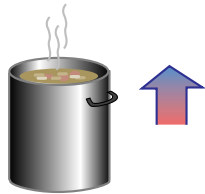


## Cooling Tracking Sheet

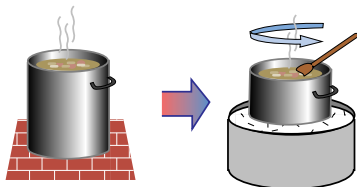
Hour	Temperature	
Start	140°	Recommended
1		90°
2		70°
3		
4		
5		
6		41°

### Established Methods to Assist Rapid Cooling:

- Always leave food *uncovered during cooling*; this will hasten the cooling process, replace the cover or lid only after the food has cooled down to 41°F.



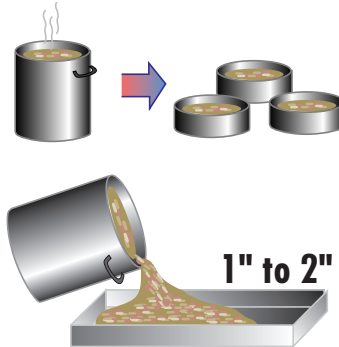
- Foods must be cooled in a refrigerator or in an ice bath. They should *never* be allowed to cool while stored at room temperature, for example, being left out on top of a counter.



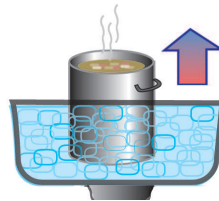
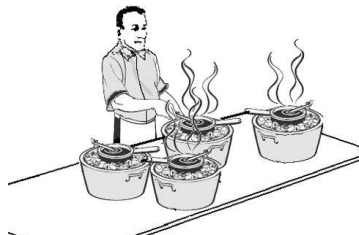
- Cut large pieces of meat into smaller pieces, *6 pounds or less*. Such small portions will cool rapidly. Larger pieces take longer to cool.



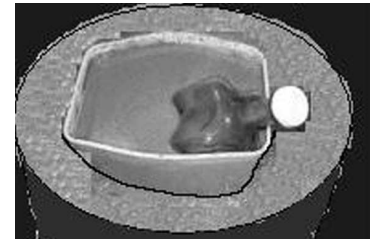
- Do not cool foods in large deep pots. Pour out the contents of large containers into much smaller ones or into *shallow pans 4 inches deep* with the product depth of 1 to 2 inches.



- Use an ice water bath. An ice water bath can be made up by filling a sink or other large container with ice and water. Place the container of hot food into the ice water bath. While foods are cooling in this ice bath, *stir the food* periodically. Do not forget to replace the ice as it melts away.



- You may *apply ice* directly into food as an ingredient. Thick soups and gravies may be cooled down rapidly by adding ice directly into the food.
- Use a Rapid Chill unit or a Blast chiller.
- Insert an ice paddle into food and stir.



- You may combine methods above, e.g., cut foods into small pieces and place in shallow pans in an ice-water bath.
- Metal containers such as stainless steel or aluminum are great conductors of heat. Use metal containers for all cooling operations.

### Reheating

The Health Code requires that potentially hazardous food that is cooked, cooled and reheated for hot holding must be reheated to 165°F or above for 15 seconds within two hours and held at 140°F or above until served. This procedure destroys the bacteria that cause food poisoning and prevents them from growing in the food.

Potentially hazardous foods reheated in a microwave oven must be covered and reheated to a temperature of at least 190°F and allowed to stand covered for two minutes afterwards. Microwave ovens cook unevenly and standing allows the temperature to be equally distributed throughout the food.

Ready-to-eat food taken from a commercially processed, hermetically sealed container or from an intact package from a food processing plant that is subject to City, State or Federal inspection, needs to be heated to 140°F within two hours from removal from container or package and held at that temperature until served.

Cooked and refrigerated food that is prepared for immediate

service to an individual customer may be served at any temperature that customer requests.

Foods should be prepared as close to the serving time as possible and in quantities that will minimize left-

overs, thus eliminating any need for cooling and reheating.

### Time as a Public Health Control

A Health Code change allows food establishments to hold potentially hazardous foods without temperature control if certain time limits and other guidelines are met. Using time only to monitor food, instead of time and temperature, is called Time as a Public Health Control. Using time as a public health control is a concept that recognizes that significant bacteria growth or toxin production are not possible within a limited time period. The Health Code allows food service establishments to use Time as a Public Health Control to hold hot or cold foods for a limited time without the use of heat or refrigeration. This cannot be done haphazardly.

Food establishments can now hold potentially hazardous foods without temperature control for four to six hours if they meet certain time limits and other guidelines. Before this Health Code change, potentially hazardous hot foods had to be maintained at a minimum hot temperature, and cold foods at a maximum cold temperature, at all times. To use Time as a Public Health Control, take the food from temperature control and:

Measure the food's temperature. Cold food must be 41° or colder and hot food 140° or hotter when removed from temperature control. Place a label on the food and write the time the food was removed from temperature control, the

food's starting temperature and the time it will be four hours later.

For cold food, write down the time it will be six hours later. Serve hot food within four hours or discard it.

For cold food, take the food's temperature after four hours and write that temperature on the label. If the temperature is more than 70° at four hours, immediately discard the food. If the temperature is less than 70°, you can hold the food for an additional two hours. You must throw away any food not served within six hours.

For more information on these items, see **Page 81** or visit [nyc.gov/health/foodservice](http://nyc.gov/health/foodservice).

### QUICK REVIEW

1. Previously cooked and refrigerated foods that will be served from a hot holding unit must be rapidly reheated to 165°F using: \_\_\_\_\_
2. When bacteria from a raw food get into a cooked or ready-to-eat food, this is called: \_\_\_\_\_
3. The correct cooking temperature for poultry, stuffed meat and stuffing is: \_\_\_\_\_
4. Thick foods cool faster.: \_\_\_\_\_
5. It is a good practice to thaw frozen foods by leaving them out on the kitchen counter overnight. ☐ TRUE ☐ FALSE
6. Hot foods placed in a refrigerator for cooling must never be covered. ☐ TRUE ☐ FALSE
7. To prevent illness, pork must be cooked to an internal temperature of: \_\_\_\_\_ °F
8. Placing food on the counter overnight can be used as an effective rapid cooling technique: ☐ TRUE ☐ FALSE
9. The Health Code requires that frozen foods be properly thawed before being cooked. The exception to this rule is: \_\_\_\_\_
10. Ground meat and foods containing ground meat must be cooked to an internal temperature of: \_\_\_\_\_
11. Clean bare hands may be used when working with ready-to-eat foods: ☐ TRUE ☐ FALSE
12. When using disposable gloves, they must be changed often to prevent contamination of food: ☐ TRUE ☐ FALSE
13. Hot holding units can be used for reheating foods as long as the temperature reaches 165°F within two hours:  
☐ TRUE ☐ FALSE



## CLEANING AND SANITIZING

The Center for Disease Control (CDC) cites contaminated equipment (utensils, meat slicers, cutting boards etc.) as a leading cause of food borne disease outbreaks. Cleaning and sanitizing are often confused as one and the same, however; these are two separate and distinct processes. *Cleaning* is the process of removing visible contamination – soil, grease, food particles, dirt, etc., from any equipment or utensil. *Sanitizing* on the other hand, reduces harmful microorganisms to an acceptable level, which in turn reduces the possibility of disease transmission.

It is extremely important that all food contact surfaces are clean and sanitary. Any part of utensil or equipment that comes in contact with food is called food contact surface. These may also include surfaces from which food may drip, drain, or splash back on to other food contact surfaces or food. For example, when using microwave ovens, the food particles stuck on the sides or top of the interior of microwave oven may splash or drip back on to the foods being reheated or cooked in the microwave oven.

It is important to note that although most people are familiar with the concept of sanitizing, the proper procedures are often overlooked or misunderstood, especially when it comes to the chemistry and exactness of the process. There are two acceptable methods of sanitizing—*hot water sanitizing* and *chemical sanitizing*.

### Hot water sanitizing

This method of sanitizing involves the use of hot water and a

<i>Chemical Solution</i>	<i>Method</i>	<i>Temperature</i>	<i>Time</i>	<i>Chemical Strength (Concentration)</i>
<b>Chlorine</b> (household bleach With 5.25% Sodium Hypochlorite)	Soaking / immersion	<b>75–140° F</b>	1 minute	50 PPM
<b>Chlorine</b> (household bleach With 5.25% Sodium Hypochlorite)	Swabbing—wiping spraying, pouring	<b>75–140° F</b>	n/a	100 PPM
<b>Iodine</b>	Soaking / immersion	<b>75°+*</b> <small>*High temperature not recommended</small>	1 minute	12.5 PPM
<b>Quaternary Ammonium Compounds</b>	Soaking / immersion	*	*	*

\*As specified by the manufacturer. See label for instructions.

three compartment sink. Items to be sanitized are soaked in hot water at a temperature of 170°F for at least 30 seconds. Generally, the third compartment sink is filled with hot water and heated by as a gas burner or electrical coils; water is heated to 170°F and then maintained at that level. A long handled mesh basket is needed to soak utensils. A thermometer must be used to determine temperature readings.

### Chemical sanitizing

This method requires even more precise knowledge and greater controls than the hot water sanitizing method since the effectiveness of the sanitizer is dependant upon exact amounts of chemicals used. When using commercially prepared sanitizers, simply follow the manufacturer's instructions. The most common way of making a sanitizing solution is by using regular household bleach (5.25% Sodium Hypochlorite). In this respect, ensure that the bleach is not *ultra bleach* or *extra strength bleach*. It is also worth

noting that only pure bleach should be used without any additional additives, and it should never be mixed with detergent which will reduce the strength of the sanitizing solutions.

The following table explains how to make various sanitizing solutions using household bleach (5.25% Sodium Hypochlorite).

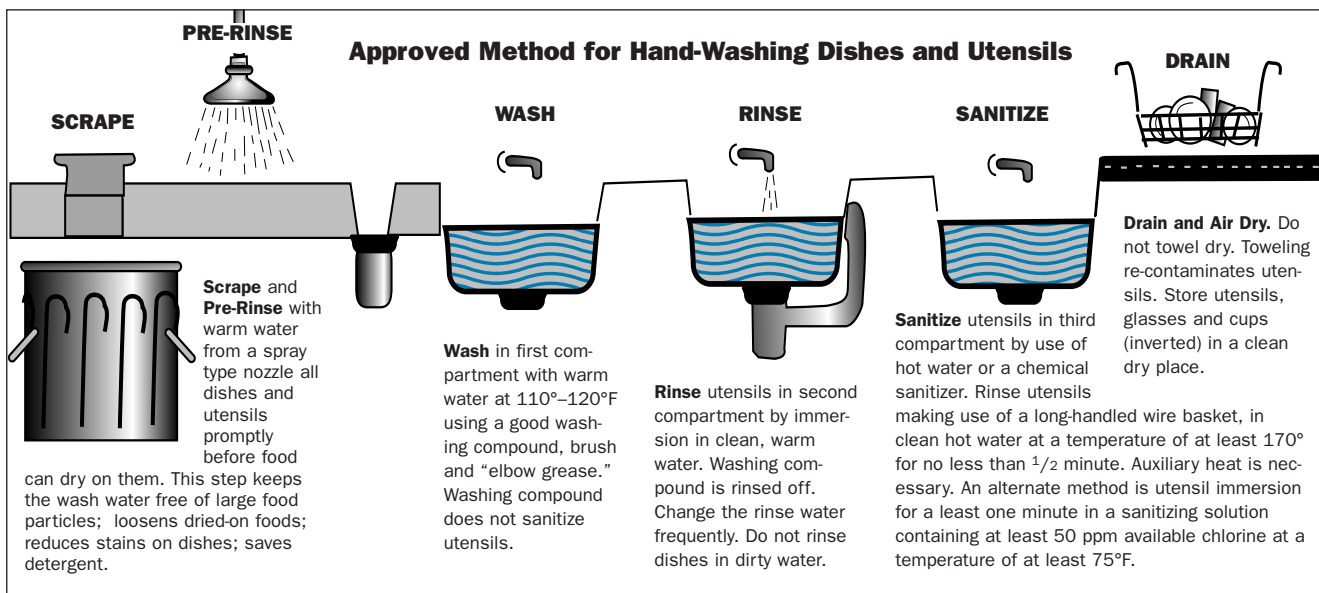
<i>Chlorine Strength (Concentration)</i>	<i>Amount of Bleach</i>	<i>Amount of water</i>
<b>50 PPM</b>	1/2 Oz.	1 gallon
<b>100 PPM</b>	1 Oz.	1 gallon
<b>200 PPM</b>	2 Oz.	1 gallon

The table above provides a guide to using sanitizing solutions for manual sanitizing with different chemicals.

### Wiping Cloths

Sufficient number of wiping cloths for cleaning and sanitizing must be available in every work area. Due to the fact that bacteria





grow and multiply in moist environments, moist wiping cloths must be stored in a bucket of sanitizing solution when they are not in use. The strength of this solution must be at least 50 PPM. The sanitizing solution must be changed frequently since food debris uses up the sanitizer quickly.

## Ware Washing

### Manual Facilities

For manual washing and sanitizing of utensils, a stainless steel sink with no fewer than three compartments should be provided. A two compartment sink may be used for the washing and sanitizing of bar glasses. In these cases an electrical brush device should be used in conjunction with a combination detergent-sanitizer in the sink compartment used for washing utensils. The sink compartments must be large enough to accommodate the largest piece of equipment or utensil to be cleaned and each compartment should be supplied with adequate hot and cold potable running water.

In the case of equipment too large to be sanitized by immersion, the swabbing of such equipment with a solution of at least twice the concentration required for the

sanitizing solution when used for immersion is also acceptable.

### Mechanical Facilities

A commercial dishwashing machine approved by NSF under Standard #3 should be provided. The installation and required appurtenances should be in conformance with NSF Standard #34, the *NSF Manual on Sanitation Aspects of installation of Food Service Equipment*, and applicable code requirements.

Among the specific requirements for installation of machines that use chemicals to achieve sanitization are the following:

- ♦ The chemical sanitizing feeder should be approved for use with the specific make and model of the machine in question.
- ♦ A visual flow indicator is suggested to facilitate monitoring of the operation of the sanitizing agent feeder. Other indicating devices such as audible alarms may also be used. The flow indicating devices should be installed so as to be easily viewed by the operator.

### General

Adequate facilities should be provided for pre-flushing or pre-scraping equipment and utensils.

A floor drain is recommended in the immediate vicinity of the washing area and any area where wet pots, utensils and equipment are air drying.

### Drying Facilities

Adequate facilities must be provided to air-dry washed utensils and equipment.

Adequately sized drain boards, or easily moveable dish tables, fabricated in conformance with NSF standards and separate for soiled and cleaned utensils should be provided.

The drain boards and dish tables should be pitched a minimum of 1/8 inch per foot and drainage directed into a sink so as to prevent contamination of other areas of the dish table or drain board. Drain boards may generally be at least 36 inches to 48 inches long and 30 inches wide.

### Principles of Food Preparation and Service

During food preparation, improper techniques may contaminate the product with disease-causing organisms. It is for this purpose that sanitary procedures must be observed. Listed below are some principles which should be followed.

- ◆ Food that is to be served cold should be kept cold (41°F or less) through all stages of storage, processing, and serving. Thawing of frozen foods should be accomplished in such a manner as to keep the surface and internal temperatures of the product 41°F or less at all times. If frozen food is to be thawed in water, then cold running water is to be used.
- ◆ Foods to be served hot are to be kept so that the internal and surface temperatures do not fall below 140°F. Care must be taken in the cooling of hot foods so they do not become contaminated by dust, contact with work clothes, human contact, etc. Cooling should be accomplished as quickly as possible by the use of an ice water bath, fans, refrigeration, etc. To determine the temperature of foods, a food thermometer is to be used.
- ◆ Partially processed and leftover foods are to be refrigerated at 41°F or below. Just prior to placing the food on the hot-holding unit they are to be removed from the refrigerator and heated rapidly so that the internal temperatures reach 165°F within two hours.
- ◆ The holding of perishable foods between the temperatures of 140°F and 41°F is to be kept at a minimum.
- ◆ Contact of ready-to-eat foods with bare hands is prohibited. Utensils must be used.
- ◆ Do not place packing cases and cans on food work surfaces.
- ◆ When it is necessary to taste foods during processing, a clean sanitized utensil should be used.
- ◆ Foods are to be cooked and processed as close to the time of service as possible.

- ◆ Menu planning should prevent excessive leftovers, and leftovers are not to be pooled with fresh foods during storage.

## Transportation of Foods

In some food operations, it is necessary to transport food from a central kitchen (commissary) to a location where it is finally served. The food transported can be in a ready-to-eat state or a pre-cooked stage, which is finally processed at the place of service. The following practices should be observed to see that contamination is not introduced, or possible previous bacterial contamination not afforded means for extensive multiplication during this period.

- ◆ Transporting containers and vehicles should be clean and of sanitary design to facilitate cleaning.
- ◆ Transporting containers and vehicles should have acceptable refrigerating and/or heating facilities for maintaining food at cold (41°F or below) or hot (above 140°F) temperatures while in transit.
- ◆ Food stored in transporting containers and vehicles should be protected from contamination.
- ◆ A minimum amount of time is to be taken for the loading and unloading of foods from transporting vehicles so foods will not be exposed to adverse temperatures and conditions.

## Food Processing Techniques for Specific Types of Service

### Displayed Food

*(Buffet, Smorgasbord, etc.)*

- ◆ Hot foods are to be kept at or above 140°F on the display table by use of chafing dishes, steam-tables or other suitable methods.

- ◆ Cold foods are to be held at temperatures of 41°F or less before being displayed and must be maintained at 41°F or less while being held for service.

- ◆ All foods displayed are subject to contamination and as such must be discarded at the conclusion of the buffet service.

## Protein Type Salads

*(Tuna, Ham, Shrimp, Egg, Chicken, Lobster, etc.)*

These salads are always served cold and, therefore, all salad ingredients except the seasoning and spices are to be chilled to 41°F or less before use. Celery, which is almost always a component of these salads, should be treated so as to minimize its bacterial content by immersing the chopped celery in boiling water for 30 seconds, using a hand strainer or colander, then chilling immediately either by holding under running cold tap water or by immersing in ice water.

Before the mixing operation, the previously washed can opener and tops of cans and jars holding salad ingredients should be wiped with a clean cloth. The salad ingredients should be prepared in, and mixed with clean, sanitized equipment (sanitary type masher, sanitary mixing bowl, stainless steel long-handled spoon or fork, mechanical tumbler-type mixer, etc.). The mixing operation is to be completed as quickly as possible and the finished salad immediately served or refrigerated.

## Additional Instructions for Specific Salads

- ◆ **Shrimp and Lobster Salad—** Immerse shrimp or lobster meat in boiling water for 30 seconds and then chill to 41°F or less before preparing the salad. Fast chilling can be accomplished by

placing the meat in shallow pans in the freezer or refrigerator or on top of cracked ice.

♦ **Egg Salad**—After removing shells, use a hand strainer or colander to immerse hard-boiled eggs in boiling water for 30 seconds and then chill to 41°F or less before preparing the salad. Chill the eggs by refrigerating or by placing them under cold running water.

♦ **Chicken and/or Turkey Salad**—After removal from bones, immerse chicken or turkey meat in boiling water or boiling stock for 30 seconds and then chill to 41°F before preparing the salad. Fast chilling can be accomplished by placing the meat in shallow pans in the freezer, refrigerator or on cracked ice.

♦ **Ham Salad**—Immerse diced ham in boiling water or boiling stock for 30 seconds and then chill to 41°F or less before preparing the salad. Fast chilling can be accomplished by the same method used for chicken and shrimp.

## Hot Meats and Poultry Served from Steam-tables or Warming Devices

- ♦ Schedule the cooking of meats so they will be completed as close as possible to desired time of service.
- ♦ Upon removal from the oven or stove, cooked meats are to be kept at an internal temperature of 140°F or higher in a steam-table or other suitable device.
- ♦ Maintain the water in the steam-table at a temperature in excess of 180°F. The water must be brought

to this temperature before placing any foods in the steam table. Water in the steam-table shall be kept at a depth level so as to be in contact with the bottom and upper portions of the sides of the food container.

- ♦ Refrigerated ready-to-eat cooked meats, especially leftovers, gravies and stocks, are to be heated rapidly to an internal temperature of 165°F or higher before being placed in the steam-table or warming device. Hot stock or meat gravies may be used to reheat meats. Steam-tables or other warming devices should never be used to heat up cold foods.
- ♦ Cautions noted previously relative to hand contact, care of equipment storage, and menu planning should also be followed.

## Salad Preparation Guide

1) Refrigerate all salad ingredients except seasoning and spices overnight or chill to 41°F or lower before use.

2) Clean work surfaces, equipment and utensils (pots, pans, spoons, spatula, etc.) with soap and hot water, rinse with clean water, and then give a final rinse with sanitizing solution. Stainless steel utensils and equipment are preferred in preparation of these foods.

3) Clean hands, fingernails, and arms thoroughly with soap and hot water and dry with single use paper towels.

4) Individuals preparing cold salads must not touch the ingredients or finished product with bare hands.

5) Clean and sanitize tops of cans and jars before opening. Do not use fingers to pry off can lids or drain off liquid contents.

6) Place diced celery, including pre-cut packaged celery in a strainer and immerse in boiling water for 30 seconds, then chill to 41°F or less.

7) Use clean sanitized utensils in mixing and handling of foods. Avoid hand contact with foods.

8) Refrigerate final salad product immediately in shallow pans.

9) Salads placed in bain-marie cold plates should have a minimum internal temperature of 41°F.

10) Do not fill trays above spill line.



## HACCP FOOD PROTECTION SYSTEM

The Hazard Analysis Critical Control Point system was pioneered by the Pillsbury Company in the 1960's. During this period, the space program was escalating and there was a great need to provide a supply of safe food for the astronauts.

This system involves following the flow of food through every step of the way, from the time the raw products are brought into the establishment to when the finished product is ready to be served to the consumer. By observing food at each step of the production process, it is easy to recognize potential problems and take actions to prevent these problems before they occur.

HACCP is an acronym. Its various parts are:

### H = Hazard

A hazard is any condition in which foods are contaminated by microorganisms, foreign matter or chemicals and in which the microorganisms are allowed to grow or survive.

### A = Analysis

This is the process by which a food item is studied to determine the problems that are likely to occur and how these can be prevented. Not only the ingredients are studied but the analysis includes the available equipment, personnel and the population to be served.

### CCP = Critical Control Point

This is the step at which action MUST be taken to prevent, reduce or eliminate a hazard. Failure to do so at this point will render that food unfit for human consumption. Critical control points will vary depending on the food ingredients, method of preparation and whether it is a hot or cold food. In every food preparation process, some

action can be taken at every step to prevent problems. However, it is at the steps that are determined to be critical control points that some action must be taken.

### Some Frequently Found Hazards

#### *Microorganisms are allowed to grow by:*

- ◆ Improper cooling procedures: not using a method that will reduce food from 140°F to 70°F within two hours and from 70°F to 41°F or less in an additional 4 hours.
- ◆ Inadequate hot holding: holding prepared foods at less than 140°F while awaiting service.
- ◆ Inadequate reheating: previously cooked foods not reheated to 165°F within two hours using a stove or an oven.

#### *Microorganisms are allowed to survive by:*

- ◆ Inadequate cooking: not cooking potentially hazardous foods to the required temperatures.
- ◆ Improper sanitization: dishes, utensils and equipment are not subjected to adequate temperatures or chemicals to destroy microorganisms.

#### *Microorganisms, chemicals and foreign matter are allowed to contaminate food by:*

- ◆ Poor personal hygiene: food workers do not wash their hands before handling food and food related equipment.
- ◆ Ill food workers: food workers allowed to work while suffering from illness that is transmissible through foods.
- ◆ Cross-contamination: allowing ready-to-eat foods to come into contact with raw foods or contaminated equipment.

- ◆ Use of contaminated food or ingredient: using shellfish from unapproved source or meat and meat products from uninspected or unreliable suppliers.
- ◆ Storing acidic foods in metal containers: storing barbecue sauce in galvanized containers.

### Seven Steps of HACCP

The HACCP system as described by the International Association of Milk, Food and Environmental Sanitarians has a series of seven inter-related steps:

#### 1) Identify hazards and assess their severity and risks

The first step in this system is to review recipes to identify potentially hazardous foods or foods containing potentially hazardous ingredients, and set out the preparation process in a flow chart and identify the hazards that can occur at each step in the process.

#### 2) Determine critical control point.

The second step is to identify the critical control points, that is, those steps where action MUST be taken to prevent, reduce or eliminate a hazard.

#### 3) Institute control measures and devise criteria to establish control. (setting critical limits)

The third step is to determine the measures or the actions that are needed to prevent, reduce or eliminate hazards that are anticipated. This is also called the *critical limit*.

#### 4) Monitor critical control points

The fourth step is to monitor what is being done at each critical control point to determine whether the hazards are controlled by the actions set up in the third step.

**5) Take action whenever monitoring results indicate criteria are not met.**

The fifth step is to put in place immediate corrective action if the hazards are not controlled at the critical control points.

**6) Verify that the system is working as planned.**

The sixth step is to review the system to ensure that it is working, that hazards are identified, corrective actions are taken and that a safe food product is produced.

**7) Record keeping.**

Record keeping is done to support and revise HACCP plans as necessary.

**The Food Flow Diagram**

The food-flow chart and an HACCP evaluation can be applied to any potentially hazardous food item or food containing potentially hazardous ingredients. The critical control points will vary in foods depending on the ingredients, method of preparation and whether served hot or cold.

The following diagrams illustrate the process generally involved in the preparation of fried chicken and tuna salad. (*see next page.*)

This system is an invaluable tool when there is cooperation between management and staff. Appropriate equipment must be provided in

sufficient quantities and workers properly trained in their use. Staff must be trained to identify hazards and be provided with written procedures on how to prevent, reduce or eliminate them. These procedures must be reviewed periodically and updated when changes are necessary.

Inspectors from the Department of Health and Mental Hygiene are familiar with this food safety system and are willing to provide guidance.

**QUICK REVIEW**

1. HACCP is an acronym that stands for: \_\_\_\_\_.
2. What are the seven principles of HACCP? \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_.
3. HACCP is a system of \_\_\_\_\_.
4. What hazard is HACCP mostly concerned with? ☐ Physical ☐ Chemical ☐ Biological
5. What is a Critical Control Point (CCP)? \_\_\_\_\_.
6. If potentially hazardous foods are left in the Temperature Danger Zone for more than two hours, what corrective action should be taken? \_\_\_\_\_.
7. Potentially hazardous foods in the refrigerator storage must be discarded when the temperature reaches \_\_\_\_\_°F.
8. When making cold salads such as tuna, it is recommended that ingredients be pre-chilled. ☐ TRUE ☐ FALSE
9. Foods can be kept uncovered during the cooling step? ☐ TRUE ☐ FALSE



**Food Flow Diagram—Fried Chicken**

<i>Process</i>	<i>Hazards</i>	<i>CCP</i>	<i>Criteria for control</i>	<i>Monitoring procedure</i>	<i>Action when criteria not met</i>
<b>Receiving</b>	Unapproved source Salmonella contamination Out of temperature	No	Inspect source. Temperature ≤41°F. No foreign matter.	Check inspection stamp. Measure temperature. Inspect for spoilage.	Return to supplier or discard.
<b>Storage</b>	Insufficient refrigeration space Improper equipment temperature Raw stored over cooked	No	Check food and refrigerator temperatures Store cooked over raw Practice FIFO	Place thermometer in refrigerated equipment Check food temperature Date products Observe storage practices	Provide more refrigeration space and efficient units Discard food if temp. >41°F for > 2 hours or at 70°F or higher
<b>Preparation</b>	Too much out at one time Use of contaminated equipment	No	Practice batch preparation Use sanitized equipment	Maintain food ≤41°F Ensure amount of food out can be processed <2 hours	Discard food if temp. >41°F for more than 2 hours or at 70°F or higher
<b>Cooking</b>	Required temp. not reached resulting in survival of salmonella.	Yes	Uninterrupted cooking to 165°F	Measure temperature at thickest part	Continue cooking until food temp. at thickest part is ≥165°F.
<b>Hot holding</b> (Same day service)	Insufficient equipment Improper holding temp. Patron contamination	Yes	Enough equipment Food at 140°F Sneeze guards and utensils	Check equipment and food temperatures every hour	If food between 140–120°F more than 2 hours, discard If <2 hours -reheat to 165°F.
<b>Cooling</b> (Left overs)	Slow cooling allows for growth of microorganisms	Yes	Reduce from 140 to 70°F within 2 hours; Below 41°F within additional 4 hours Small portions of meat and shallow containers	Measure temp. every hour Keep foods uncovered during cooling	Food temp. 140–70°F more than 2 hours, discard 70–41°F >4 hours, discard
<b>Reheating</b>	Improper equipment Slow reheating Food in temperature danger zone	Yes	Reheat to 165°F within 2 hours Use stove or oven	Check food temperature every hour	If less than 165°F continue reheating

**Food Flow Diagram—Tuna Salad**

<i>Process</i>	<i>Hazards</i>	<i>CCP</i>	<i>Criteria for control</i>	<i>Monitoring procedure</i>	<i>Action when criteria not met</i>
<b>Receiving</b> (Cans of tuna and jars of mayonnaise)	Unapproved source Defective cans Home prepared	No	Inspect source No home canned products	Check cans for defects	Return to supplier or discard
<b>Storage</b>	Under sewer lines	No	In storage area away from sewer lines	Observe storage	Discard
<b>Preparation</b>	Not using pre-chilled ingredients Mixing with bare hands Ill food workers Use of contaminated equipment	Yes	No bare hand contact Ill workers not working Cold food at 41°F or below Equipment/utensils sanitized	Maintain food ≤41°F Use pre-chilled ingredients Sanitize equipment/utensils Use of gloves or utensils Observe hand washing technique Observe worker's health	Discard food if: temp. >41°F more than 2 hours or at 70°F or higher Direct hand contact with ready to eat food Ill worker is working Equipment/utensils contaminated
<b>Cold holding</b> (Same day service)	Food not held at ≤41°F Ineffective refrigeration equipment Patron contamination	Yes	Food temp. ≤41°F Effective refrigeration equipment Sneeze guards and utensils	Measure food temperature during holding every hour	Discard food if: temp. >41°F more than 2 hours or at 70°F or higher

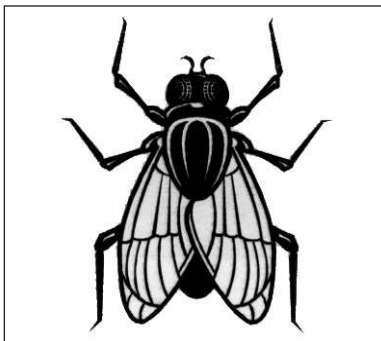
**PEST CONTROL**

**P**est control is a major concern for the operator of a food service establishment. This section reviews the type of pests and the means to control them.

**Flies**

The flying insects in the restaurant industry include the house fly and the fruit fly. The house fly poses the gravest risk to food safety among all of the pests. Several species of house flies are categorized as “pathogenic” or “disease-causing flies”, because they have been proven to carry shigella, salmonella, e. coli and other microorganisms that cause food borne illness. Common house flies are also called “filth flies”, as most of their time is spent in or around filth, including human and animal feces. As these flies walk around this filth, the hair on the body and the legs of the fly picks up the fecal matter along with the harmful microorganisms.

Since flies cannot chew the food, they re-gurgitate or throw-up on the food to dissolve or soften it before eating again. It is estimated that one live fly may carry as many as 28 million bacteria on its body alone, and another 5 million inside. Since the filth fly can travel to all areas of a food establishment relatively quickly and easily, it has the potential to contaminate many foods, food areas and food contact surfaces.



**Flies: Life cycle**

The life cycle of a house fly consists of four stages: egg, larva, pupa and adult. The female of the species can be seen depositing their eggs on suitable breeding materials. Often, the females can be seen in clusters of up to 50 individuals. The female house fly lays individual eggs that pile up in masses of 75 to 150 eggs; in her lifetime, a single female house fly may lay up to 900 eggs.

In warm weather, the white pupae (or maggots) emerge from their eggs in 8 to 20 hours. This larva goes through three stages of development. The total development may take one week or less during warmer seasons, but up to eight weeks during cooler times. The house fly maggot and eggs depend on damp organic material in which to develop and feed. When it has completed its last stage, the fly maggot will move to a cool dry area in which to pupate. They have been known to travel over 100 feet to locate a suitable place to pupate. The pupa transforms into an adult in as little as 3 days or as long as 5 weeks. This pupation period varies with temperature and humidity.

**Flies: Habitat**

House flies prefer decaying organic materials, such as garbage, animal feces or a mixture of soil and garbage on which to lay eggs. Good sanitation and refuse management are the most basic and critical step to managing these pests as this will decrease food and breeding sites. The facility areas where wastes are accumulated, dumpsters, etc. must be cleaned regularly. Trash receptacles need regular washing as flies may find ample breeding media

stuck to the sides and bottom of empty containers. Another good reason sanitation helps manage flies is that fourth stage larva typically leave their breeding area and move away to some distance before they pupate. This behavior removes them from the obvious breeding zones, into less obvious hiding places for safe pupation. Therefore, frequent and thorough cleaning is an extremely important fly management tool.

**Flies: Control**

- ♦ **Vermin-proof facility.** Screen windows, roof vents and other openings with 18 mesh screens. Doors should be self-closing. The back doors or delivery entrances, if present, must have a screened doors.
- ♦ **Drain Cleaning.** It is important to realize that food establishments can become breeding grounds for the house flies, especially in colder months. Drains should be free of any buildup that can attract or provide breeding grounds. We must recognize the importance of humidity and warm temperatures for flies' growth. Ensuring that there are no damp areas in a food facility, and improving drainage will often aid fly management. The floor drains, especially clogged drains, can provide an excellent damp environment for the flies to breed in. The fly breeding areas can be eliminated by keeping all drains clear and through regular sanitation.
- ♦ **Fly traps.** Traps can be an additional management tool to prevent solitary flies from wandering in and contaminating food areas.
- ♦ **Electric fly traps.** There are two kinds of electric fly traps. Both kinds of traps use ultra violet light to attract flies. However, one

electrocutes the fly through the use of electric grid, (“fly zapper”), whereas the other merely stuns and traps the fly in a glue trap affixed to the bottom of the trap (“fly catcher”). The use of fly zappers in a food establishment is a very high risk activity and prohibited, because when the flies are electrocuted, the fly parts can become airborne and fall on exposed food or food areas. The use of “fly catcher” on the other hands is relatively safe as the flies are merely stunned and trapped on the glue trap that can be replaced from time to time.

- ♦ **Trap placement.** Proper trap placement is extremely important. Whenever using traps outdoors, they should be placed strategically to attract flies away from the facility. When installed inside, install them so that they cannot be seen from the outside. If the flies can see these traps from outside, they’ll be automatically attracted to the food facility.
- ♦ **Poisonous baits.** The use of poisonous fly baits can be extremely dangerous in a food establishment. This product can only be used by a licensed pest control officer. Although these are able to rapidly kill a large number of flies, their effectiveness may be short-lived. Work closely with your PCO as these applications inside the facility require special care. Remove or cover all food and ingredients. Cover food contact surfaces before application. Food contact surfaces may have to be cleaned prior to facility start up.
- ♦ **Air curtains.** Air curtains, depending on the season, are simply a blast of steady cold or hot air that flows from a device installed above doorways. Originally designed to cut down on energy costs, these

can prove to be effective against flying insects of all sorts, as the flying insects cannot pass through the air barrier. When placed and used correctly, in addition to flying insects, these can also be effective in keeping out dust and hot or cold air from outside.

### **Fruit Flies**

Fruit flies are very small flies that measure about 1/8 inch in length. The red eyes of the fruit fly are key identifying characteristics. The head and thorax are tan in color with the abdomen somewhat darker. The fruit fly breeds in as well as feeds on over-ripe fruits and vegetables, as well as moist, decaying organic matter.

As the name implies, fruit flies generally tend to be a nuisance when fruits and vegetables are improperly stored or allowed to decay. Garbage that contains fruit peels also will be a frequent target of these flies. When searching for fruit fly breeding sources, look for the decaying moist organic matter. Some of the obvious places to check are fruits or vegetables that are decaying or are stored outside of refrigerators. Other areas to inspect include garbage cans, underneath and behind low laying kitchen equipment. In food service establishments, even small amounts of organic matter can often be found where the equipment legs, tables or cabinets touch the floor. These tiny spaces can harbor thousands of fly larvae. All small cracks and crevices at floor level need to be inspected and thoroughly cleaned.

Once, one of the breeding sources has been located, continue to look for more. Fruit flies easily follow air currents and usually have several breeding places in any structure. Keep an eye on outside envi-

ronment as fruit flies will also come in from nearby dumpsters, outdoor garbage cans or even damp compost piles where fruits and vegetables are disposed. Fruit fly larvae living in fruit which is eaten can cause intestinal discomfort and diarrhea.

### **Fruit Flies: Control**

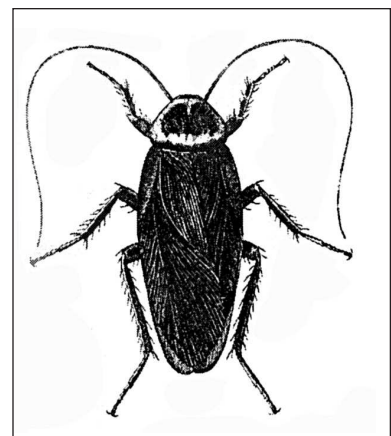
Good housekeeping and a good sanitation program will be highly effective in the long term elimination of this annoying pest. By removing the breeding areas, taking care of the trash, and ensuring proper storage of fruits and vegetables, this problem can be easily eliminated.

### **Cockroaches**

The presence of roaches in food establishments is a serious public health problem. Roaches carry disease-causing bacteria on their bodies and deposit them on the food through their excreta and body contact. They have been linked to allergies in humans and many people with asthma are allergic to “roach dust” - roach body parts and roach droppings. Roach dust is a very strong asthma “trigger”. There are two main types of cockroaches in NYC: German cockroach and American cockroach.

### **German cockroach**

Adult German cockroaches are light brown except for the shield



behind the head marked with two dark stripes, which run lengthwise on the body. Young roaches are wingless and nearly black with a single light stripe running down the middle of the back, and the adults are about 5/8 inch long. Egg capsules are light tan in color and usually yield about 36 baby cockroaches.

German cockroaches are the most common roaches found in houses and restaurants. Most cockroaches have a flattened, oval shape, spiny legs, and long, filamentous antennae. Immature roaches are smaller, have undeveloped wings and resemble the adults. They eat food of all kinds and may hitchhike into the food service establishments on egg cartons, soft drink cartons, sacks of potatoes or onions, used furniture or appliances, beer cases, etc.

Once they find their way into the food establishments, German roaches generally develop their population in kitchens and bathrooms. During the day, these roaches may be found hiding behind baseboard moldings, in cracks around cabinets, drawers or pantries, and in and under stoves, microwave ovens, refrigerators, dishwashers, and other restaurant equipment. The presence of German roaches during the daytime is usually an indication of a severe roach infestation. Most roaches like to live very near to the food and water source.

German cockroach females, unlike the American roaches, carry the egg capsule protruding from their abdomen until the eggs are about to hatch. During the last three or four days prior to dropping her egg case, the female German cockroach does not seek any food or water. The case is then placed in a secluded location, with the nymphs emerging sometimes within the hour or as long as a week. A female may produce four to six cases dur-

ing her lifetime, each containing 30 to 50 eggs. Eggs hatch in 28 to 30 days, and nymphs develop in 40 to 125 days. Female roaches live about 200 days, with males living not quite as long.

### **American Cockroach**

Adult American cockroaches are 1 and 1/2 inches long (38mm), making them the largest of the house-infesting cockroaches. With reddish brown, fully developed wings, the American cockroaches have a yellowish margin on the thorax or body region behind the head. When disturbed, they may run rapidly and adults may fly. Immature cockroaches resemble adults except that they are wingless.

American cockroaches generally live in moist areas. They prefer warm temperatures (around 85°F) and do not tolerate cold temperatures. In food establishments, these cockroaches live in basements, around pipes and sewers, and may move outdoors into yards during warm weather. These cockroaches are common in basements, crawl spaces, cracks and crevices of porches, foundations, and walkways adjacent to buildings. Because of their fondness for sewers, large populations of American cockroaches will be seen in many cities after heavy rains or flooding. Due to the large size and slow development of American cockroaches, large infestations of these insects are not common within food establishments. However, during certain times of the year, these cockroaches may move inside food establishments from outside sources. For example, in winter these cockroaches may move indoors, seeking warmer temperatures and food. Cockroaches may enter food establishment through sewer connections, under doors, around utility pipes, air ducts, or other openings in the foundation.

### **Cockroaches: Control**

It is difficult to prevent the invasion of a food establishment with insects, especially roaches that may come from an adjoining building or in packages delivered to the premises. The emphasis must be placed on elimination of harborage and breeding places within the establishment as well as extermination.

All cracks and holes in the floor, walls and ceilings should be eliminated by filling with cement, plaster, putty or plastic wood. Seams in fixtures and equipment should receive the same treatment.

Equipment and fixtures should be placed flush against the wall and floor; if not, then a sufficient distance away from the wall and above the floor to facilitate cleaning around it.

All potential insect-breeding places, such as rubbish, debris and stagnant water, should be eliminated. Garbage should be kept in tightly covered metal cans, and the cans should be thoroughly cleaned after being emptied. The room, in which garbage is kept, prior to removal, should be constructed of impervious washable material, preferably cement, and should have facilities to wash garbage cans. If this room can be refrigerated, the cold temperature will prevent insects from breeding, and odors from decomposing garbage will be reduced.

Sanitation and good housekeeping are very important factors in insect control. The food establishment and equipment therein should be completely cleaned each night before closing, not only for good sanitation, but to remove all grease, food encrustation, and food particles on which the insects can feed.

In addition, roaches can be destroyed with effective insecticides applied by a licensed pest control operator.



**Pesticide Use.** Operators of food service establishments must ensure that the establishment remains free of pests and must use the methods described in the sections above to prevent pest infestation. Additionally, they may use glue traps and baited traps. However, they may not use chemical pesticides of any kind in the establishment, unless they also possess certification as a “commercial applicator”. This applies even to aerosol cans of pesticides, available at most grocery stores.

**Cockroaches and Allergies.** Cockroaches, particularly German cockroaches, have been identified as the most common source of cockroach allergy in the USA. There are close to a dozen proteins linked to cast skins, droppings or frass or whole bodies that can cause allergies in humans. The allergens are heat stable. One study showed that 40-60% of people with asthma also have a serious allergy to cockroaches.

### **Norway Rat**

The Norway rat (*rattus norvegicus*), the most common rodent in New York City, is a burrowing mammal. A burrow is a hole or tunnel dug into the ground by the rodent to create a space suitable for habitation. This small mammal is not indigenous to the United States, but is believed to have come on the ships from Central Asia around 1700s. Adult Norway rats weigh an average of about 1 pound. Their fur is coarse and the upper body is usually brownish or reddish-gray, while the belly is whitish-gray. Blackish rats may also be present in some locations.

### **Norway Rat: Habitat**

The Norway rats live closely with people. They make their nests by burrowing in the ground. Their

burrows can usually be found in parks or near vegetation, under buildings and other structures, beneath concrete slabs, along stream banks, in garbage dumps, and at other locations where suitable food, water, and shelter are present.

They may also make their burrows beneath sidewalks and along the building foundations. Additionally, an unkempt open space with clutter may also encourage rats to make their burrows. However; being opportunistic, they will also make their nests in between walls, and other open spaces.

The rat burrows are typically located within 25 to 125 feet radius of the food source. Most rats

remain in and around the food establishments and yards which provide their necessities, and unless they are disturbed, they do not move to greater distances.

### **Norway Rat: Habits**

Norway rats can and will eat pretty much any food. However, when given a choice, they select a nutritionally balanced diet.

Their preferable diet includes meats, fish, grains, nuts and cereals. Water is essential for their survival and they require about ½ to 1 ounce of water daily. The water requirement, however, is dependant on the type of food being consumed. Moist foods, whenever available, will lower





their water need. They can easily detect stale and contaminated foods, and often choose fresh items over contaminated ones.

*Tip: Pay close attention to garbage as it offers a very balanced diet and also satisfies their water needs.*

A typical city rat living outdoors has a maximum life span of about one year. In captivity, they may live for up to 3 years. The total time for gestation is roughly 21 to 22 days and litters of 8 to 12 pups are born. Newborn pups grow rapidly. They can eat solid food when they're 2 to 3 weeks old. They become completely independent at about 3 to 4 weeks and become sexually active at 3 months of age, sometimes as early as 8 weeks.

Female Norway rats may come into heat every 4 or 5 days, and they may mate within a day after a litter is born. The average female rat has 4 to 7 litters per year and may reproduce as many as 60 to 70 or more offspring annually. Even though most of these pups will not survive, but on average, about 20 or so are successfully weaned.

Like most rodents, Norway rats are nocturnal. They usually become active at night, when they start looking for food and water. However, rats may become active at day time when rat population is high; their nests are disturbed (due to rain or construction), or when they are starving.

Rats do not see the same way as we do. They have poor eyesight and cannot see beyond 2–3 feet. They're also color blind. However, their other senses are more acute and they depend more on their hearing and their excellent senses of smell, taste and touch. Norway rats are very sensitive to motion up to 30–50 feet away.

Rats use their sense of smell to locate food items and apparently to recognize other rats. An average rat

urinates over 100 times a night and each micro droplet of urine contains various markers or messages. In this manner, the Norway rats, relying on their sense of smell, can recognize pathways, locate foods from previous excursions, members of the opposite sex who are ready to mate, and differentiate between members of their own colonies and strangers from other rat colonies.

Norway rats use hearing to locate objects to within a few inches. This highly developed sense combined with their touch sensitivity can pinpoint the location of the object to within six inches. Norway rats have a highly developed sense of touch due to very sensitive body hairs and whiskers which they use to explore their environment.

Rats feel very much at home in food service establishments due to the familiarity with the areas. Their movement in an area relies heavily on their senses of touch and smell to direct it through movements learned by exploration and knowledge of its terrain.

Rodents, due to their poor vision, also like to rub their bodies against a wall when moving from one location to another. This fact can aid in designing control of this pest, as the grease tracks can be located along floor-wall junctions. Their sense of taste is also highly developed and they can detect impurities or contaminants in the food quite easily. This fact must be kept in mind when selecting appropriate baits.

## House Mouse

The house mouse (*mus musculus*) is a small and slender rodent. When fully grown, an adult mouse weighs about 2 – 5 ounces. The fur of a house mouse is generally grayish-brown. This mammal lives very closely with the humans.

## House Mouse: Habitat

The house mouse lives in and around food service establishments, homes, as well as in any cluttered locations. They are capable of living outdoors, however; they must seek shelter indoors when cold weather arrives.

They prefer seeds and grains, although may eat a variety of different foods. These are very curious mammals and are not hesitant to sample a different variety of food items. They are considered “nibblers” as they nibble on every food in their path, thus leading to the contamination and destruction of many food items. A mouse only needs 2–3 grams of food daily and can survive on very little of water as most of the water is derived from the food it eats.

Like the rats, house mice are also nocturnal. However, it's not uncommon to see them foraging during the day time. Their appearance during the day time does not necessarily indicate an infestation. Like the rats, mice also have poor eyesight, and depend more on their senses of smell, taste and touch.

When shelter inside the food establishment becomes scarce, house mice can also dig and may burrow into the ground, in yards or around building structures. Typically, a nest consists of fibrous material in the shape of a ball. These nests are usually 4 to 6 inches in diameter.

Litters of 4 or 6 are born 19 to 21 days after mating. They grow rapidly and after 2 to 3 weeks, they begin to make short trips from the nest and start eating solid food. Mice are sexually mature as early as when they are 6 to 10 weeks old. Mice may breed year-round and a female may have 5 to 10 litters per year. Mouse populations can therefore grow rapidly under good conditions.

Typically, a mouse normally travels no more than 10–30 feet from its nest to the source of food. They do not compete well with rats and therefore, are not likely to be present in areas frequented by rats. If a food establishment has a rat problem in the basement, it is unlikely that a mouse problem will also exist in the basement. They are more likely to occupy the kitchen on the first floor, living in spaces between walls and baseboards.

One area that is constantly overlooked when rodent survey is conducted is the drop ceiling. The ceiling with its insulation provides an ideal nesting area for colonies of mice. A mouse constantly explores its environment, memorizing the locations of pathways, obstacles, food and water, shelter and other elements in their domain. They quickly detect new objects in their environment, but they do not fear new objects.

### **Rodent Control: Integrated Pest Management (IPM)**

The Integrated Pest Management (IPM) is a system that combines preventive and control measures to eliminate pest infestations. Each year millions of dollars are spent on costly and dangerous pesticides to combat rodent infestations which can also expose humans as well as pets to these poisonous substances. The IPM system combats the rodent problem by using a combination of different techniques, thus reducing exposure to dangerous chemicals.

Integrated Pest Management works on three principles:

- Starve them**
- Build them out**
- Destroy them**

However, for IPM to be successful, the key support principle is the thorough inspection of the facilities to identify the problem. A thorough

inspection of your facility will give you a better indication of the nature and the severity of the infestation, as well as the common routes taken by the rodents. This will allow you or the licensed pest control officer to set up proper traps and baits to intercept them.

There are a lot of signs that could indicate the nature and severity of the problem. These include:

- ♦ **Rodent droppings.** The physical state of the droppings may or may not indicate recent or old infestation. Soft, moist droppings usually indicate live rodent activity, while hard and dry ones indicate old. However, this may not work all the time. The location of the droppings, whether in dark corner or near an area with plenty of sunlight or heat may affect the appearance of scat. Amount of droppings indicate heavy or light infestation. The size of pellets will show if the rodents are large or small; and if different sizes are present, it indicates litters of young are being reared.
- ♦ **Gnawing.** Rodents spend about two percent of their life gnawing on various materials. This is done to grind down the front gnawing teeth that constantly grow.
- ♦ **Rodent Run.** Rat runs are difficult to tell by appearance if they are new or old. Use white chalk or paint on suspected rat runs. The rodents are creatures of habit and will continue to use the same pipe or beam or floor-wall junction. It will leave marks caused by dirt or grease on feet or fur.
- ♦ **Other signs** include *burrows, runways, rodent odors, urine stains, rodent sounds, and live or dead rodents.*

### **Starve Them**

The main purpose of rodents' entry in a food establishment is to

seek food and water. There are many sources of food in a food establishment and by depriving rodents of food and water; we can significantly reduce their population.

The food storage containers must be made of material that is impervious to rodent gnawing. Food containers made of metal, glass or smooth hard plastic is ideal for storage of food items.

There are many opportunities for food particles to spill over on to the floors, behind equipment and other hard to reach places during a normal workday in a typical food establishment. *Every effort must be made to pick up spilled-over food to ensure that rodents will not have a steady supply of food.* Rats need water for survival; eliminating any standing water and other sources of water will also help control their populations.

Improperly stored garbage also provides a steady source of food for rodents. *All garbage containers must be made of metal or hard smooth plastic with tight fitting lids.* Garbage removal must be done on a daily basis.

Mice need even smaller amounts of food and very little water to survive. They can acquire most of the water from the food. Although it is difficult to completely eliminate all food. However, an abundant supply of food will certainly lead to a bigger infestation.

### **Build them out**

One of the reasons rodents exist in buildings is because of favorable conditions that permit them to hide, nest and breed. They will not remain where safe shelter or food is unavailable.

To combat infestation in your premises, it is necessary to be able to recognize rodent harborage or hiding

places, both actual and potential as they are the conditions favoring rodent life and propagation.

There are three general types of rodent harborage:

- **Temporary**
- **Incidental**
- **Structural**

## Temporary Rodent Harborage

These are conditions arising out of failure to maintain premises in a clean and sanitary condition, or faulty methods of operation, house-keeping or storage of stock.

**Examples of temporary rodent harborage include:**

- ♦ Mass storage of office supplies and old records, materials for repairs, food products or other store merchandise; boxes, crates, or cartons that are left undisturbed for periods of time and not rotated in use (using up older stock first).
- ♦ Unused or obsolete fixtures or equipment, especially those having drawers, compartments or other hollow enclosures.
- ♦ Miscellaneous junk, trash, odds and ends placed in closets, cellars, boiler rooms or out-of-the-way places, or portions of premises not in daily use having very little or no light.
- ♦ Garbage cans left uncovered overnight or having poorly fitting covers or in a defective, leaking condition.
- ♦ Passageways used in transporting or storing garbage cans for removal, with spilled particles of food on floors, especially in corners.
- ♦ Accumulations of rubbish at bottom of air-shafts, dumbwaiters or elevator shaft pits, under sidewalk or cellar window gratings or other parts of premises not cleaned regularly.

**Methods to prevent temporary rodent harborage include:**

- ♦ Unused materials should be stored neatly and away from walls, allowing enough space for an individual to pass through during cleaning and should preferably be stored sufficiently high above the floor to permit cleaning underneath. The amount stored should be minimized as much as possible, and it should be disturbed or its position changed at least every three weeks to prevent nesting of rodents.
- ♦ Avoid mass storage by arranging in rows with 2' wide aisles. If stock is placed on shelves, raise the lowest shelf about 6" to 8" above the floor.
- ♦ Promptly clean up food scraps that spill from garbage cans or fall under or behind slop sinks, equipment and stock bins. Rodents feed more readily on these than on bagged or packaged food supplies. Store all garbage in non-leaking metal receptacles with tight-fitting lids.
- ♦ Place soiled linen into suitable containers. Maintain clean and sanitary conditions at all times.

## Incidental Rodent Harborage

These are conditions arising from installation of fixtures or equipment incidental to their use on the premises, in such a manner that hollow spaces, enclosures, and inaccessible places are formed.

**Examples of incidental rodent harborage include:**

- ♦ Fixtures, refrigerators, ovens, etc. not installed flush against walls but leaving a small space that is too narrow for proper inspection and cleaning.
- ♦ Narrow spaces left between bottoms of counters, or other fixtures or equipment and the floor.

- ♦ Small spaces existing between ceilings and tops of fixtures, clothes lockers, refrigerators, closets and cabinets, large overhead pipes and ventilating ducts suspended a few inches from ceiling.
- ♦ Hollow partitions (double wall space).
- ♦ Hollow furniture or fixtures with inaccessible enclosures.
- ♦ Boxed-in casings or sheathing around pillars, pipes, radiators, etc. forming hollow enclosures.
- ♦ Bottom shelves, stock platforms or skids that are not set directly on the floor but allow a space of a few inches to exist underneath.
- ♦ Defective insulated sections of large refrigerators or pipe coverings (hollow enclosed spaces formed by damage to cork or asbestos).
- ♦ Loose foods stored in low, thin, wooden food bins, boxes, cartons, burlap bags, etc.
- ♦ Partially enclosed spaces behind open metal grills used on housing of motors or other mechanical equipment.

**Methods to prevent incidental rodent harborage include:**

- ♦ Eliminate narrow, inaccessible spaces behind fixtures or equipment by placing flush against wall or leaving a space wide enough for inspection and cleaning.
- ♦ Solidly block out narrow spaces underneath, or install flush on floors or raise high enough for cleaning.
- ♦ Avoid providing undisturbed rat runways in narrow space between ducts or long hoods and the ceiling. Ducts should be placed flush against ceilings and preferably be round in shape, instead of square.

- ◆ Remove decorative boxing-in around radiators, columns, etc. to avoid hollow enclosures, or protect with metal flashing extending at least 6" above the floors.
- ◆ Repair and securely close all breaks in insulation around pipes, refrigerators or cooling cabinets.
- ◆ Line interiors of wooden bins with sheet metal, or store foods in rodent-proof containers.
- ◆ Eliminate hollow spaces formed by false bottoms in counters, lockers, cabinets, etc.
- ◆ Alter hollow fixtures so that enclosures are exposed for easy cleaning.

## Structural Rodent Harborage

These conditions are due to design or construction of a building that are defective from a rodent-proof standpoint or that developed during occupancy from failure to make proper repairs or to use rodent-proof materials.

### Examples of structural rodent harborage include:

- ◆ Openings made in outside building walls, around beams, or in interior walls, floors or ceiling for installation of pipes, cables or conduits. They are made by plumbers, electricians or other workmen. The openings are usually larger than necessary and the unused portions of holes are not closed up. Holes, large cracks, loose bricks or other openings in floors, walls or ceilings are other examples.
- ◆ Hollow spaces in double walls, between floor and ceiling of lower story, and in double ceilings of cellars.
- ◆ Enclosed hollow spaces formed by sheathing the undersides of stairways, by installation of false floors in toilets, or by raised wooden floors over earthen floors of cellars.

- ◆ Entrance and cellar doors that are not tight-fitting or not provided with a proper door sill or saddle, permitting openings over 1/4" to exist and not protected around gnawing edges with metal flashing at least 6" above floor level.
- ◆ Openings around ceiling or floor beams, or risers, where they pass through partitions.
- ◆ Openings of fans, ventilators, and louvers on the outside of buildings, or fancy metal grills with openings over 1/4". Cellar floors of earth, enabling rodents to burrow underneath.

### Methods to prevent structural rodent harborage include:

- ◆ Promptly seal up all holes or openings around pipe lines or cables where they enter the building, with concrete mortar or cement mortar to which ground glass may be added for better results.
- ◆ Place tight-fitting metal collars or flanges around pipes and risers. Provide escutcheon plates for all risers where they pass through floor slabs, unless same are water-proof by pockets of mastic.
- ◆ Seal up all openings around beams.
- ◆ Avoid using double-wall type construction with hollow interior spaces, or hollow tile block, hollow cement block, or similar material for partitions or walls of storage compartments or in cellars.
- ◆ Inspect all parts of premises for holes and seal every opening in walls and ceilings with cement plastered smooth. Move away fixtures and stock that may hide holes in floors and use a flashlight so as not to miss any. Look for loose bricks, cracks or other openings

in cellar foundation walls. Find all openings before rodents do. Inspect regularly and repair weak spots before actual breaks occur.

- ◆ Block out hollow spaces under raised wooden floors with concrete. Refrigerators, ranges, ovens, etc. should be solidly based on concrete. Protect entrance, cellar doors and windows with metal flashing around gnawing edges and maintain in good repair.
- ◆ Replace earthen cellar floors with a floor of concrete at least 3" to 4" thick and tied securely into foundation walls.
- ◆ Securely anchor window and door screens to the frames.

## Destroy Them

The use of toxic pesticide in a food environment is a dangerous and risky process. This should only be used as a last resort and even then, only with the help of a licensed pest control officer. The New York City health Code makes it illegal to use pesticides in a food establishment unless used or applied by a licensed pest control applicator.

### Non- toxic Control: Traps

Use of traps is advantageous for many reasons:

- Eliminates the exposure to harmful toxic substance
- Easy to dispose the captured rodent
- Results can be quantified
- Prevents having to deal with odors from dead rodents in hard to reach places

There are many types of traps, they include the following:

- ◆ **Snap Traps.** Among them, the most useful type of trap is the snap trap. However, for it to be effective, following guidelines should be useful:



- Use large number of traps at one time.
- Do not set up traps for several days to allow rats to become acclimated with the traps, as rats are very skeptical of new things.
- When ready to set the traps, use the “mass trapping” technique. In this method, a large number of traps are set up at once so that a large number of rats can be caught before they become “trap-shy”.
- The type of baits used is also an important consideration. It is best to use food items that the rodents constantly go after in the food establishment as these foods are more desirable to rodents and also are part of their diet. However, foods high in protein also make good bait. The rodents, especially during the mating season, need a protein rich diet which is usually hard to get. Therefore, using peanut butter, cheese, ground meat or deli meats is usually found to be effective bait.
- Stale bait must be replaced with fresh bait as rats can detect older foods and avoid it.

- ♦ **Live Traps.** Live traps are large cages or boxes that have only one-way entry. The rodents looking for food get trapped inside. Dubbed as a more humane method, a large number of rodents can be caught at one time.
- ♦ **Glue boards.** Contrary to the popular belief, the use of glue boards has the lowest success rate. Glue boards should only be used as part of the pest control survey. Typically, these traps end up catching baby mice and rat pups. This is because rodents’ whiskers or vibrissae are highly developed sensory devices and can usually

detect the sticky substance on the glue traps and avoid it. The younger populations of rodents haven’t fully developed this sense, and hence get caught.

*Important note regarding the proper disposal of rodents when caught. Safety precautions must be taken to ensure personal safety of the person handling the dead rodents. For example, avoid handling dead rodents with bare hands to prevent contact with diseased animals; when cleaning rodent excreta, spray the area with sanitizing solution prior to sweeping; clean and sanitize any exposed food contact surfaces.*

## Toxic Control: Pesticides

The use of pesticide in the food environment is a very dangerous and risky proposition. *The New York City Health Code does not permit the use of pesticide in a commercial facility unless done by a licensed pest control officer.* Therefore, it is important to obtain the services of a reputable pest control officer (PCO). Be wary of PCOs that promise a quick fix.

## Dangers of Tracking Powder

The use of rodenticide tracking powder is banned in a commercial food establishment. The rodenticide tracking powder has the same ingredients as any other bait being used. However, because the ingredients are mixed with talcum powder or other similar powder carrier, the concentration of toxins are many times higher; in some cases as high as 40 to 50 times. The tracking powder is not absorbed or inhaled by the rodent, rather, the powder sticks to the feet and the fur of the rodent. As the rodent starts grooming itself or others, it ingests the anticoagulant in the tracking powder and because the concentration is much higher, dies within a day or two.

## Pesticide Use in Food Service Operations

Are you harming yourself, your employees, or your customers? You may be without realizing it, if you are using pesticides improperly. You may also be breaking the law.

New York State law requires that anyone using pesticides, except farmers or homeowners on their own property, be certified as a “commercial applicator” with the New York State Department of Environmental Conservation (DEC). This applies even to aerosol cans of pesticides, available at most grocery stores.

Persons applying pesticides in restaurants, institutional kitchens or other food service operations need special certification from DEC’s Bureau of Pesticides Management.

All pesticides are toxic. After all, their purpose is to kill roaches, rats and other pests. Proper use of pesticides is essential to everyone’s safety.

If pesticides are used improperly, food, utensils or other food-preparation equipment can become contaminated. Improper handling of pesticides can also lead to direct exposure through the nose, mouth or skin. The result may be future health problems for those exposed.

Health Department Sanitarians check for proper labeling, storage and use of pesticides during routine inspections of food service establishments.



### Pesticides Do's and Don'ts

**DO** be concerned about your health and safety, and that of your employees and customers.

**DO** ask your pest controller for proof of certification by DEC's Bureau of Pesticides Management.

**DO** report uncertified pest controllers to a DEC pesticide inspector at the DEC Regional Office.

**DO** make a pest's life difficult by maintaining extra-clean conditions and by eliminating possible pest entry routes.

**DON'T** hire an uncertified pest controller.

**DON'T** apply any pesticide in a food service operation yourself unless you are certified.

**DON'T** permit the application of pesticides while food is being prepared or served, or in an area where utensils, unprotected food or containers are stored.

#### For More Information

To learn more about pest control, or for details on how to become certified to apply pesticides, contact the DEC regional pesticide office.

#### Rodent/Insect Control Summary

##### Control Rats and Mice—

- ♦ **Get rid of their nesting places.** Clean up all piles of rubbish, inside and outside the premises.
- ♦ **Build them out.** Block all possible rat entrances. Rat-proof foundations.

♦ **Starve them out.** Protect food at night. Keep garbage containers closed. Do a thorough clean-up job.

♦ **Kill them.** Use traps for temporary control.

##### Control Flies—

♦ **Get rid of their breeding places.** Control the sources.

♦ **Keep them out.** Screen doors and windows properly. See that all doors open out and are self-closing. Install overhead fly fans or air curtains.

♦ **Do a good job of housekeeping.** Keep foods covered. Keep

garbage containers sealed. Remove food accumulations promptly.

♦ **Kill them.** Hire a licensed pest control operator.

##### Control Roaches and other insects—

♦ **Be alert to first signs of infestation.** Destroy contaminated foods.

♦ **Do a good job of housekeeping and storage.** Keep foods covered. Keep garbage containers sealed. Remove food accumulations promptly.

♦ **Kill them.** Hire a licensed pest control operator.

#### NEW

##### SAFE AND EFFECTIVE PEST CONTROL REQUIRED

The presence of insects and rodents or conditions that allow them to flourish, are among the most common violations cited during food service establishment inspections. Pests can contaminate food, making customers sick. The use of chemicals to control pests creates other problems: pesticides can cling to surfaces and many are dangerous. To keep restaurants insect- and rodent-free, the Health Code now requires establishments to:

1. Clean up refuse and other material in or on which pests hide or nest.
2. Seal cracks, gaps or holes that permit easy movement of pests.
3. Eliminate water leaks, drips and standing water as these allow pests to thrive.
4. Install door sweeps or other barriers on doors leading to the outside. Any gap must be less than an eighth of an inch to prevent entry.
5. Throw out food garbage, clean food scraps and grease stains, and store food in containers that close tightly.
6. Inspect the premises and incoming packages each day for signs of pests.
7. Hire a pest management professional licensed by the New York State Department of Environmental Conservation (DEC) to examine the premises at least monthly. Keep records showing the professional's name, address, DEC license number, the services provided and the effective date of the contract.

**QUICK REVIEW**

1. Insecticides and rodenticides can only be applied in a restaurant by the supervisor of food operations?  
☐ TRUE ☐ FALSE
2. The best method of eliminating flies from an establishment is to use an electric fly trap. ☐ TRUE ☐ FALSE
3. List four potential sources of food for rodents \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_.
4. When food is unavailable to mice that have infested a restaurant, they will \_\_\_\_\_.
5. The sighting of rodents during day time may be an indication of rat infestation? ☐ TRUE ☐ FALSE
6. What are some of the signs of rodents or rodent infestation? \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_.
7. Fly strips are not useful in eliminating insect breeding places? ☐ TRUE ☐ FALSE
8. Rats are known to enter buildings through openings that are as small as: \_\_\_\_\_.
9. In insect control, which measures are useful in keeping them out? \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_.
10. Fresh rat droppings in a food establishment is a critical violation? ☐ TRUE ☐ FALSE

**PLUMBING**
**Hand Washing Facilities**

Provide a separate hand washing sink, dispensed hand soap, hand drying device or disposable towels, and waste receptacle for each food preparation area, utensil washing area and toilet room. (Hand-washing sinks must be located within 25 feet of each food preparation, food service and warewashing area, and in or adjacent to employee and patron bathrooms.) The use of a common sink for food preparation or for washing equipment and/or utensils as well for hand washing is not permitted.

Each hand washing sink should be provided with hot and cold running water preferably tempered by means of a mixing valve or a combination faucet. It is recommended that any self-closing or metering faucet should be designed to provide a flow of water for at least 15 seconds without the need to reactivate the faucet.

**Determining Hot Water Supply Requirements**

The hot water supply should be sufficient to satisfy the continuous and peak hot water demands of the establishment. For purposes of estimating the hot water generating capability, assume a supply tempera-

ture requirement of 115°F to each fixture and 180°F to mechanical dishwashing machines.

- ♦ Hot water for hand washing should not exceed 115°F.
- ♦ Hot water for mechanical dishwashers should be 140°F–165°F for washing and 180°F for sanitizing.
- ♦ The water temperature for manual hot water sanitization should be at least 170°F.

**Toilet Facilities**

Toilet facilities should be installed according to local plumbing ordinances. They should be conveniently located and should be accessible to employees and/or patrons at all times.

All food service establishments with a seating capacity of 20 or more except those in operation on or before December 5, 1977 *must* provide appropriately identified and maintained toilet facilities for their patrons. Suitable public notice of any such alternate facility must be conspicuously posted within the food establishment.

Employee toilet facilities may be used by patrons only if they do not pass through a food preparation or utensil washing area to access them and there are separate facilities for each sex.

Toilet rooms should be completely enclosed and have tight fitting, self-closing, solid doors. They should be vented to the outside by an operable, screened window or mechanical device. Fixtures should be designed to be easily cleanable.

**Plumbing and Cross Connections**

Plumbing must be sized and installed according to applicable codes. There should be no cross connection between the potable water supply and any non-potable or questionable water supply. Where non-potable water systems are permitted for purposes such as air conditioning and fire protection, the non-potable water must not contact food, potable water or equipment that contacts food or utensils directly or indirectly. The piping of any non-potable water system should be clearly identified so that it is readily distinguishable from piping that carries potable water.

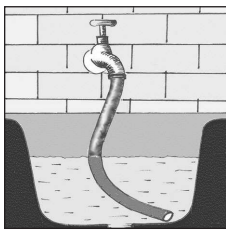
**Submerged Inlet Protection**

The potable water system must be installed to preclude the possibility of back-flow. Devices should be installed and maintained to protect against back-flow and back siphonage at all fixtures and equipment unless an air gap is provided.

The air gap, when used, must be at least twice the diameter of the water supply inlet, but not less than 1", and exist between the water supply inlet and the fixture's flood-level rim.

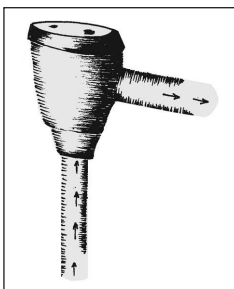
### Vacuum breakers

A primary concern for the safety of potable water is from *cross-connections*. A cross-connection is any connection between potable water supply and sewage, or other contaminated water. This connection allows backflow of contaminated water into potable water systems. In order to prevent against this type of contamination, a *vacuum breaker* must be installed. For instance, a cross connection is made when a hose is attached to a threaded hose bib, and the other end is left submerged in a puddle of waste water. A *hose bib vacuum breaker* only allows water to flow from the potable water source and would prevent the backflow.



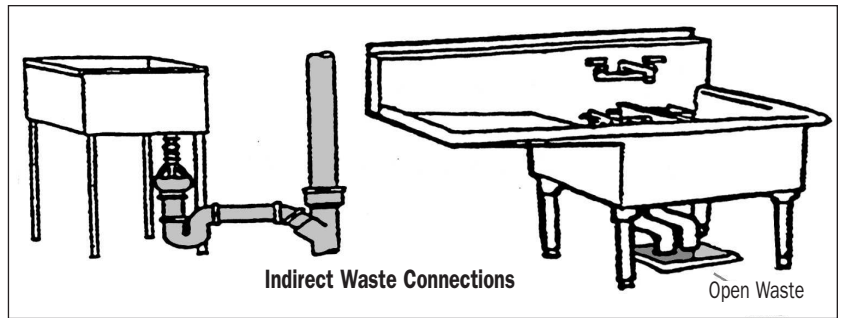
Hose Bib Vacuum Breaker

The same cross connection may also exist between potable water supply and any kitchen equipment that is directly connected. For example, coffee machine, espresso, ice maker, dishwashers, potato peelers, etc. An *atmospheric vacuum breaker* is needed to prevent contamination from these equipment to back into potable water supply.



Atmospheric Vacuum Breaker

Other fixtures and equipment requiring back siphonage protection include:



Indirect Waste Connections

Open Waste

- Water closets
- Hose connections
- Urinals
- Garbage grinders

### Drains–Indirect Waste

There should be no direct connection between the sewage system and any drains originating from equipment in which food or food utensils are placed. An unobstructed vertical air space between the lowest opening of the fixture drain and the flood-level rim of the receiving receptacle or drain opening must be provided. The space must be twice the diameter of the discharge opening or 1 inch, whichever is greater. Unidirectional check valves or equivalent devices are not acceptable for this purpose. Indirect sewer connections should be located within 2 feet of the equipment which it is intended to protect and on the inlet side of the grease interceptor and “p” trap.

Fixtures and equipment requiring indirect waste connections include:

- Food preparation and ware-washing sinks;
- Refrigerators and freezers;
- Ice makers and storage bins;
- Steam tables and kettles;
- Dipper wells.

A grease interceptor should be installed in the waste line leading from pot sinks, floor drains receiving waste from soup or stock kettles, food scrap sinks, scullery sinks and the scraper section of commercial dishwashers to prevent grease from entering the drainage system.

Interceptors should remove an average of at least 90% of the grease or other extractable matter in the waste water and should conform to the requirements of the NYC Dept. of Environmental Protection, Industrial Waste Control Section.

### Lighting

Permanently fixed artificial light sources should be installed to provide at least 50 foot candles of light on all food preparation surfaces and at equipment or utensil-washing work levels. All other areas, including dining areas during cleaning operations, should be provided with at least 20 foot candles at 30 inches from the floor.

Shielding such as plastic shields, plastic sleeves with end caps, shatter-proof bulbs and/or other approved devices should be provided for all artificial lighting fixtures located over, by, or within food storage, preparation, service and display facilities. Shielding should also be provided where utensils and equipment are cleaned and stored, particularly where they may be exposed to extremes in temperature variation.

Heat lamps, where used, should be protected against breakage by a shield surrounding and extending beyond the bulb, leaving only the face of the bulb exposed.

### Gas-Fired Hot Water Heaters

Gas-fired hot water heaters produce carbon monoxide as a waste product. This is an insidious gas that can

result in death when breathed, thus it is imperative that this gas be vented to the outside. Important considerations when dealing with a gas-fired hot water heater are:

- ♦ The vent pipe must be made of rigid material and installed at an upward slope then led to the outside air.
- ♦ The gas flame should be properly adjusted so that it burns in a bluish color.
- ♦ The heater must be tested for back draft at the wind diverter. A severe back draft can extinguish the pilot light and cause an accumulation of gas that can result in an explosion. Also, any blockage can also cause carbon monoxide to accumulate inside the facility.

### Ventilation

All establishments shall be adequately ventilated to prevent excessive heat, steam, condensation, vapors, odors, smoke and fumes. Ventilation to the outside air must comply with applicable law and regulation and must not create a nuisance or unlawful emission. Intake and exhaust ducts must be constructed and maintained to prevent dust, dirt or other contaminants from entering the establishment. Mechanical ventilation must be installed in rooms where odors, vapors or fumes originate. Ventilation hoods and devices must be constructed and installed to prevent grease or condensation from collecting on walls or ceilings and from dripping into food or onto food-contact surfaces.

All hoods should meet NSF Standard #2 requirements and be designed, constructed and installed in conformance with the *National Fire Protection Association Bulletin #96*.

- ☞ **NOTE:** The installation and operation of ventilation systems is regulated by the NYC Department of Buildings, the NYC Fire Department and the

NYC Department of Environmental Protection. For additional information regarding these installations and other requirements, including ventilation hoods, ducts and fire suppression systems (ANSUL), you should contact these agencies.

Cooking equipment ventilation hoods and devices should be designed and installed to prevent grease or condensation from collecting on walls, ceilings, and fire suppression supply piping, and from dripping onto food or food contact surfaces.

Make-up air intakes should be screened (bird screen) and filtered to prevent the entrance of dust, dirt, insects and other contaminating material. Where the introduction of make-up air will cause condensation, drafting or interfere with the exhaust or vapor capture efficiency of the hood, the make-up air should be tempered. A tempered make-up air system may be required if the exhaust is greater than 1,500 cfm.

The installation of fire suppression system supply piping in the unfiltered air space in exhaust hoods should be limited to vertical runs to minimize grease collection. Exposed piping must be cleanable.

Hot water sanitizing dishwashing machines should be provided with adequate ventilation, that is sized according to the manufacturer's specifications.

### Utility Facility

At least one utility sink or curbed cleaning facility with a floor drain should be provided for cleaning mops and for the disposal of mop water or similar liquid wastes.

### Storage

The dry storage space required depends upon the menu, number of meals, quantities purchased and

frequency of delivery. Storage rooms should be located adjacent to food preparation areas and convenient to receiving.

Ideally, the storage rooms should be free of un-insulated steam and water pipes, water heaters, transformers, refrigeration condensing units, steam generators or other heat producing equipment. The area should be well ventilated and maintained at 50°F to 70°F.

Shelving may be constructed of suitably finished wood but preferably of non-corrosive metal or plastic. Approved food containers with tight fitting covers and scoops should be used for storing and dispensing bulk items or broken lots. Food containers should not be stored under exposed or unprotected sewer lines. Items should be spaced from walls sufficiently and raised at least 6 inches above the floor to allow for adequate maintenance and inspection of the facility.

Facilities should be provided to store cleaned and sanitized utensils and equipment above the floor to protect them from splashing, dust, overhead plumbing or other contamination.

Poisonous and toxic materials should be stored in areas designated for such use and for no other purpose, or in a storage area outside the food, equipment and utensil storage area. Bactericides and cleaning compounds should never be stored with insecticides, rodenticides, or other poisonous materials. Insecticides and rodenticides should be kept in their original containers.

### Dressing Room and Lockers

Rooms or areas separate from food preparation, storage or service areas, and separate from utensil washing or storage areas, should be



provided if employees will routinely change clothes within the establishment.

Lockers or other suitable storage facilities should be located in dress-

ing areas for employees to store their personal belongings.

### Garbage Storage

Garbage and waste grease should be placed in durable, easily clean-

able, watertight, nonabsorbent, rodent- and insect-proof containers with tight fitting lids. An area for storage of these containers and facilities for their cleaning should also be provided.

### QUICK REVIEW

1. What is the proper sequence for the manual dish washing operations? \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_.
2. Bathrooms for patrons must be provided when there are 19 seats or more in the dining area. ☐ TRUE ☐ FALSE
3. Cutting boards must be sanitized at least three times a day: ☐ TRUE ☐ FALSE
4. Carbon monoxide poisoning can result from a faulty gas-fired hot water unit. ☐ TRUE ☐ FALSE
5. Equipment, including ice makers and ice storage equipment, should not be located under exposed or unprotected sewer lines, open stairwells or other sources of contamination. ☐ TRUE ☐ FALSE
6. Bathrooms for employees must always be provided: ☐ TRUE ☐ FALSE
7. Wiping cloths must be stored in a sanitizing solution with a strength of: \_\_\_\_\_PPM
8. Between each use, cutting boards must be: \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_.
9. Both employees and customers can use the same bathroom even if customers have to walk through food areas to gain access to it: ☐ TRUE ☐ FALSE
10. When manually washing dishes using hot water sanitizing method, which of the following statements are true:
  - ☐ A. The water must be at 170°F.
  - ☐ B. An immersion basket is needed.
  - ☐ C. A burner or booster is needed to heat the water.
  - ☐ D. A two-compartment sink is necessary.
11. During chemical sanitization, the chemical solution must be checked by \_\_\_\_\_.

## OPERATING A TEMPORARY FOOD SERVICE ESTABLISHMENT: RULES AND GUIDELINES

**F**oods must be obtained from approved sources that comply with all laws relating to food and food labeling. The use of food prepared in any place that is not operated under the jurisdiction of an appropriate regulatory agency and that does not have a current permit or licence to operate, if required, from that agency, is prohibited.

The sale of shellfish (oysters, clams or mussels) from a pushcart or other vehicle in any street or public place is prohibited.

The preparation and service of potentially hazardous foods, including pastries filled with cream or synthetic cream, custards and similar products, and salads or sandwiches containing meat, poultry, eggs, shellfish or fish, is prohibited unless approved by the Department of Health. Only foods which require limited preparation,

such as hamburgers and frankfurters, may be served.

Vendors who intend to sell alcoholic beverages must obtain a license from the New York State Liquor Authority.

Vendors must maintain their establishments, and prepare and store foods in accordance with the New York City Health Code and the New York State Sanitary Code.

Vendors must meet all other requirements, conform to all other applicable laws, obtain their Permit or Certificate of Registration prior to the event, and obtain a Food Protection Certificate, when required.

The Permit, Certificate of Registration, and the Food Protection Certificate must

be conspicuously posted at the Temporary Food Service Establishment whenever it is in operation.

### Food protection:

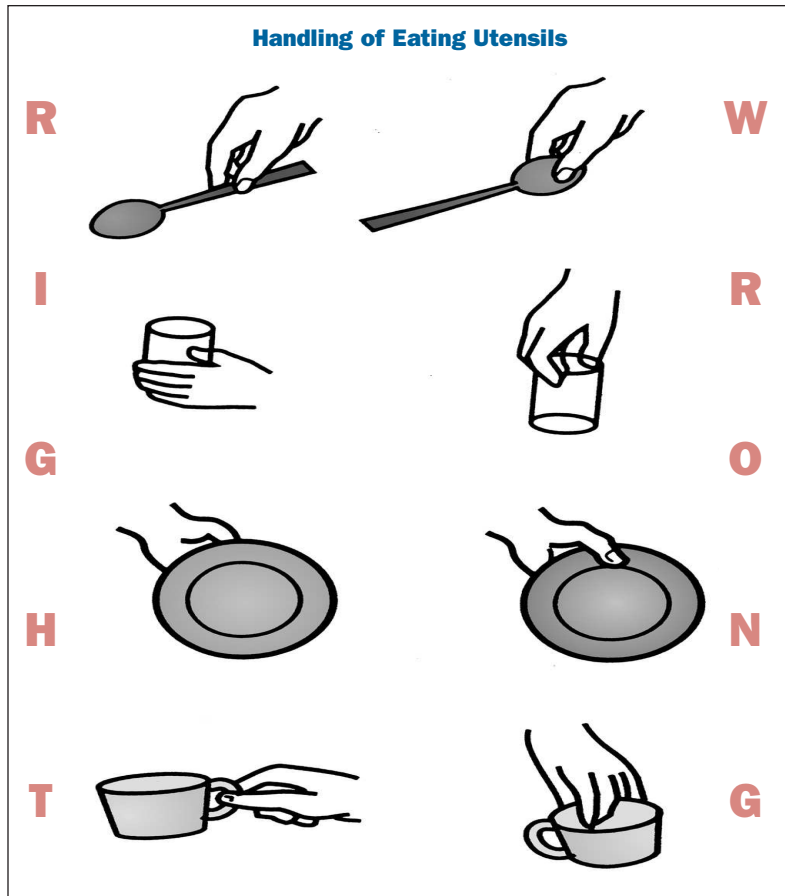
Wash your hands before starting work and each time after contamination including coughing, sneezing or handling unclean items. Prepackaged moist towelettes (containing alcohol as a base ingredient) may be used to cleanse hands in non-processing establishments.



**Food Protection Certificate**



### Handling of Eating Utensils



Wash your hands with soap and water after using the toilet.

Never allow hands to come in contact with food that will not be cooked. Use clean sanitized utensils, deli paper, disposable gloves, etc.

Keep all foods covered or otherwise protected from outside contamination. Keep all food service equipment, utensils, and paper goods similarly protected from outside contamination.

Use only single service dishes and utensils for service to patrons.

**Handle single service eating utensils** in a manner that prevents contamination of surfaces that come into contact with foods.

Store all food, food service equipment, utensils, and paper goods off the ground at all times.

Do not prepare foods if you are ill or have cuts or infections on your hands.

Do not smoke, eat or drink while working. Wear clean outer garments and effective hair restraints.

Prepare foods as close to transportation or service time as possible.

#### Cook:

- poultry to at least 165°F for 15 seconds

Temperature °F (°C)	Time
130 (54)	121 Minutes
132 (56)	77 Minutes
134 (57)	47 Minutes
136 (58)	32 Minutes
139 (59)	19 Minutes
140 (60)	12 Minutes
142 (61)	8 Minutes
144 (62)	5 Minutes
145 (63)	3 Minutes

- pork or any food containing pork to at least 155°F for 15 seconds
- ground meats to 158°F for 15 seconds
- other foods to at least 145°F
- shell eggs or food containing shell eggs to at least 145°F
- rare roast beef and/or rare beef steaks as per chart below

Reheat potentially hazardous hot foods to at least 165°F (73.9°C).

Stir with sanitized utensils.

Maintain all potentially hazardous foods at 140°F (60°C) or above.

Maintain all potentially hazardous cold foods at 41°F (5°C) or below.

Sanitize all food contact surfaces and equipment. Chemical sanitization solution may be prepared by mixing one tablespoon of bleach with each gallon of cool, potable water. Do not add soap or detergent to the water, because they reduce the effectiveness of the solution. Rinse wiping cloths frequently in the sanitizing solution.

#### Structure and Equipment:

Ensure that the walls, base, floor and food contact surfaces are of sanitary construction, and made of non-corrosive, non-rusting metals. Surfaces must be waterproof, smooth, readily cleanable and resistant to dents and scratches.

Provide proper waste receptacles. All waste receptacles must be vermin-proof and provided with tight-fitting lids.

Enclose or guard cooking and serving surfaces to provide protection against air-borne contamination.

Prevent accidental injury by contact with cooking devices. Shield cooking devices against possible contact with patrons.

Obtain appropriate permits for the use of propane gas. Properly secure propane tanks. Tanks must be in an upright (vertical) position and provided with a base plate anchor as security against accidental toppling. The connection from fuel tank to burner must be of either a rigid metal tube or an approved, flexible metal tube; connections at fuel tanks and burners must be free of leaks.

**Water requirements:**

There are no sink or hot and cold water requirements for non-processing establishments; however, make available acceptable means of keeping hands clean (e.g., moist towelettes).

Provide an adequate supply of potable (drinkable) water for food preparation, cleaning and sanitizing equipment, and hand washing in processing establishments.

Place waste water in a leak-proof container labeled “waste water” with a tight-fitting lid. Dispose of waste water into a public system or a sewage disposal system constructed, maintained and operated according to the law.

**REQUIRED POSTINGS (SAMPLES)**

The following signs, produced by the Department of Health and Mental Hygiene, can be obtained from the Department of Consumer Affairs, 42 Broadway, NY, NY. Please visit [on.nyc.gov/restaurant signs](http://on.nyc.gov/restaurant signs) for a complete checklist of all the required New York City signs.

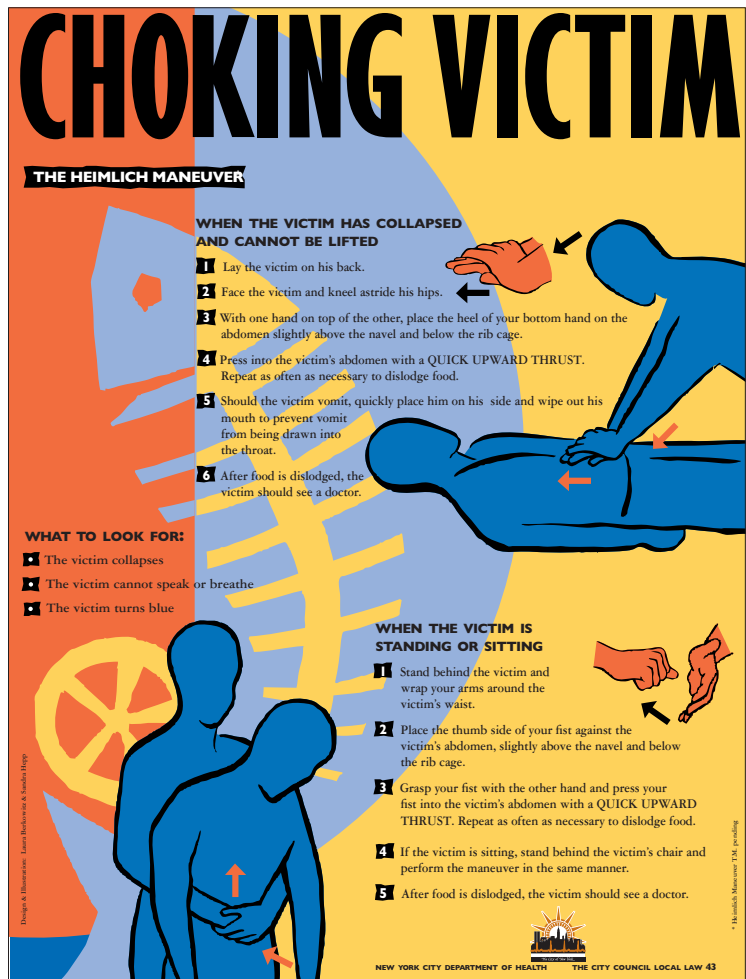
**WARNING**

**DRINKING  
ALCOHOLIC BEVERAGES  
DURING PREGNANCY  
CAN CAUSE  
BIRTH DEFECTS**



NEW YORK CITY DEPARTMENT OF HEALTH  
AND MENTAL HYGIENE  
THE CITY COUNCIL Local Law 63

Alcohol and Pregnancy. *Post conspicuously.*



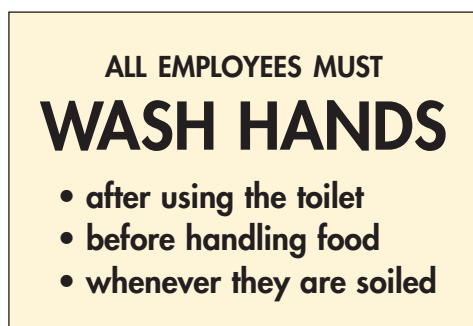
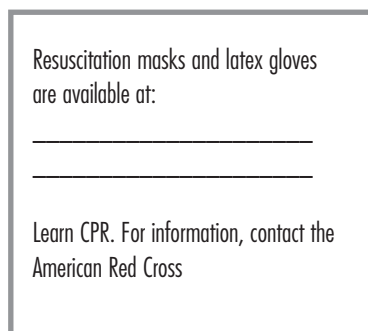
Heimlich Maneuver. *Post conspicuously.*

## REQUIRED POSTINGS (SAMPLES)

The following signs can also be obtained from the Department of Consumer Affairs, 42 Broadway, NY, NY . Please visit [on.nyc.gov/restaurantssigns](http://on.nyc.gov/restaurantssigns) for a complete checklist of all the required New York City signs.



If cigarettes are sold. *Post conspicuously.*



### QUICK REVIEW

- "First Aid Choking" poster must only be displayed conspicuously in each designated eating area:  
☐ TRUE ☐ FALSE
- All food establishments must display an "Alcohol and Pregnancy Warning" sign. ☐ TRUE ☐ FALSE
- A "Wash Hands" sign must be displayed at all hand washing sinks. ☐ TRUE ☐ FALSE

**REDUCED OXYGEN PACKAGING (ROP)**
**What is Reduced Oxygen Packaging (ROP)?**

Reduced oxygen packaging (ROP) is a procedure that results in a reduced oxygen level in a sealed package. The air we breathe has approximately 21% oxygen and therefore any packaging option that results in less oxygen is classified as ROP.

**Types of ROP**

Types of processes considered as ROP include Cook Chill Packaging, Sous Vide and Vacuum Packaging.

- ♦ **Cook-chill** is a process in which cooked food is hot filled into impermeable bags from which the oxygen is expelled and then sealed or crimped closed.
- ♦ **Sous Vide** is French for "under vacuum". It is a method of cooking in which raw or partially cooked food is placed in a hermetically sealed, impermeable bag, and heated for an extended period of time at relatively low temperatures.
- ♦ **Vacuum Packaging** is removing air from a package and hermetically sealing it.

**What is Reduced Oxygen Packaging (ROP)?**
**Safety Concerns**

The ROP does not allow the spoilage microorganisms to grow thereby extending the shelf life of the product. However, as a result of the reduction in oxygen, a suitable environment may exist for certain pathogenic bacteria such as *Clostridium botulinum* and *Listeria monocytogenes* which thrive in the absence of oxygen. This can lead to serious food borne illnesses that can be fatal.

**Safety Guidelines**

In order to ensure the safety of ROP foods, multiple barriers against the growth of pathogenic microorganisms such as *C. botulinum* and *L. monocytogenes* are needed.

Some of the acceptable barriers include:

- pH of 4.6 or below
- Water activity (aw) below .85
- Presence of high levels of non-pathogenic competing microorganisms (raw meats, poultry, fermented cheeses with live cultures, etc.)
- Freezing

**Enforcement and regulation**

Food establishments interested in obtaining approval for Reduced Oxygen Packaging must follow Department of Health's regulations. These include instructions that regulate how the food is packaged, what equipment is used to package and cook it, what internal temperatures the food must reach, and how it must be rapidly chilled and stored.

A Hazard Analysis Critical Control Point (HACCP) plan for each food item must be submitted and approved by the NYC Department of Health and Mental Hygiene before ROP for that food is permitted at a retail food establishment.

For further information on Reduced Oxygen Packaging and submission of HACCP plans, please contact the Bureau of Food Safety and Community Sanitation at 212-676-1600/01 or use the following link:  
<http://home2.nyc.gov/html/doh/downloads/pdf/rrii-red-oxygen-packaging.pdf>

**LOCAL LAW 83**
**CPR Regulations**

Taverns and restaurants that sell food for on-premise consumption are required to have resuscitation equipment on the premises. Resuscitation equipment required includes:

- ♦ 1 adult exhaled resuscitation mask
- ♦ 1 pediatric exhaled air resuscitation mask
- ♦ 2 pair of latex gloves
- ♦ A sign notifying the customers where the equipment is located

These masks must be certified for use by the U.S. Food and Drug Administration. A notice must be

posted to indicate to customers that the resuscitation equipment is available, where it is available, and where they can learn CPR. This information can be provided on a sign or on the menu. The owners of the establishment or the staff are under no obligation to use the equipment or give medical assistance to a victim.

To learn CPR and for more information, contact the American Red Cross.

**LOCAL LAW 83**
**Regulation Restricting the Sale of Tobacco Products to Minors**

Retail sellers of tobacco products are prohibited from selling tobacco products to persons under 18 years of age.

- ♦ Sales may be made only to individuals who provide a driver's license or other photographic identification issued by a government entity or school indicating that the person is at least 18 years of age.

- ♦ No employee under the age of 18 is permitted to sell, dispense or handle tobacco products unless that employee is under the direct supervision of the retailer or another employee who is at least 18 years of age and is on the premises.

- ♦ Sales of cigarettes or other tobacco products that have been removed from packaging which bears the health warning is prohibited.
- ♦ Retailers must post a sign in a conspicuous place with the following statement:

**“SALE OF CIGARETTES, CIGARS, CHEWING TOBACCO, POWDERED TOBACCO, OR OTHER TOBACCO PRODUCTS TO PERSONS UNDER EIGHTEEN YEARS OF AGE IS PROHIBITED BY LAW”.**

The sign referred to above can be obtained from the Department of Consumer Affairs, 42 Broadway. If you wish to post your own sign, the law requires that the sign be printed on a white card in red letters at least one-half inch in height.

**LOCAL LAW 47**
**New York City  
Smoke-Free Air Act of 2002**

Local Law 47, the New York City Smoke-Free Air Act, was signed into law on December 30, 2002. The Act makes virtually all workplaces in the City of New York smoke-free, including many places where smoking had previously been permitted. All work sites are required to develop, distribute and post their smoke-free policy, in

accordance with the law, which became effective on March 30, 2003.

**Why the law is needed**

Tobacco use is the leading epidemic of our time, killing more than 440,000 people nation-wide each year. In 2002, approximately 1,000 New Yorkers died because of exposure to second-hand smoke.

**What businesses are affected?**

The law, which went into effect on March 30, 2003, made virtually all establishments and businesses with employees smoke-free. These include:

- All office buildings, factories, and warehouses.

- All private offices and previously designated “smoking lounges.”
- All food service establishments, restaurants, and catering halls.
- All bars, including bars in restaurants.
- Membership associations.
- All areas of theatres.
- Banks, educational and health care facilities, and child day care centers.
- Shopping malls and retail stores (where goods are sold or rented to the public).
- Sports arenas, roller and ice-skating rinks, billiard parlors, bingo halls, bowling establishments, and other similar places.
- Public transportation facilities, reception areas, and waiting rooms.



**To comply with the new law:**

1. Update your workplace smoking policy to reflect the new law.
2. Talk with your customers and employees about the law and prepare them for the changes.
3. Discuss the new law with employees including what they should do to comply with the law:
  - Request any person smoking to refrain from smoking inside the workplace.
  - Refer to the law and to workplace policy when dealing with refusals to not smoke in the work place.
  - Remind them that the business or building owner may be assessed fines for infractions.
  - Request staff to report problems directly to the management or owner of the business, or to the building's management.
4. Post "no smoking" signs at all entrances as required including bathrooms, stairwells on each floor, bulletin boards, and other prominent places.
5. Remove all ashtrays from the premises as required.
6. Contact the NYC Department of Health and Mental Hygiene for additional information, to register a complaint, and for compliance support at 3-1-1. In addition, the Department's website at [nyc.gov/health](http://nyc.gov/health) will be updated with the most current information.



**Exceptions**

The New York City Smoke-Free Air Act has been modified by passage of a new State law, the New York State Clean Indoor Air Act of 2003, which became effective July 24, 2003. The law voids some of the exemptions in the New York City law passed in December 2002. The few rare exceptions to the smoke-free policy that became effective July 24, 2003, are:

- Tobacco bars that were in existence on December 31, 2001, that sells or rent tobacco products and devices, and that derive 10% or more of their income from these sales or rentals;
- Non-profit membership associations with no employees.

The above facilities must apply for an exemption and register with the New York City Department of Health and Mental Hygiene.

- In any restaurant, smoking is limited to 25% of seating in a single outdoor dining area. An outdoor dining area is defined as one with no roof, overhang, or other ceiling enclosure.
- Residential and certain day treatment health care facilities may provide smoking rooms for some patients.
- Hotel rooms that specifically allow for smoking (not public areas such as lobbies, meeting rooms, bars and restaurants).
- Retail tobacco stores devoted primarily to the sale of tobacco products; sale of other items account for less than 50% of total annual gross sales.
- Tobacco promotional events (with specific parameters).

Under the New York City Smoke-Free Air Act of 2002, previous exceptions for owner operated bars and separate smoking rooms in bars are no longer permitted due to restrictions in the State Clean Indoor Air Act.

Remember: This law does not apply to private homes. For a more detailed explanation of exceptions, registration, and regulation requirements, visit the Department's website at [nyc.gov/health](http://nyc.gov/health).

**Penalties**

Each violation will be subject to fines.

**First violation:** Civil penalties of not less than \$200 and not more than \$400.

**Second violation (*within 12 months of the first violation*):** Civil penalties of not less than \$500 and not more than \$1,000.

**Third or subsequent violation (*within 12 months of the first violation*):** Civil penalties of not less than \$1,000 and not more than \$2,000.

The New York City Department of Health and Mental Hygiene may suspend or revoke the permit of an establishment that is found in violation of the law on three separate occasions within a 12-month period.

**Enforcement**

The New York City Department of Health and Mental Hygiene's Bureau of Food Safety and Community Sanitation is responsible for enforcement of the law as part of its current inspection operations. Inspections may also be performed in response to complaints. Enforcement began on March 30, 2003, when the law went into effect. You can register complaints by calling 311.

**LOCAL LAW 67**

**Tobacco Vending Machine Regulations**

Distribution of tobacco products through vending machines is prohibited in all food service establishments except taverns. Also known as bars, a “**tavern**” is an establishment where alcoholic beverages are sold and served for on site consumption and in which the service of food, if served at all is incidental to the sale of such beverages.

Service of food shall be considered incidental if the food generates less than 40% of total annual gross sales.

Taverns that operate a cigarette vending machine must ensure that the vending machine:

- ♦ Be placed at least 25 feet from any entrance to the premises and directly visible by the owner or his employee.
- ♦ Have a sign affixed to it, which is visible to the public, which identifies the wholesale or retail dealer's:

Cigarette license number  
Expiration date of license number  
License holder's name  
Place of business  
Phone number

- ♦ Have a third sign which states that the sale of cigarettes to minors is prohibited. The sign must be in red lettering on a white card. It must be displayed conspicuously. This sign is available free of charge at the Department of Consumer Affairs 42 Broadway, NYC.

**NYC HEALTH CODE EXTRACTS**

The following sections, extracted from the New York City Health Code, are presented here because they related specifically to permit suspension, revocation and the inspection process.

**§3.1 5 Interfering with or obstructing Department personnel; gifts, gratuities and bribes.**

(a) No person shall interfere with or obstruct Department personnel in carrying out an inspection, survey or examination or in the performance of any other duty for the Department or Board.

(b) No person shall give or offer a gift, gratuity, benefit, favor or bribe, including but not limited to money, food, and drink, to an employee or agent of the Department engaged in carrying out an inspection, survey or examination or in the performance of any other duty for the Department or Board.

**Notes:**

This section is derived from S.C. §186. The section has been expanded to include interference with or obstruction of any Department personnel during the performance of any duty for the Department or Board.

The section heading was amended and subsection (b) was added on October 6, 1992 to specifically prohibit the giving or offering of

gifts, gratuities, benefits, favors or bribes, or any other thing of value to an employee of the Department in the course of the performance of duty by such employee.

*Section 566 of the Charter provides for right of entry of officers of the Department. See also, section 3.01 and the annotations thereto, particularly Frank v. Maryland, 79 S. Ct. 804 (1959), District of Columbia v. Little, 339 U.S. 1, 70 S. Ct. 468, 94 L. Ed. 599 (1950) and People v. Maddeus, 5 A.D. 2d 886, 172 N.Y.S. 2d 607 (2d Dept. 1958) aff'd without opinion 4 N.Y. 2d 1003, 177 N.Y.S. 2d 517 (1958). For a case interpreting S.C. §186, see People v. Strudled, 96 Misc. 650, 161 N.Y.S. 1105 (Gen. Sess. 1916).*

**§5.17 Suspension and revocation by Board or Commissioner.**

(b) The Board may suspend or revoke any permit for willful or continued violation of this Code or for such other reason as the Board determines is sufficient grounds for suspension or revocation.

(b) When, pursuant to this Code, a permit is issued by the Commissioner, he may suspend or revoke such permit for willful or continued violation of this Code or for such other reason as he determines is sufficient grounds for suspension or revocation.

(c) When, pursuant to this Code, a permit is issued by the Commissioner, he or she may suspend or revoke such permit for the giving or offering to an employee or agent of the Department engaged in carrying out an inspection, survey or examination or in the performance of any other duty for the Department or Board, a gift, gratuity, benefit, favor or bribe, including but not limited to money, food, or drink.

(d) (1) When a permit is issued by the Commissioner pursuant to this Code, he or she may suspend such permit for failing to answer or appear for a hearing, or respond to a finding or notice of violation or order issued by the Department and answerable to the Administrative Tribunal established by Article 7, or any other tribunal having jurisdiction to hear and adjudicate violations of this Code.

(2) A permit suspended pursuant to subdivision (1) hereof shall remain suspended unless and until the default is vacated or the penalty imposed if any is satisfied. The action of the Commissioner suspending a permit pursuant to this subsection shall not be stayed upon the filing of an appeal in accordance with Section 5.21 of this Code.

(e) All permits revoked pursuant to this section shall be surrendered forthwith to the Department.

### Notes:

This section is derived from S.C. §191(e). The first clause of that section, “Notwithstanding any other provision of the Sanitary Code or any of the regulations thereunder” has been omitted as unnecessary.

Authority to delegate to the Commissioner the power to issue permits, by way of Code provision, is expressly contained in Charter §561 which provides in part: “Whenever the board of health in the sanitary code authorizes the issuance, suspension or revocation of a permit by the commissioner, his action shall be subject of review by the board of health upon an appeal by the party aggrieved under such rules as it may provide. “Sections 5.17 through 5.21 constitute such rules. The same section of the Charter expressly authorizes the Board, “. . . in its discretion [to] grant, suspend or revoke permits for businesses or other matters in respect to any subject regulated by the department.” Note that the Charter §558(c) empowers the Board to “. . . embrace in the sanitary code all matters and subjects to which the power and authority of the department extends, not limiting their application to the subject of health only.” On the power to regulate by way of license and the imposition of a license fee, see *Smart v. City of Albany*, 146 Misc. 60, 260 N.Y.S. 579 (Sup. Ct. 1932).

Subsection (c) was relettered to subsection (d) and new subsection (e) was adopted on June 26, 1990 to authorize the Commissioner to suspend a permit when the person or entity holding the permit fails to respond for a hearing.

New subsection (c) was added and subsections (c) and (d) were relettered to subsections (d) and (e) on October 6, 1992 to clearly establish as a ground for revocation or suspension of a permit the giving or offering of gifts, gratuities, benefits, favors or bribes, or any other thing of value to an employee of the Department in the course of the performance of duty by such.

### QUICK REVIEW

1. Smoking may be permitted only at the bars. ☐ TRUE ☐ FALSE
2. "No Smoking" signs must be posted at all smoke free areas. ☐ TRUE ☐ FALSE
3. Ashtrays are permitted on dining tables as long as "No Smoking" signs are conspicuously displayed. ☐ TRUE ☐ FALSE
4. Tobacco vending machines are prohibited in all food service establishments except taverns or bars. ☐ TRUE ☐ FALSE
5. Any food service establishment that allows on-site consumption of food must provide a cardiopulmonary resuscitation (CPR) kit in case of an emergency. ☐ TRUE ☐ FALSE

## FOOD DEFENSE STRATEGIES

*Prepared by New York State Department of Health: A Self-Assessment Guide for Food Service Operators*

### Why Should I be concerned about Food Defense?

The retail food establishment is the front line in protecting our food supply. Thousands of people stop every day to have a snack, a drink or a full meal at a restaurant. There are countless opportunities to tamper with food.

### What can I do about it?

Even a small incident can bankrupt a food establishment. Take the time to perform this self-assessment of your operation. It can help you lower your risk of being a target and also can improve your work practices.

### Why do a self-assessment?

A self-assessment will take less than an hour and will provide you with a valuable snapshot of your operation. Self-Assessment is a powerful management tool. By examining your operation, you may find ways to improve not just security and safety, but general work practice.

### How do I do a Self-Assessment?

There are three basic steps to self-assessment:

- 1) Document your operation. Write down what you do and how you do it. To find out what is really happening, ask your employees to describe in detail how they do each task. Use the checklist at the end as a guide.
- 2) Compare your systems to recommended practices or standards. This chapter provides information on food safety and security practices. Note areas where you can make changes.
- 3) Get help where you need it. Consult experts, including your local health department, vendors and your police department, for

advice on how to best address your specific safety and security issues.

### YOUR FACILITY

Unrestricted access to your operation makes it an easy target for food tampering or other terrorist activity.

#### Key Points

- Restrict customers to public areas only.
- Limit facility access to employees and contractors only.

### Security Strategies

**Property Security.** This could include any of the following:

- Do a walk-through inspection of your facility and storage areas daily.
- Provide outside lighting. Make it difficult for someone to approach your facility without being seen.
- Request regular police patrols.
- Provide fences or other barriers around your property.
- Provide surveillance. An alarm system or video surveillance system is expensive. If there has been a problem with building security in the past, however, it may be a wise investment.

#### Building Security

- Close and lock service doors, except during deliveries
- Discourage loitering.
- Restrict key access to trusted employees. Know who has keys at all times.

### YOUR EMPLOYEES

Your employees and their training are vital to food safety and security

#### Key Points

- Do employee background checks and verify information given.

- Train employees to recognize security risks and report them to management.
- Ensure each shift manager knows what to do if an incident occurs.

### Security Strategies

**New Employees** Perform complete background checks on all potential employees. Verify references, phone numbers and information on immigration status and criminal record.

Actively supervise new employees to ensure that they learn and follow established procedures.

**All Employees.** Keeping experienced employees is an excellent security strategy. In addition to establishing mutual trust, your employees will perform at a higher level of skill.

- Train all employees to recognize food safety and security threats, including food tampering. Train employees to report problems to a supervisor immediately.
- Limit employee access to areas needed for their job functions.
- Keep a roster of all employees expected on each shift and discourage off-duty employees from loitering.
- Keep personal items out of the work and storage areas. Have a separate place to store personal belongings.

### YOUR PRODUCTS

The products you buy and how you store and use them are critical in protecting your business.

#### Key Points

- Know who delivers to your facility and what they deliver.
- Have someone available to accept all deliveries.
- Store food and non-food items separately and secure all products.

## Security Strategies

### Receiving

- Purchase food products from known vendors.
- Ask for identification from unknown delivery people.
- Schedule deliveries to arrive only when staff is present.
- Inspect all items for damage upon delivery and check against your invoices.
- Take temperatures of chilled foods before accepting. Don't accept refrigerated deliveries over 41°F.
- Do not allow food to sit in the receiving area. Store food as soon as possible in the designated location.

### Storage

- Store food and non-food items separately. Keep all items securely.
- Lock all storage areas, including outside storage, when unattended.
- Know the types of chemicals you have on hand and dispose of chemicals no longer used.
- Secure chemical storage areas.

## YOUR FOOD PREPARATION STEPS

Food preparation practices can lower your risk of problems

### Key Points

- Examine ingredients before using them. Don't use a food that has an unusual look or smell.
- Develop a routine for all tasks. When food is prepared the same way every time, it is easier to know if something is not right.

## Security Strategies

### Food Preparation

- Inspect cans and packages for damage prior to using.
- Examine ingredients before use and don't use a food that has an unusual look or smell.
- Establish standardized procedures for food preparation and train employees in these procedures.

Routinely check that those procedures are followed.

- Cook foods thoroughly to destroy food pathogens.
- Use a calibrated probe thermometer to check temperature every time.
- Strictly enforce "no bare hand" policies (use of gloves and tongs) with ready-to-eat foods.

### Food Holding

- Know safe temperatures for hot and cold holding and check temperatures often.
- Hold hot food above 140°F.
- Cold holding units, such as sandwich prep units, should keep products below 41°F. Keep lids and doors closed.
- Limit hot holding unit access to preparation and service staff.

## YOUR CUSTOMER SERVICE AREA

Control of the service area prevents product tampering

### Key Points

- Place self-service stations, such as salad bars and buffets, in areas where staff can easily supervise them.
- Beware of anyone lingering in the self-service area.

## Security Strategies

### Customers.

- Keep customers out of food preparation areas.
- Do not discuss your security measures with anyone.
- Be aware of anyone lingering in self-service areas or anyone who seems overly interested in your operations.
- Be alert for packages and bags left unattended.

### Self-Service Areas

- Place self-service areas like salad bars where staff can watch them.
- Put out only as much food as you need.
- Replace food containers when replenishing salad bars or buffets. Don't add new food to old containers.

- Rotate foods such as croutons or condiments regularly.

## YOUR CLEANING PRACTICES

One of the best defenses against foodborne illness is your cleaning and sanitizing routine.

### Key Points

- Follow instructions on using equipment and cleaners exactly. Improper use can lessen the cleaning effect.
- Clean and sanitize as often as possible.

## Security Strategies

### Cleaning

- Use only chemicals approved for use in a food establishment.
- Follow directions for cleaners and sanitizers exactly. Too little or too much detergent or sanitizer can actually be less effective! Ask your supplier for advice.
- Clean and sanitize equipment and work areas after each use.
- To ensure proper sanitizing, check water temperature or sanitizer concentration frequently.

### Chemical Storage

- Store chemicals away from food preparation areas.
- Secure chemical storage areas at all times.
- Use cleaners and sanitizers according to manufacturer's recommendations.
- Discard old chemicals as instructed on the label.

The Food Defense Assessment Checklist is available at:  
[http://www.health.state.ny.us/nysdoh/enviro/food/docs/food\\_defense\\_strategies.pdf](http://www.health.state.ny.us/nysdoh/enviro/food/docs/food_defense_strategies.pdf)



## TRANS FAT WHAT EVERY RESTAURANT AND FOOD SERVICE ESTABLISHMENT NEEDS TO KNOW

Trans fat in food raises a person's "bad" cholesterol (LDL) and lowers "good" cholesterol (HDL), increasing the risk of heart disease. Today's consumers are increasingly looking for a healthy alternative on the menu. Taking artificial trans fat out of your kitchen is one important way to serve your customers and your business.

### What is Trans Fat?

A small amount of trans fat in our diet is naturally occurring but the largest source of trans fat is artificially made. Artificial trans fat is made when hydrogen is added to vegetable oil. These oils are called "partially hydrogenated." Any food made with partially hydrogenated oil contains trans fat.

**Partially Hydrogenated Vegetable Oil  
= Trans Fat =  
= Heart Disease Risk**

### What Ingredients Contain Trans Fat?

Restaurants commonly cook and fry with partially hydrogenated oils. Other common restaurant ingredients that contain artificial trans fat are vegetable shortenings and margarines.

### What Restaurant Foods Commonly Contain Trans Fat?

- ♦ **Fried and pre-fried foods:** French fries, fried chicken, chicken nuggets, fish fillets, tortilla chips, taco shells and donuts.
- ♦ **Baked goods:** Hamburger buns, crackers, cookies, pizza dough, cakes, pies and pastries.
- ♦ **Premixed ingredients:** Pancake mix, hot chocolate, salad dressing, croutons and breadcrumbs.



Why is trans fat bad for you?

### Why is Artificial trans fat so bad for you?

	Dangerous LDL "bad" cholesterol	HEALTHY HDL "good" cholesterol
Unsaturated Fats	Lowers	Raises
Saturated Fats	Raises	Raises
Trans Fats	Raises	Lowers

All these products are available without trans fat (made without partially hydrogenated vegetable oil).

### Spot the Hidden Trans Fat in Your Kitchen

You won't know if you are serving trans fat unless you check for the words "partially hydrogenated" on the ingredients list on all packaging; *avoid using these products!* Here's a sample ingredient list:



The FDA now requires that Nutrition Facts panels on all packaged foods sold to consumers must list trans fat content. However, foods sold only to restaurants are not required to provide this information. Be sure to check the ingre-

dients list on all products. Some packaged foods may list 0 grams of trans fat on their Nutrition Facts panel, but also list partially hydrogenated oil in their ingredient list. Companies can say a food is "0 grams trans fat" if it contains less than 1/2 a gram per serving. If partially hydrogenated oil is on the label, the food is *not* trans fat free.

### Clear Your Kitchen of Trans Fat

- ♦ Change your oils and switch to a cooking oil that is not hydrogenated and avoid shortening or hard vegetable oil.
- ♦ Instead of stick margarine or butter, choose soft tub spreads with saturated and no trans fat.
- ♦ Buy prepared foods with no trans fat! Ask your food suppliers for baked products, pre-fried and packaged foods that are made without partially hydrogenated vegetable oil.

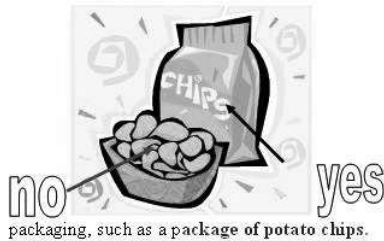
### The City's Trans Fat Regulations

New York City's Health Code amendment phases out the use of

artificial trans fat in all food service establishments required to hold a New York City Health Department permit, including restaurants, caterers, mobile food-vending units, and mobile food commissaries:

## Beginning July 1, 2008

1. No food containing partially hydrogenated vegetable oils, shortenings, or margarines with 0.5 grams or more trans fat per serving may be stored, used or served by food service establishments. The regulation does not apply to food served in the manufacturer's original, sealed package, such as a bag of potato chips.



You will need to save the label for any oils, shortenings, or margarines used for frying, pan-frying (sautéing), or grilling, or as a spread, until the product is completely used. Labels may be kept on the product container, photocopied, or kept separately.

III. You will need to save the label for any oils, shortenings, or margarines used for frying, pan-frying (sautéing), or grilling, or as a spread, until the product is completely used. Labels may be kept on the product container, photocopied, or kept separately.

## How do I tell if a particular product is allowed under the regulation?

- ◆ **Step 1:** Look at the package label or ingredients list to see if "partially hydrogenated," "shortening," or "margarine" are listed. If none

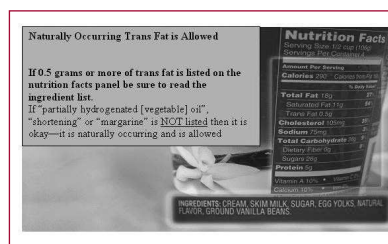
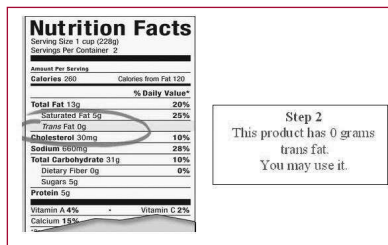
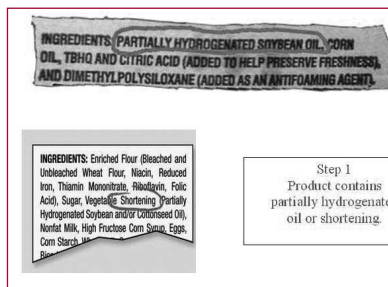
of these terms appear, you may use the product. If any of these terms are listed, go to Step 2 to see if the product contains too much trans fat.

- ◆ **Step 2.** Check the Nutrition Facts panel for trans fat content. If the panel says the product has 0 grams of trans fat, or less than 0.5 grams of trans fat per serving, you may use the product. If the Nutrition Facts panel says the product has 0.5 grams or more trans fat, you may not use the product. *If there is no Nutrition Facts panel on the product, go to Step 3.*
- ◆ **Step 3.** If there is no Nutrition Facts panel, ask your supplier to provide a letter from the manufacturer listing the product's ingredients. If the ingredients list contains the words "partially hydrogenated," "shortening," or "margarine," the letter must also include information on the

amount of trans fat in each serving. As in Step 2, if the product has 0 grams of trans fat, or less than 0.5 grams of trans fat per serving, you may use it. The letter should be on the manufacturer's letterhead and show the manufacturer's name and address. Keep the letter at your food service establishment, available for review by a NYC DOHMH inspector.

Also beginning July 1, 2008, when the regulation takes full effect, you will need to save the label for any food containing oils, shortenings, or margarines, regardless of how you use the product. For instance, if you are frying frozen French fries, you should save the label for both the frying oil and the French fries until both have been completely used.

When buying containers of oil that are shipped in a box, the containers may not have labels but the box should. Save the ingredients label and the Nutrition Facts panel from the box along with the product's brand name and common name, until the product has been completely used. These labels should be available for review by a Health Department inspector.



**TRANS  
FORMING  
NYC**  
2007

How can  
you tell if  
a product  
is  
allowed?

**SAMPLE SPEC SHEET 1**  
A manufacturer's or distributor's documentation will ideally contain  
the components highlighted by the arrows below.

XYZ Baking Company  
222 Riverbank Street  
Nice Town, NY 12222  
800-555-1212

Manufacturer's name, address  
and phone number

Ingredients for 10" round *German Chocolate Cake*

Specific product  
name.

Ingredients:  
Enriched flour (bleached and unbleached wheat  
flour, reduced iron, niacin, thiamin mononitrate,  
riboflavin, folic acid), sugar, buttermilk, butter, water,  
eggs, semi-sweet chocolate (sugar, chocolate liquor,  
cocoa butter, anhydrous dextrose, milkfat, soy  
lecithin, natural and artificial flavors), vanilla, baking  
soda, salt.

Ingredients listed in order by  
weight from heaviest to lightest.

Trans fat content information is not required since the  
ingredients do not include one or more of the following:  
"partially hydrogenated (vegetable) oil", "shortening" or  
"margarine".

## Switching To "0 grams" Trans Fat Products...

### Replacing Trans Fat: Prepared Foods and Mixes

- Bakery Items such as cookies, cakes, pies
- Packaged Baked Goods such as hamburger buns, tortillas and empanadas
- Pan-fried foods such as french fries
- Baking mixes and hot chocolate; nondairy creamer

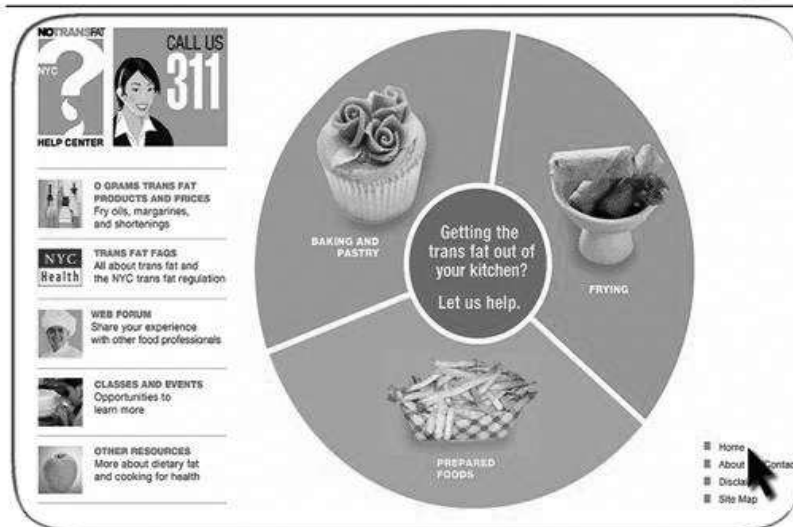
0 grams trans fat  
versions of these  
items

### Replacing Trans Fat: Baking

Vegetable shortening  
and margarine

- 0 grams trans fat shortening
- 0 grams trans fat margarine
- Butter
- Lard
- Vegetable Oil

## The Trans Fat Help Center notransfatnyc.org



### What Your Establishment Needs to Know about Posting Calories on Menus and Menu Boards

New York City Health Code Section 81.50 requires covered food service establishments (FSEs) that hold New York City Health Department permits to post calorie information prominently on menu boards and menus. Covered FSEs, including mobile food vending units, within New York City must post calorie information prominently on menus and menu boards. The requirement applies to FSEs that:

- Are required to hold a New York City Department of Health and Mental Hygiene (NYC DOHMH) permit.
- Belong to a group of 15 or more FSEs that operate under common ownership or are individually franchised, whether locally or nationally, or do business under the same name.
- Offer substantially the same menu items, in servings that are standardized for portion size and content.

A Food Service Establishment subject to this regulation must post calorie information on:

- All menu boards and menus.
- Item tags—food items displayed for sale with food item tags.
- Any other list or pictorial display of a food item or items and price(s) posted and visible within the food service establishment.
- Menu boards or adjacent stanchions at or prior to the point of ordering for drive-through window.

*This requirement does not apply to menu items that are listed on a menu or menu board for less than 30 days in a calendar year.*

For additional information please call 311 or go to [http://www.nyc.gov/html/doh/downloads/pdf/cdp/calorie\\_compliance\\_guide.pdf](http://www.nyc.gov/html/doh/downloads/pdf/cdp/calorie_compliance_guide.pdf)



## WORKPLACE SAFETY AND HEALTH

Employers of food service establishments not only have a responsibility to safeguard public health, but also responsibility to provide a safe and healthy workplace for their employees. Under the U.S. Occupational Health and Safety Administration (OSHA), employers must also provide their employees with a workplace free from recognized hazards causing or likely to cause death or serious physical harm.

Health and safety hazards and risks for workers may be found throughout food establishments, especially in the kitchen. Some of the most common injuries to restaurant workers are:

**Muscle strains, sprains and tears** from slips, trips and falls; overexertion in lifting; repetitive motions; reaching and twisting.

**Cuts and lacerations** from knives; food and beverage processing machinery such as slicers, grinders and mixers; and broken glass.

**Burns and scalds** from hot liquids; hot oils and grease; heating and cooking equipment such as ovens and grills; hot pots and trays; and steam.

### Controlling Hazards

How can you prevent injuries among your workers?

#### 1) Training

One of the least expensive and most essential ways of preventing work-related injuries is through training. Every new employee should receive an orientation and be trained in health and safety policies and procedures. Additionally, training your workers on a regular basis ensures

that new hazardous conditions or other safety problems are reported and discussed. Be sure to get input from your workers on how to resolve problems. Workers often come up with the best ideas on injury prevention!

The majority of food service workers in New York City are foreign-born. Written materials on safety rules and policies should be available in languages understood by your staff. Check with the DOHMH Restaurant Worker Health & Safety project for available educational materials (212-788-4290).

#### 2) Check Your Workplace

Use the *Restaurant Safety Checklist* to do a quick assessment of your safety program facility for areas needing improvement. The checklist below can be used to audit your workplace on a daily or weekly basis. A more comprehensive checklist tool for more periodic audits is available through the DOHMH Restaurant Worker Health and Safety program. Auditing your workplace helps to document corrective actions needed, identify responsible parties, and track expected remediation date and verification of action taken. The tool should be used annually or as often as necessary.

##### ◆ Slips, trips, and falls

- Pathways/exits are free of trip hazards.
- Pathways and exits should be marked, well lit and have mirrors on the blind corners.
- Spills are cleaned up immediately.
- Floors around fryer and grill are kept free of grease.
- Floors around dishwasher are kept clean and dry.

- Workers are wearing slip resistant shoes.

##### ◆ Cuts and lacerations

- Guards are used on meat slicers, bread/bagel slicers, mixers, etc.
- Workers who use electrical machinery keep long hair tied back and remove loose jewelry and rings.
- Knives are out of the sink and in a designated drawer or rack.
- Tamps, push sticks, or other tools are used to feed or remove food from grinders, slicers, and choppers.

##### ◆ Burns

- Pot holders, mitts, and gloves are used to handle hot items
- Pot handles and cooking utensils are turned away from edges of counters or stove fronts.
- Heated oil is never left unattended and is cooled before handling.
- Workers get assistance when moving heavy or large pots of hot liquid.

##### ◆ Electrocutions and fires

- Damaged electrical cords, broken plugs, and broken equipment are taken out of service. Grill exhaust filters are cleaned daily.
- Portable fire extinguishers are fully charged, in operating condition and available in the kitchen and public assembly space.

##### ◆ Muscle strains and sprains

- Workers use safe lifting techniques and get assistance for awkward or heavy items.
- Rubber floor mats are in place and cleaned daily.
- Get help whenever lifting heavy objects.

#### 3) Implement Solutions

Don't wait until the next accident, injury incident to take action! Once you've assessed your workplace, identify the steps needed to correct the problem. See some possible solutions for common restaurant hazards in the following table.



INJURY	HAZARDS	POSSIBLE SOLUTIONS
<b>Sprains and Strains</b>	Lifting heavy loads Awkward reaches Repetitive movements	Provide smaller bus pans and trays. Use hand trucks to assist with lifting. Train workers on safe lifting methods. Lift heavy items only when necessary. Get assistance in lifting heavy items. Store heavy items on lower shelves. Use ladder and footstools instead of reaching. Rotate tasks that require the same motion over & over.
<b>Slip, Trip and Fall Injuries</b>	Wet floors; grease spills. Reduced vision when carrying sacks or large boxes on stairs Cluttered walkways, storage areas	Mop up spills promptly. Make sure workers wear correct shoes with slip resistant soles. Provide rubber mats in non-greasy areas (dish washing). Ensure mats remain clean and in place. Use no-skid waxes and floor surfaces coated with grit. Make sure stairways are well lit. Place brightly colored hazard tape on top and bottom step.
<b>Cuts and Lacerations</b>	Knife cuts Faulty machinery Broken glass	Keep knives sharp, store knives properly. Provide the proper knives for the specific task and train workers on having the right knife for the job. Inspect regularly to make sure safety devices, such as guards, are in working order
<b>Burns and Scalds</b>	Splattered oil Hot pots and pans Steam Grease/electrical fires	Make sure food is dry when placed in hot oil. Workers should wear chef jackets (long sleeved) to protect their upper bodies. Wait till oil in deep fryers is cool before handling or transferring. Provide oven mitts, dry towels to handle hot equipment. Open lids on hot pots away from body. Keep handles pointed away from stove edge. Install fire suppression system in kitchen. Ensure vent hoods and grease traps are regularly cleaned. Replace frayed/faulty electrical cords and plugs.
<b>Workplace Violence</b>	Dealing with irate customers Robberies Domestic violence towards staff Violence between customers	Keep cash register funds to a minimum. Vary the time of day that the register is emptied. Count cash in a secure room. Provide training so that workers can defuse potential violence. Develop plan and train workers on dealing with hostile customers. Coordinate with local police precinct.
<b>Transportation Incidents</b>	Motor vehicle injuries Car accidents; Runover	Equip bicycle with reflectors and bell. Wear safety gear (reflective vest, helmet). Back up mirror for delivery trucks. Do not use cell phone while riding/driving.
<b>Exposures to harmful substances</b>	Pesticides Cleaners Refrigerants Infectious materials (blood from cuts & needles, etc.)	Label all hazardous substances. Store separately. Use only the amount necessary to get the job done. Ensure good ventilation when using cleaners. Install carbon monoxide alarm near heating and cooking equipment and carbon dioxide monitors in areas where dry ice or CO2 gas tanks will be used. Train workers on avoiding exposure and using personal protective equipment.

## Bike Safety for Delivery Workers

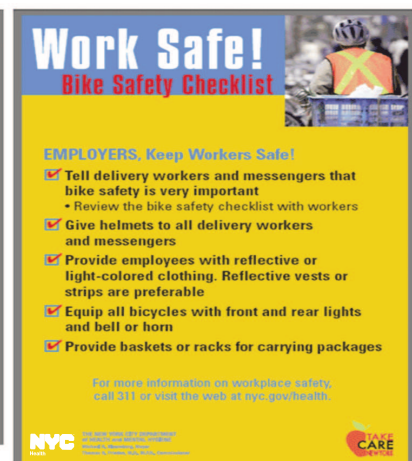
Bicycle delivery workers face a serious risk of injury or death. Between 1996 and 2005, 225 bicyclists died in crashes. Nearly all bicyclist fatalities occurred as a result of crashes with motor vehicles and most crashes occurred at or near intersections. Nearly all bicyclists who died (97%) were not wearing a helmet.

## The Law

City laws require businesses to supply their bicycle delivery workers with helmets and other safety devices. The laws also require that commercial bike riders wear the helmets while cycling on the job. Employers must provide each bicycle delivery worker with:

- Helmet that meets city safety standards
- Lamp
- Bell
- Brakes
- Reflectors

*See the brochures below for more information on how to keep yourself and your employees safe.*



**EMPLOYERS: READ THESE TIPS AND POST FOR YOUR EMPLOYEES TO READ TOO.**



## EVERY RESTAURANT CAN ACHIEVE AN Avoid Common Sanitary Violations



**Follow the steps below to practice A-grade food safety and keep your customers safe from food-borne illness. Avoid the most commonly cited violations and improve your chances to achieve an "A."**

### **Be sure employees are trained in basic food safety and supervised by someone who has a food protection certificate.**

- Arrange work schedules so that a supervisor with a food protection certificate is on duty whenever your restaurant is receiving or preparing food, or is open to the public.
- Train supervisors to use the Self-Inspection Worksheet to regularly evaluate and improve the restaurant's condition and employees' food safety practices.
- Provide food safety training for all employees who handle food.

### **Hold food at the proper temperature.**

- Review Health Department rules for temperature-holding requirements.
- Be sure equipment used to hold hot and cold food is working properly.
- Use thermometers to monitor the temperature of foods in hot or cold storage.
- Track food taken from hot or cold storage, and record how long it is out.

### **Control conditions that promote pests.**

- Seal all cracks, crevices and holes in walls, cabinets and doors to prevent rodents, cockroaches and flies from entering.
- Install rodent-proof door sweeps on outside doors.
- Store food and garbage in pest-proof containers.
- Clean grease, oil and food particles from all surfaces and equipment, including the floor underneath.
- Keep range hoods clean and grease-free.
- Contract with a pest control professional licensed to work in restaurants.

### **Protect food from contamination during storage, preparation, transportation and display.**

- Keep food covered until served.
- Keep food separated by temperature and type. Avoid cross-contamination by separating potentially hazardous foods (like raw poultry) from ready-to-eat items (like salad mix).

### **Maintain all food surfaces.**

- Clean and sanitize all food-preparation surfaces after each use; remove caked-on food.
- Repair or replace deeply-grooved cutting boards and chipped or broken surfaces so they can be properly sanitized.

### **Maintain all non-food surfaces.**

- Review Health Department rules on acceptable materials; surfaces should be smooth and cleanable.
- Keep all surfaces clean.

### **Maintain all plumbing and check it frequently.**

- Monitor all plumbing fixtures and make needed repairs **immediately**.
- Be sure plumbing is fitted with approved devices (valves, anti-siphonage pieces, vacuum breakers) to prevent backflow.
- Clean and maintain grease traps.

**NYC**  
Health

**Michael R. Bloomberg**  
Mayor

**Thomas Farley, M.D., M.P.H.**  
Commissioner

March 2012

# Form 198E Food Establishment Inspection Report

NYC DEPARTMENT OF HEALTH & MENTAL HYGIENE - DIVISION OF ENVIRONMENTAL HEALTH - FOOD ESTABLISHMENT SANITARY INSPECTION REPORT																																												
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<b>Food Temperature</b> 2A <input type="radio"/> 10 <input type="radio"/> 28 2B <input type="radio"/> 0 <input type="radio"/> 8 <input type="radio"/> 9 <input type="radio"/> 10 <input type="radio"/> 28 2C <input type="radio"/> 0 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 2D <input type="radio"/> 0 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 2E <input type="radio"/> 0 <input type="radio"/> 5 <input type="radio"/> 6 2F <input type="radio"/> 0 <input type="radio"/> 8 2G <input type="radio"/> 0 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9 <input type="radio"/> 10 <input type="radio"/> 28 2H <input type="radio"/> 0 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9 <input type="radio"/> 10 <input type="radio"/> 28 2I <input type="radio"/> 0 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 2J <input type="radio"/> 0 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9 <input type="radio"/> 10 <input type="radio"/> 28	<b>Food Source-Criticals</b> 3A <input type="radio"/> 10 <input type="radio"/> 0 <input type="radio"/> 28 3B <input type="radio"/> 10 <input type="radio"/> 0 <input type="radio"/> 28 3C <input type="radio"/> 0 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9 <input type="radio"/> 10 <input type="radio"/> 28 3D <input type="radio"/> 0 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9 <input type="radio"/> 10 <input type="radio"/> 28 3E <input type="radio"/> 10 <input type="radio"/> 0 <input type="radio"/> 28 3F <input type="radio"/> 10 <input type="radio"/> 0 <input type="radio"/> 28 3G <input type="radio"/> 0 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <b>Vermis/Garbage</b> 8A <input type="radio"/> 0 <input type="radio"/> 2 <input type="radio"/> 0 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 8B <input type="radio"/> 0 <input type="radio"/> 2 <input type="radio"/> 0 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 8C <input type="radio"/> 0 <input type="radio"/> 2 <input type="radio"/> 0 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 28	<b>Food Protection</b> 4A <input type="radio"/> 10 <input type="radio"/> 0 <input type="radio"/> 28 4B <input type="radio"/> 10 <input type="radio"/> 0 <input type="radio"/> 28 4C <input type="radio"/> 0 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9 <input type="radio"/> 10 <input type="radio"/> 28 4D <input type="radio"/> 10 <input type="radio"/> 0 <input type="radio"/> 28 4E <input type="radio"/> 0 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9 <input type="radio"/> 10 <input type="radio"/> 28 4F <input type="radio"/> 10 <input type="radio"/> 0 <input type="radio"/> 28 4G <input type="radio"/> 10 <input type="radio"/> 0 <input type="radio"/> 28 4H <input type="radio"/> 10 <input type="radio"/> 0 <input type="radio"/> 28 4I <input type="radio"/> 0 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9 <input type="radio"/> 10 <input type="radio"/> 28 4J <input type="radio"/> 0 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 4K <input type="radio"/> 0 <input type="radio"/> 8 4L <input type="radio"/> 0 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 28 4M <input type="radio"/> 0 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 28 4N <input type="radio"/> 0 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 28 4O <input type="radio"/> 0 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 28 4P <input type="radio"/> 0 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8	<b>Facility Design &amp; 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<b>Other Criticals</b> 7A <input type="radio"/> 10 <input type="radio"/> 28 7B <input type="radio"/> 0 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 28 7C <input type="radio"/> 0 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 28 7D <input type="radio"/> 0 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 28 7E <input type="radio"/> 0 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 28 7F <input type="radio"/> 0 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 28	<b>Food Source-Generals</b> 9A <input type="radio"/> 0 <input type="radio"/> 2 <input type="radio"/> 0 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 9B <input type="radio"/>			

Rev Dec. 2010

Form D



Bureau of Food Safety and Community Sanitation

## SELF-INSPECTION WORKSHEET FOR FOOD SERVICE ESTABLISHMENTS

### PART ONE - SCORED VIOLATIONS

CRITICAL VIOLATIONS	CONDITIONS					SCORE
	I	II	III	IV	V	
FOOD TEMPERATURE						
2A* Food not cooked to required minimum temperature: • Poultry, meat stuffing, stuffed meats > 165°F for 15 seconds • Ground meat and food containing ground meat > 158°F for 15 seconds • Pork, any food containing pork > 155°F for 15 seconds • Rare roast beef, rare beefsteak except per individual customer request > required temperature and time • All other foods except shell eggs per individual customer request > 145°F for 15 seconds	-	-	-	10	28	
2B* Hot food item not held at or above 140°F.	7	8	9	10	28	
2C Hot food item that has been cooked and refrigerated is being held for service without first being reheated to 165°F or above within 2 hours.	5	6	7	8	-	
2D Precooked potentially hazardous food from commercial food processing establishment that is supposed to be heated, but is not heated to 140°F within 2 hours.	5	6	7	8	-	
2E Whole frozen poultry or poultry breasts, other than a single portion, is being cooked frozen or partially thawed.	5	6	-	-	-	
2F Meat, fish or molluscan shellfish served raw or undercooked without prior notification to customer.	-	-	-	8	-	
2G* Cold food item held above 41°F (smoked fish and reduced oxygen packaged foods above 38°F) except during necessary preparation.	7	8	9	10	28	
2H* Food not cooled by an approved method whereby the internal product temperature is reduced from 140° F to 70° F or less within 2 hours, and from 70°F to 41°F or less within 4 additional hours.	7	8	9	10	28	
2I Food prepared from ingredients at ambient temperature not cooled to 41°F or below within 4 hours.	5	6	7	8	-	
2J* Reduced oxygen packaged (ROP) foods not cooled by an approved method whereby the internal food temperature is reduced to 38°F within two hours of cooking and if necessary further cooled to a temperature of 34°F within six hours of reaching 38°F.	7	8	9	10	28	
FOOD SOURCE						
3A* Food from unapproved or unknown source or home canned. Reduced oxygen packaged (ROP) fish not frozen before processing; or ROP foods prepared on premises transported to another site.	-	-	-	10	28	
3B* Shellfish not from approved source, improperly tagged/labeled; tags not retained for 90 days.	-	-	-	10	28	
3C* Eggs found dirty/cracked; liquid, frozen or powdered eggs not pasteurized.	7	8	9	10	28	
3D* Canned food product observed swollen, leaking or rusted, and not segregated from other consumable food items.	7	8	9	10	28	
3E* Potable water supply inadequate. Water or ice not potable or from unapproved source. Cross connection in potable water supply system observed.	-	-	-	10	28	
3F* Unpasteurized milk or milk product present.	-	-	-	10	28	
3G Raw food not properly washed prior to serving.	5	6	7	8	-	
FOOD PROTECTION						
4A Food Protection Certificate not held by supervisor of food operations.	-	-	-	-	10	
4B* Food worker prepares food or handles utensil when ill with a disease transmissible by food, or has exposed infected cut or burn on hand.	-	-	-	10	28	
4C* Food worker does not use proper utensil to eliminate bare hand contact with food that will not receive adequate additional heat treatment.	7	8	9	10	28	
4D* Food worker does not wash hands thoroughly after using the toilet, coughing, sneezing, smoking, eating, preparing raw foods or otherwise contaminating hands.	-	-	-	10	28	
4E* Toxic chemical improperly labeled, stored or used such that food contamination may occur.	7	8	9	10	28	
4F* Food, food preparation area, food storage area, area used by employees or patrons contaminated by sewage or liquid waste.	-	-	-	10	28	
4G* Unprotected potentially hazardous food re-served.	-	-	-	10	28	
4H* Raw, cooked or prepared food is adulterated, contaminated, cross-contaminated or not discarded in accordance with HACCP plan.	7	8	9	10	28	
4I Unprotected food re-served.	5	6	7	8	-	

\* Public Health Hazards (PHH) must be corrected immediately

+ Pre-permit Serious (PPS) Violations that must be corrected before permit is issued



<b>4J</b>	Appropriately scaled metal stem-type thermometer or thermocouple not provided or used to evaluate temperatures of potentially hazardous foods during cooking, cooling, reheating and holding.	-	-	-	8	-	
<b>4K</b>	Evidence of rats or live rats present in facility's food and/or non-food areas.	5	6	7	8	28	
<b>4L</b>	Evidence of mice or live mice present in facility's food and/or non-food areas.	5	6	7	8	28	
<b>4M</b>	Live roaches present in facility's food and/or non-food areas.	5	6	7	8	28	
<b>4N</b>	Filth flies or food/refuse/sewage-associated (FRSA) flies present in facility's food and/or non-food areas. Filth flies include house flies, little house flies, blow flies, bottle flies and flesh flies. Food/refuse/sewage-associated flies include fruit flies, drain flies and Phorid flies.	5	6	7	8	28	
<b>4O</b>	Live animals other than fish in tank or service animal present in facility's food and/or nonfood areas.	5	6	7	8	-	
<b>FACILITY DESIGN</b>							
<b>5A*</b>	Sewage disposal system improper or unapproved.	-	-	-	10	28	
<b>5B*</b>	Harmful, noxious gas or vapor detected. CO > 13 ppm.	-	-	-	10	28	
<b>5C+</b>	Food contact surface improperly constructed or located. Unacceptable material used.	7	8	9	10	28	
<b>5D+</b>	Hand-washing facility not provided in or near food preparation area and toilet room. Hot and cold running water at adequate pressure to enable cleanliness of employees not provided at facility. Soap and an acceptable hand-drying device not provided.	-	-	-	10	28	
<b>5E+</b>	Toilet facility not provided for employees or for patrons when required.	-	-	-	10	28	
<b>5F+</b>	Insufficient or no refrigerated or hot holding equipment to keep potentially hazardous foods at required temperatures.	-	-	-	10	28	
<b>5G+</b>	Properly enclosed service/maintenance area not provided. (Mobile Food Commissary)	-	-	-	10	28	
<b>5H+</b>	No facilities available to wash, rinse and sanitize utensils and/or equipment.	-	-	-	10	28	
<b>5I+</b>	Refrigeration used to implement HACCP plan not equipped with an electronic system that continuously monitors time and temperature.	-	-	-	10	28	
<b>PERSONAL HYGIENE &amp; OTHER FOOD PROTECTION</b>							
<b>6A</b>	Personal cleanliness inadequate. Outer garment soiled with possible contaminant. Effective hair restraint not worn in an area where food is prepared.	5	6	7	8	-	
<b>6B</b>	Tobacco use, eating, or drinking from open container in food preparation, food storage or dishwashing area observed.	5	6	7	8	-	
<b>6C</b>	Food not protected from potential source of contamination during storage, preparation, transportation, display or service.	5	6	7	8	-	
<b>6D</b>	Food contact surface not properly washed, rinsed or sanitized after each use and following any activity when contamination may have occurred.	5	6	7	8	-	
<b>6E</b>	Sanitized equipment or utensil, including in-use food-dispensing utensil, improperly used or stored.	5	6	7	8	-	
<b>6F</b>	Wiping cloths soiled or not stored in sanitizing solution.	5	6	7	8	-	
<b>6G*</b>	HACCP plan not approved or approved HACCP plan not maintained on premises.	-	-	-	10	28	
<b>6H</b>	Records and logs not maintained to demonstrate that HACCP plan has been properly implemented.	-	-	-	-	28	
<b>6I</b>	Food not labeled in accordance with HACCP plan.	-	-	-	10	28	
<b>OTHER CRITICALS</b>							
<b>7A</b>	Duties of an officer of the Department interfered with or obstructed.	-	-	-	-	28	
<b>CRITICAL VIOLATIONS TOTAL:</b>							

GENERAL VIOLATIONS		CONDITIONS					SCORE
		I	II	III	IV	V	
VERMIN / GARBAGE							
8A	Facility not vermin proof. Harborage or conditions conducive to attracting vermin to the premises and/or allowing vermin to exist.	-	-	4	5	-	
8B	Covered garbage receptacle not provided or inadequate, except that garbage receptacle may be uncovered during active use. Garbage storage area not properly constructed or maintained; grinder or compactor dirty.	2	3	4	5	-	
8C	Pesticide use not in accordance with label or applicable laws. Prohibited chemical used/stored. Open bait station used.	2	3	4	5	28	
FOOD SOURCE							
9A	Canned food product observed dented and not segregated from other consumable food items.	2	3	4	5	-	
9B	Thawing procedures improper.	2	3	4	5	-	
9C	Food contact surface not properly maintained.	2	3	4	5	-	

\* Public Health Hazards (PHH) must be corrected immediately

+ Pre-permit Serious (PPS) Violations that must be corrected before permit is issued



FACILITY MAINTENANCE						
10A	Toilet facility not maintained and provided with toilet paper, waste receptacle and self-closing door.	2	3	4	5	-
10B	Plumbing not properly installed or maintained; anti-siphonage or backflow prevention device not provided where required; equipment or floor not properly drained; sewage disposal system in disrepair or not functioning properly.	2	3	4	5	28
10C	Lighting inadequate; permanent lighting not provided in food preparation areas, ware washing areas, and storage rooms.	2	3	4	5	-
10D	Mechanical or natural ventilation system not provided, improperly installed, in disrepair and/or fails to prevent excessive build-up of grease, heat, steam condensation vapors, odors, smoke and fumes.	2	3	4	5	-
10E	Accurate thermometer not provided in refrigerated or hot holding equipment.	2	3	4	5	-
10F	Non-food contact surface improperly constructed. Unacceptable material used. Non-food contact surface or equipment improperly maintained and/or not properly sealed, raised, spaced or movable to allow accessibility for cleaning on all sides, above and underneath the unit.	2	3	4	5	-
10G	Food service operation occurring in room used as living or sleeping quarters.	2	3	4	5	-
10H	Proper sanitization not provided for utensil ware washing operation.	2	3	4	5	-
10I	Single service item reused, improperly stored, dispensed; not used when required.	2	3	4	5	-
10J	"Wash hands" sign not posted at hand-wash facility.	2	-	-	-	-
OTHER GENERALS						
99B	Other general.	2	3	4	5	28
GENERAL VIOLATIONS TOTAL:						
CRITICAL AND GENERAL COMBINED TOTAL:						
PART TWO - UNSCORED VIOLATIONS						

	CONDITION YES	OBSERVED NO
DISTRIBUTION OF TOBACCO PRODUCTS THROUGH VENDING MACHINES		
15A	Tobacco vending machine present where prohibited.	
15B	Tobacco vending machine placed less than 25 feet from entrance to premises.	
15C	Tobacco vending machine not visible to the operator, employee or agent.	
15D	Durable sign with license number, expiration date, address and phone number not posted.	
TOBACCO PRODUCT REGULATION ACT		
15E	Out-of-package sale of tobacco products observed.	
15F	Employee under the age of 18 selling tobacco products without direct supervision of an adult retail dealer or dealer.	
15G	Sale to minor observed.	
15H	Sign prohibiting sale of tobacco products to minors not conspicuously posted.	
SMOKE-FREE AIR ACT		
15I	"No Smoking" and/or "Smoking Permitted" sign not conspicuously posted. Health warning not present on "Smoking Permitted."	
15J	Ashtray present in smoke-free area.	
15K	Operator failed to make good faith effort to inform smokers of the Smoke-Free Air Act prohibition of smoking.	
15L	Smoke free workplace smoking policy inadequate, not posted, not provided to employees.	
15M	Use of tobacco product on school premises (at or below the 12th grade level) observed.	
15N	Smoking permitted and/or allowed in smoking prohibited area under the operator's control.	
SALE OF HERBAL CIGARETTES		
15O	Sale of herbal cigarettes to minors observed.	
TOBACCO HEALTH WARNING AND SMOKING CESSATION SIGN		
15P	No tobacco health warning and smoking cessation sign(s) are posted.	
15Q	Tobacco health warning and smoking cessation sign(s) are obstructed and/or not prominently displayed.	
15R	No large tobacco health warning and smoking cessation sign is posted where tobacco products are displayed; small sign(s) are not posted at each register or place of payment.	

\* Public Health Hazards (PHH) must be corrected immediately

+ Pre-permit Serious (PPS) Violations that must be corrected before permit is issued

	CONDITION YES	OBSERVED NO
<b>RESTRICTION ON THE SALE OF CERTAIN FLAVORED TOBACCO</b>		
<b>15S</b> A flavored tobacco product sold or offered for sale in an establishment other than a tobacco bar.		
<b>15T</b> Original label for tobacco product sold or offered for sale not maintained on site.		
<b>ARTIFICIAL TRANS FAT</b>		
<b>16A</b> A food containing artificial trans fat, with 0.5 grams or more of trans fat per serving, is being stored, distributed, held for service, used in preparation of a menu item, or served.		
<b>16B</b> The original nutritional fact labels and/or ingredient label for a cooking oil, shortening or margarine or food item sold in bulk, or acceptable manufacturer's documentation not maintained on site.		
<b>CALORIE MENU LABELING</b>		
<b>16C</b> Caloric content not posted on menus, menu boards or food tags, in a food service establishment that is 1 of 15 or more outlets operating the same type of business nationally under common ownership or control, or as a franchise or doing business under the same name, for each menu item that is served in portions, the size and content of which are standardized.		
<b>16E</b> Caloric content range (minimum to maximum) not posted on menus and or menu boards for each flavor, variety and size of each menu item that is offered for sale in different flavors, varieties and sizes.		
<b>16F</b> Specific caloric content or range thereof not posted on menus, menu boards or food tags for each menu item offered as a combination meal with multiple options that are listed as single items.		
<b>ADMINISTRATION AND DOCUMENTATION</b>		
<b>18A</b> Current valid permit, registration or other authorization to operate establishment not available.		
<b>18B</b> Document issued by the Board of Health, Commissioner or Department unlawfully reproduced or altered.		
<b>18C</b> Notice of the Department of Board of Health mutilated, obstructed, or removed.		
<b>18D</b> Failure to comply with an Order of the Board of Health, Commissioner, or Department.		
<b>18E</b> Failure to report occurrences of suspected food borne illness to the Department.		
<b>18F</b> Permit not conspicuously displayed.		
<b>18G</b> Manufacture of frozen dessert not authorized on Food Service Establishment permit.		
<b>18H</b> Failure of event sponsor to exclude vendor without a current valid permit or registration.		
<b>SIGNAGE</b>		
<b>20A</b> Food allergy information poster not conspicuously posted where food is being prepared or processed by food workers.		
<b>20B</b> Food allergy information poster not posted in language understood by all food workers.		
<b>20C</b> Food allergy poster does not contain text provided or approved by Department.		
<b>20D</b> "Choking first aid" poster not posted. "Alcohol and pregnancy" warning sign not posted. Resuscitation equipment: exhaled air resuscitation masks (adult & pediatric), latex gloves, sign not posted. Inspection report sign not posted.		
<b>20E</b> Letter Grade or Grade Pending card not conspicuously posted and visible to passersby.		
<b>20F</b> Current letter grade card not posted.		
<b>NUISANCE AND OTHER MISCELLANEOUS</b>		
<b>22A</b> Nuisance created or allowed to exist. Facility not free from unsafe, hazardous, offensive or annoying conditions.		
<b>22B</b> Toilet facility used by women does not have at least one covered garbage receptacle.		
<b>22C</b> Bulb not shielded or shatterproof, in areas where there is extreme heat, temperature changes, or where accidental contact may occur.		
<b>22D</b> ROP Processing equipment not approved by DOHMH.		

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Bureau of Food Safety and Community Sanitation Contact Information

Phone: (212) 676-1600  
Fax: (212) 676-1666  
web: [www.nyc.gov/health](http://www.nyc.gov/health)

**Michael R. Bloomberg**  
Mayor

**Thomas Farley, M.D., M.P.H.**  
Commissioner of Health  
and Mental Hygiene

**Daniel Kass, M.S.P.H.**  
Deputy Commissioner  
Division of Environmental Health

**Robert Edman**  
Assistant Commissioner

**Elliott S. Marcus**  
Associate Commissioner

**Michelle Robinson**  
Deputy Executive Director  
Program Planning and Policy

## A Sample Smoke-Free Workplace Policy

<b>Purpose</b>	A smoke-free policy has been developed to comply with the New York City Smoke-Free Air Act (Title 17, Chapter 5 of the Administrative Code of the City of New York) and New York State Clean Indoor Air Act (Article 13-E of the New York State Public Health Law), and to protect all employees and visitors from secondhand smoke, an established cause of cancer and respiratory disease. The policy set forth below is effective March 30, 2003 for all [company name] locations.
<b>Smoke-Free Areas</b>	All areas of the workplace are now smoke-free without exception. Smoking is not permitted anywhere in the workplace, including all indoor facilities and company vehicles with more than one person present. Smoking is not permitted in private enclosed offices, conference and meeting rooms, cafeterias, lunchrooms, or employee lounges.
<b>Sign Requirements</b>	“No Smoking” signs must be clearly posted at all entrances and on bulletin boards, bathrooms, stairwells and other prominent places. No ashtrays are permitted in any indoor area.
<b>Compliance</b>	<p>Compliance with the smoke-free workplace policy is mandatory for all employees and persons visiting the company, with no exceptions. Employees who violate this policy are subject to disciplinary action.</p> <p>Any disputes involving smoking should be handled through the company’s procedure for resolving other work-related problems. If the problem persists, an employee can speak to [company department and phone number for complaints] or lodge an anonymous complaint by calling the New York City Department of Health and Mental Hygiene’s complaint line, 1-877-NYC DOH7 (1-877-692-3647) or on the web at <a href="http://nyc.gov/health">nyc.gov/health</a>. DOHMH’s enforcement staff will take appropriate action to resolve the problem.</p> <p>The law prohibits employers from retaliating against employees who invoke the law or who request management’s assistance in implementing it in the workplace.</p>
<b>Smoking Cessation Opportunities</b>	[Company name] encourages all smoking employees to quit smoking. [The company medical department or worksite wellness program offers a number of services for employees who want to quit.] Smoking cessation information is available from the New York Smokers’ Quit Line at 1-866 NY QUIT (1-866-697-8487).
<b>Questions</b>	Any questions regarding the smoke-free workplace policy should be directed to [company department and phone number handling inquiries].

*[NOTE: This policy may need to be modified in workplaces and establishments that qualify for exemptions]*

**FOOD PROTECTION COURSE**

# Quiz No. 1

1. Potentially hazardous foods provide conditions favorable for bacterial growth.

☐ **TRUE** or ☐ **FALSE**

2. Shellfish tags must be kept with the product and then filed away for \_\_\_\_\_ days.

3. The acronym "FIFO" means \_\_\_\_\_ in, \_\_\_\_\_ out.  
The first step is: \_\_\_\_\_.

4. To show that it is wholesome, meat inspected by the U.S. Department of Agriculture will have the

☐ **USDA inspection stamp**

☐ **USDA grade stamp**

5. The *temperature danger zone* for food is between \_\_\_\_\_ °F and \_\_\_\_\_ °F.

At this temperature range, harmful bacteria

☐ **reproduce** rapidly  
☐ **die**

6. In a refrigerator, raw food products should be stored

☐ **above** cooked foods  
☐ **below**

This is to prevent \_\_\_\_\_.

7. List three defects which will cause canned foods to be rejected:

\_\_\_\_\_,  
\_\_\_\_\_,  
\_\_\_\_\_.

8. A glass thermometer should never be used for measuring food temperature. What kinds can be used?

9. Fresh shell eggs must be stored in a refrigerator at or below 45° F

☐ **TRUE** or ☐ **FALSE**

10. All food items must be stored at least

☐ **6 inches**  
☐ **8 inches** off the floor  
☐ **12 inches**

11. Cold temperatures slow down the growth of bacteria.

☐ **TRUE** or ☐ **FALSE**

12. People, both food workers and customers, pose the greatest risk to food safety.

☐ **TRUE** or ☐ **FALSE**

**FOOD PROTECTION COURSE**

# Quiz No. 2

1. Under favorable growth conditions, bacteria will double every \_\_\_\_ to \_\_\_\_ minutes.

2. List three situations when hands must be washed thoroughly:

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_

3. All food service establishments must have hand-wash sinks within each \_\_\_\_\_ and each \_\_\_\_\_ and they must be provided with \_\_\_\_\_ and \_\_\_\_\_ running water, soap, and individual disposable towels or a hot air dryer.

4. Employees with an illness that can be transmitted by direct contact with food or through food must be \_\_\_\_\_.

5. Bacteria commonly found on the surface of raw chicken are called:

- ☐ **Salmonella**
- ☐ **Staphylococcus**
- ☐ **B. Cereus**

6. A piece of metal in a food item is an example of a

- ☐ **physical** hazard
- ☐ **chemical**

7. *Clostridium perfringens* is associated with foods in deep pots. We can control it by \_\_\_\_\_ and \_\_\_\_\_ meat dishes rapidly.

8. Home canned foods cannot be used in a food establishment because of the fear of

- ☐ **AIDS** or ☐ **Botulism**

9. Smoked fish must be stored at or below 38°F. This is to control the growth of the microorganism \_\_\_\_\_.

10. The disease \_\_\_\_\_ is commonly associated with undercooked pork. Pork should therefore be cooked to a minimum temperature of \_\_\_\_\_°F.

11. When using raw shell eggs in a food that will not be cooked or will only be cooked lightly, we should use \_\_\_\_\_ eggs instead.

12. Foods contaminated by harmful microorganisms always have a changed appearance.

- ☐ **TRUE** or ☐ **FALSE**



**FOOD PROTECTION COURSE**

# Quiz No. 3

1. The proper safe holding temperature for potentially hazardous foods is at \_\_\_\_\_ or below for cold foods and at \_\_\_\_\_ or above for hot foods.

2. When cooling hot foods in a refrigerator, they must be covered:

- ☐ **after being cooled**  
☐ **when first placed in the refrigerator**

3. Refrigerated foods that will be served hot must be rapidly reheated to 165° F using:

- ☐ **a hot holding unit**  
☐ **a stove or an oven**

4. When bacteria from a raw food get into a cooked or ready-to-eat food, this is called \_\_\_\_\_.

5. The correct cooking temperature for poultry, stuffed meat and stuffing is \_\_\_\_\_°F.

6. Thick foods cool faster in:

- ☐ **small amounts and small containers**  
☐ **large amounts and large containers.**

7. It is good practice to make cold salads with ingredients that were previously chilled?

- ☐ **TRUE** or ☐ **FALSE**

8. On a buffet table, maintaining proper food temperature is equally as important as having a proper sneeze guard.

- ☐ **TRUE** or ☐ **FALSE**

9. An air break is necessary in the waste line of the

- ☐ **potwash and handwash sinks**  
☐ **potwash and culinary sinks**

10. It is a good practice to thaw frozen foods by leaving them out on the kitchen counter overnight.

- ☐ **TRUE** or ☐ **FALSE**

11. When handling foods that have already been cooked and are ready to be eaten we must use \_\_\_\_\_,

\_\_\_\_\_,  
 \_\_\_\_\_.

12. To ensure that any food contact surface is safe to use, it must be washed, rinsed and \_\_\_\_\_,

# Quiz No. 4

1. Self-Assessment of food operations is an excellent way to improve security, safety and general work practice.

☐ **TRUE** or ☐ **FALSE**

2. List three common injuries among restaurant workers.

\_\_\_\_\_,  
\_\_\_\_\_,  
\_\_\_\_\_.

3. What causes muscle strains and sprains among restaurant workers?

6. Store knives in \_\_\_\_\_ to prevent accidental cuts.

7. It is acceptable to use pesticides in food establishments by food workers as long as label directions are followed.

☐ **TRUE** or ☐ **FALSE**

8. The three key strategies of integrated pest management are to starve them, build them out, and destroy them.

☐ **TRUE** or ☐ **FALSE**

9. Trans fat in foods raises HDL, increasing the risk of heart disease.

☐ **TRUE** or ☐ **FALSE**

4. Suitable work shoes are (*check all that apply*):

- ☐ **slip resistant**
- ☐ **leather soled**
- ☐ **canvas sneakers**
- ☐ **flats**

5. Who should be given access to facility food areas? (*check all that apply*):

- ☐ **cooks**
- ☐ **customers**
- ☐ **contractors**

10. List four foods that contain trans fats.

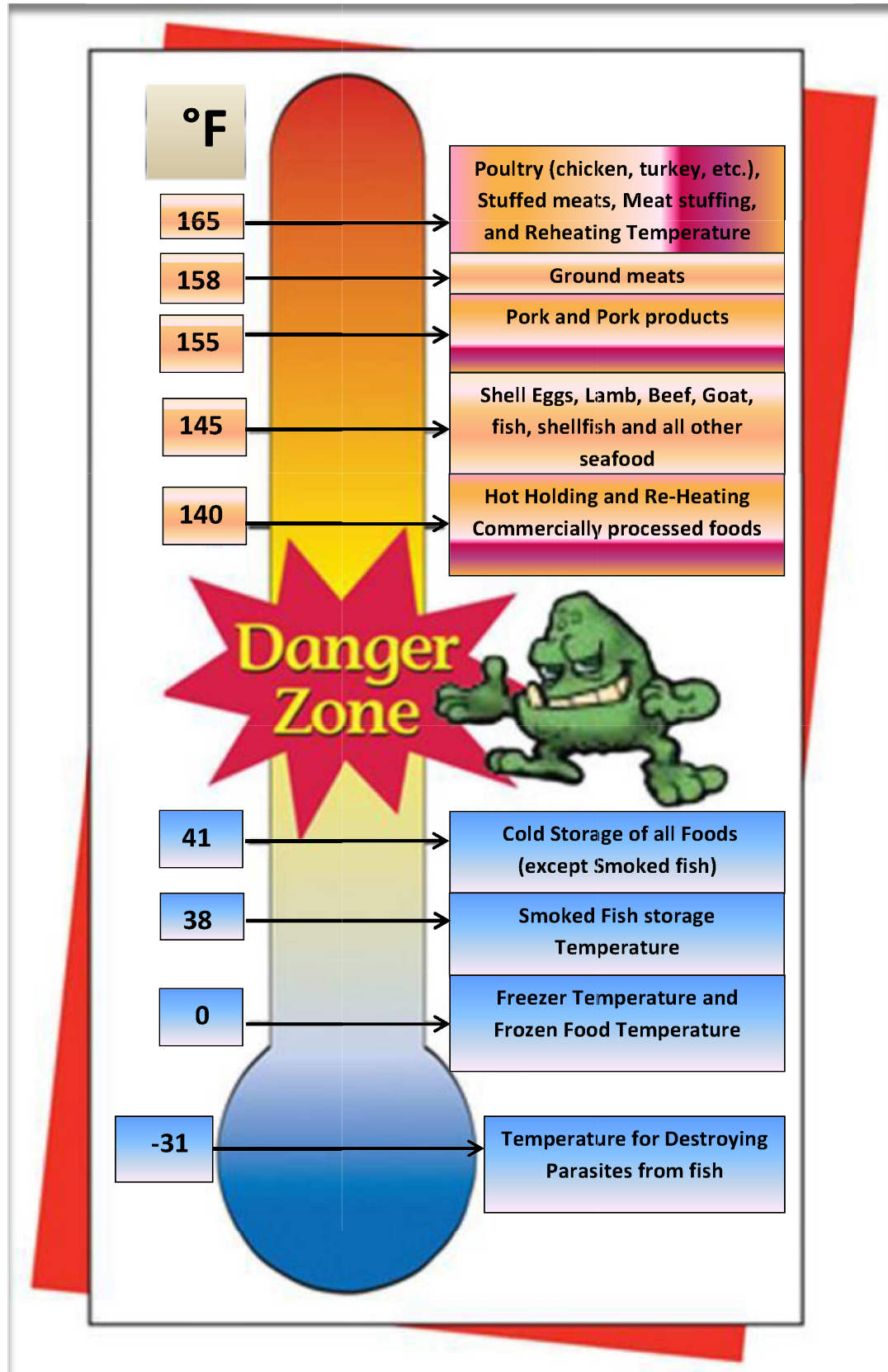
\_\_\_\_\_,  
\_\_\_\_\_,  
\_\_\_\_\_,  
\_\_\_\_\_.

FOOD PROTECTION COURSE

# Numbers to remember

158°F _____	145°F _____
41°F _____	155°F _____
41°F–140°F _____	130°F for 121 minutes _____
0°F _____	4 hours _____
0°F–220°F _____	6 lbs. _____
38°F _____	more than 19 seats _____
6 inches _____	4 inches _____
90 days _____	170°F for 30 sec. _____
140°F _____	50 ppm _____
165°F _____	1 oz./1gal. _____
20–30 minutes _____	-31°F/15 Hours _____

*Minimum Internal Cooking, Reheating and Storage Temperatures*





## Health Department Amends Temperature Control Requirements Monitor Food by Using Time as a Public Health Control

Food establishments can now hold potentially hazardous foods without temperature control for four to six hours if they meet certain time limits and other guidelines. Using time only to monitor food, instead of time and temperature, is called Time as a Public Health Control. Before this Health Code change, potentially hazardous hot foods had to be maintained at a minimum hot temperature, and cold foods at a maximum cold temperature at all times.

### Which foods can be monitored by time alone?

All potentially hazardous foods can be monitored by time alone, **EXCEPT**:

- Smoked and vacuum-packed foods.
- Raw eggs awaiting preparation at senior centers, assisted living and health care facilities, day care programs and schools.

Once time is used as the control, food cannot be returned to hot or cold holding again to be saved and used at a later time. It must be discarded at the end of the time allowed.

### Which food service establishments can use time alone as the public health control?

All food establishments can now monitor food safety by time alone instead of time and temperature, **EXCEPT**:

- Mobile food vending units
- Self-service salad bars and buffets
- Temporary food service establishments (for example, street fair or flea market vendors)
- Food vending machines

### At what temperature should hot or cold food be when I start monitoring it?

When you remove it from temperature control:

- Hot food must be at 140° F (60° C) or higher.
- Cold food must be at 41° F (5° C) or lower.

### How long can I keep food from hot or cold holding?

- Food must be labeled, whether it is hot or cold.
- You can keep hot or cold food without temperature control for up to four hours.
- You can keep cold food without temperature control for up to six hours, if you follow additional temperature-tracking procedures.



### How do I track food by time?

- As soon as you remove a food item from hot or cold temperature holding, you must record the following information on the food's container, the food item or its tray:
- Temperature of the food item when removed from hot or cold holding
- Time food item was removed from hot or cold holding
- Time food item will be discarded four hours later

Labels may be hand-written, but must be clear. The Health Department suggests that food service establishments provide pre-printed labels like the samples below and have food workers fill in the appropriate information.

#### Sample Tracking Label: Four-Hour Time Limit for Hot and Cold Food

<p><b>Date:</b> January 1, 2012  <b>Food item:</b> Peking Duck  <b>Holding temperature of food item:</b> 155° F  <b>Time removed:</b> 11:30 AM  <b>Discard time:</b> 3:30 PM</p>
--

### What foods can I hold out of temperature longer than four hours?

You can keep **COLD** food without temperature control for up to six hours if you record the following information on the food's container, the food item or its tray:

- Temperature of the food item when removed from cold holding
- Time it was removed from cold holding
- Time it will be discarded six hours later
- Temperature of the food at the four-hour time limit and write the temperature and the time you took it on the label or container.

**You must immediately throw away food if its temperature is 70° F (21° C) or higher at the four-hour time limit.**

#### Sample Tracking Label: Six-Hour Time Limit for Cold Food Only

<p><b>Date:</b> January 1, 2012  <b>Food item:</b> Sushi rice and raw fish  <b>Holding temperature of food item:</b> 38° F  <b>Time removed:</b> 11:30AM  <b>Temperature at four hours:</b> 59° F at 3:30 PM  <b>Discard time:</b> 5:30 PM</p>
--

### What should I do with food not served within the four- or six-hour time limit?

You must throw away:

- Hot food not served after four hours
- Cold food not served after six hours, or after four hours if its temperature is 70° F (21° C) or higher

### Do I have to save the tracking labels or marked containers after food is served or thrown away?

No. You do not have to save labels or marked containers after serving or throwing away food.

### Can I get a notice of violation or fine for failing to comply with this rule?

Yes. If you don't properly label food or discard food you're monitoring by time, a health inspector can issue a notice of violation for food out of temperature or a violation for adulterated food, and the hearing examiner at the Administrative Tribunal may issue fines of \$200 to \$2,000 for each violation.

## TAKING TEMPERATURES

Use a bi-metallic stem thermometer, digital thermometer (thermistor) or thermocouple unit to monitor temperatures of potentially hazardous foods.

Clean and sanitize the thermometer probe with a single-use alcohol wipe or other approved sanitizer.

Insert the probe into the center, or thickest part of the food; between the folds of flexible packaged products, or between packages of food. Do not puncture the packaging!

- i. Bi-metallic stem thermometer must be inserted in the food up to the dimple in the stem.
- ii. For thermistor thermometers, 3/4 inch of the stem must be in the food.
- iii. Thermocouple registers temperature at the tip of the probe.

**Step 3.** Wait for the reading to register

- 15–20 seconds for bi-metallic stem thermometer and digital readout
- Few seconds for thermocouple

**Step 4.** Sanitize and store thermometers safely for future use

## RECEIVING

### **Receiving Potentially Hazardous Foods (PHF):**

- Inspect the delivery truck for proper temperatures, cleanliness and hygienic practices.
- Make sure by that all PHFs are delivered at proper temperatures: 41° F for cold food (except smoked fish at 38° F and raw shell eggs at 45° F); 0° F or below for frozen foods; 140° F or higher for hot food.
- Make sure all frozen foods are frozen solid at 0° F or below.
- When receiving shellfish, ensure that proper tags are provided.

### **Receiving dry foods, produce and packaged foods:**

- Ensure that all packages are intact and free of damage.
- Check for rodent gnawing and/or presence of insects or insect eggs.
- Ensure that products are delivered long before their "Sell by" or "Use by" date.
- Look out for any dented, leaking, rusted or swollen cans.
- Ensure that fruits and vegetables are not bruised, wilted or spoiled.

## STORAGE

- Implement First In - First Out (FIFO) practices by dating the food products as they are received. This enables easier stock rotation while minimizing food waste.
- All food areas must be constructed away from overhead waste or condensation lines.
- All food must be stored at least six inches above the floor, so that proper cleaning can take place. Foods must also be stored away from the walls and ceilings to allow for proper air circulation.

### **Dry Storage:**

- Humidity of 50% and a temperature of 70° F are strongly recommended.
- Look out for signs of vermin activity, such as rat or mouse droppings, vermin eggs or odors.
- Store food in vermin-proof containers — metal or glass containers, with tightly fitted lids.
- Remove dented, leaking, rusted, swollen or unlabeled canned goods.

### **Cold Storage:**

- All PHFs must be stored at 41° F (Except smoked fish at 38° F and raw shell eggs at 45 ° F).
- All cooked and ready-to-eat food must be stored away from and above raw food.
- Do not store foods in quantities that exceed the storage unit's capacity.
- Place a refrigeration thermometer in the warmest spot in the unit to measure ambient air temperature of the unit
- Check for condensation that may contaminate food.
- Keep frozen foods frozen at 0° F or lower.

## COOKING

### **Cooking Temperatures:**

Cook food to the following **minimum internal temperatures:**

- **Poultry, stuffed meats, stuffing** **165° F**
- **Ground meats** **158° F**
- **Pork and Pork Products** **155° F**
- **Shell eggs** **145° F**
- **All other meats (lamb, fish, shellfish etc.)** **145° F**

### **Important things to remember:**

- When checking internal product temperature, measure at various locations, especially the thickest part (e.g., the meats around the thigh bones).
- Always use clean and sanitary thermometers to check temperatures.
- Properly maintain cooking equipment (ovens, stoves, grills, salamanders, etc.).
- Keep equipment clean and perform regular checks to ensure satisfactory performance.



## COOLING

Step 1: Cool foods from 140°F to 70°F within two hours.

Step 2: Cool foods from 70°F to 140°F within four additional hours.

### **Recommended Cooling Methods:**

#### Meat roasts, Poultry and Fish

- Reduce the size. Cut into 6 lbs. or less portions.

#### Liquid foods – Soups, gravies, curries, sauces, etc.

- Use a 4 inch shallow pan with the product depth of no more than 2 inches.
- Place the pan in the refrigerator uncovered (best place is where the cold air can blow across it).
- Stirring helps release the trapped heat.
- Use thermometer to check the temperature and cover after it has been cooled.

#### Ice Water Bath

- Place the pot of food in a larger container or a culinary sink with water and ice (a 50/50 ice to water ratio would be best).
- Use ice paddles to cool food from within; use it to stir the food.

#### Ice as an Ingredient

- Prepare food with half the amount of water the recipe requires and use the other half in the form of ice to be added during the cooling process.

## PROPER THAWING (DEFROST)

### Acceptable methods to thaw frozen foods:

- There are four acceptable ways to thaw frozen food:
  1. In a **refrigeration unit** at 41° F or lower;
  2. Under **cold** (70° F or lower) running water;
  3. In a **microwave oven**, when it is followed by a continuous cooking process;
  4. As part of a cooking process (for **single portions**).

### Things to remember:

- Never re-freeze thawed food.
- Never thaw frozen food at room temperature.
- Thaw raw food below cooked food to avoid cross-contamination.

## CROSS-CONTAMINATION

### **What is cross contamination?**

This is a term typically used for any situation where harmful microorganisms transfer from a raw or contaminated food to a cooked or ready-to-eat food.

### **Cutting boards and prep tables:**

- Wash, rinse, and sanitize when changing from raw to ready-to-eat (RTE) food, and in between preparing different types of raw meat, fish, and poultry.

### **Hands:**

- When handling ready-to-eat (RTE) food, prevent bare hands contact with the use of gloves, tongs, spatula, deli paper, spoon, fork, etc.
- Wash hands thoroughly and often and always between tasks.

### **Food Storage:**

- Store raw meat, fish, and poultry below ready-to-eat (RTE).
- Store raw meats in the following order from top to bottom:
  - i. Poultry
  - ii. Ground meats
  - iii. Pork
  - iv. All other meats

*It's best to keep all seafood separate from other meats.*
- Keep food that does not require further washing or cooking separate from food that does.

## PROPER USE OF GLOVES

**The use of gloves is never a replacement for good hand washing practices!**

*Before putting on gloves:*

- Wash hands thoroughly.
- Dry hands using a disposable paper towel.
- Put gloves on when you are ready to handle ready-to-eat (RTE) foods.
- Use gloves for only **one task**, and then discard.
- If an interruption occurs during food preparation, remove gloves and discard.
- Use clean gloves when you resume food preparation, but remember to wash hands first.
- Gloves are prone to contamination and should be discarded when soiled or damaged.
- Fabric or re-usable gloves may not be used with ready-to-eat (RTE) food.

## HOT HOLDING FOODS

- Keep all foods at 140°F or higher.
- Preheat equipment before adding food.
- Check food temperatures with an accurate food thermometer.
- Record temperatures.
- Stir frequently to evenly distribute the temperature throughout the food.



## CLEANING AND SANITIZING

### Manual dishwashing:

- The dishwashing area must be located a sufficient distance away from food preparation areas to avoid possible cross-contamination.
- Manual dishwashing is allowed only in a three-compartment sink: Wash in the first; Rinse in the second; Sanitize in the third; then air dry.
- For heat sanitizing, water temperature in the third compartment must be at least 170° F or higher, and the dishes must be immersed for at least 30 seconds. The temperature must be maintained by a heating element.
- For chemical sanitizing, the chlorine-based sanitizer in the third compartment must be at least 50 parts per million (ppm), and the dishes must be immersed in the sanitizing solution for at least 60 seconds. ***To make 50 ppm sanitizing solution, take ½-ounce (or one tablespoon) of household bleach and mix it with one gallon of water.***
- Appropriate test kit must be used to test the strength of sanitizers used.

### Mechanical dishwashing:

- All mechanical dishwashers, both high temperature and low-temperature must be operated as per manufacturer suggestions.

*Final rinse temperature of mechanical high-temperature dishwasher must be at least 180° F or higher.*

- Properly calibrated dishwasher-safe thermometers must be used to verify final rinse temperatures.
- Appropriate test kit must be used to verify proper chemical concentrations.

## PEST CONTROL

- Premises, equipment, and fixtures must be constructed and designed to be vermin proof.
- All food must be stored in vermin-proof containers with tightly fitted lids.
- Establishment must be free of all holes, cracks, and crevices.
- A licensed exterminator must perform any extermination done on the premises.
- Eliminate all holes, cracks, and crevices in food storage, preparation, and handling areas.
- Make all parts of food storage, preparation, and handling areas easily accessible for routine cleaning.
- Ensure that all doors and windows are tight fitting, with metal kick plates wherever necessary.
- Ensure that screens are provided on all windows and doors that can be opened.
- Food storage, preparation, and handling areas should be vermin proof. Be aware that mice can enter openings less than ¼-inch in diameter, and rats can enter openings less than ½-inch in diameter.
- Clean up all debris and trash. Remove food waste and other garbage frequently.
- Place the garbage in metal containers with tight fitted lids.
- Keep outside areas of the FSE clean to discourage pests. Maintain proper drainage to reduce or eliminate shelter areas for pests.
- To reduce pest and vermin harborage, control weeds under fences and other barriers with herbicides labeled for this purpose.
- Place outdoor lighting fixtures away from entrances and windows to the FSE to minimize the presence of flying insects that are attracted to light.

## TEMPERATURE LOG

#

[illegible]

#

## NOTICE

It is an unfortunate reality that your place of business may one day be visited by unscrupulous individuals pretending to be employees of the Department of Health and attempting to obtain money from you with the promises of service that may include removing outstanding violations from your record, obtaining a permit, renewing an expired permit, clearing outstanding fines or penalties from your record, or delaying future inspections. The Department is also concerned by the actions of some operators who may try to prevent the Department's personnel from performing their duties.

For your own benefit and to minimize conflicts and misunderstandings with the Department of Health and Mental Hygiene you need to be aware of the following:

1. Individual owners, partners of a partnership, and officers and directors of a corporation, to which a Department of Health and Mental Hygiene permit is issued, must comply with the requirements of the Health Code and are jointly and severally liable for violations of the conditions of the permit or the Health Code that are committed in the regular course of their business or on the premises subject to the permit, or in the course of using your permit.
2. The Department of Health and Mental Hygiene may inspect any premises, record, matter or thing within its jurisdiction, including but not limited to any premises whose activity is regulated by the New York City Health Code or other laws which the Department has the responsibility to enforce.
3. Public Health Sanitarians (Health Inspectors) while in the performance of their duties are official representatives of the New York City Department of Health and peace officers. They are permitted access for purposes of inspection at all times while your food service establishment is in operation, whether or not it is open to the public.
4. Health Inspectors carry photo identification and a metal shield. You have every right to demand to see both items and deny access to your premises if they are not produced.
5. Upon request inspectors must provide you with the telephone number and address of their field office. You may call and confirm that the individual is an employee of the Department and is in fact at your establishment to conduct official business.
6. Refusal of admittance, the directing of verbal abuse towards, interference with or any physical obstruction of an inspector after proper identification is shown, is cause for action by the Commissioner to suspend or revoke your permit and to order your establishment closed.
7. **Health Inspectors are *not* authorized to collect money on behalf of the Department or Board of Health. Any attempt to obtain money from you may represent a criminal offense and should be immediately reported to your local police precinct or the Office of the Inspector General for the Department of Health and Mental Hygiene at (212) 825-2141.**