

Food Handler Certification Study Guide

Halton Region Health Department



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Legislation and Inspection

There are three levels of Government involved in Food Safety in Canada: Federal, Provincial and Regional/Municipal.

Federal Level

The Canadian Food Inspection Agency (CFIA) is the federal agency that is responsible for enforcing Health Canada standards for safety and nutritional quality of food sold in Canada. Their area of responsibility includes, but is not limited to:

- Inspection of food manufacturing plants in which food being produced is shipped across provincial and international borders.
- Inspection of federally registered meat processing plants.
- Govern all the regulations with regards to food labelling and ingredient listings.
- Issue food recalls and allergy alerts.

Provincial Level

The Ministry of Health and Long Term Care – Public Health Division is the provincial agency that develops and publishes regulations, standards and policies concerning food safety in the province of Ontario.

Health Protection and Promotion Act

The *Health Protection and Promotion Act, R.S.O. 1990, Ch.7 (HPPA)* is the main piece of legislation designed to protect the health of the public in Ontario. There are a number of regulations under this Act, including the *Food Premises Regulation, R.R.O. 1990, Regulation 562*, and *Small Drinking Water Regulations, 319/08*.

The HPPA empowers the local public health department to enforce the legislation by inspecting places where a health hazard may exist. It also requires anyone who intends to operate a food premise to notify the Public Health Department prior to operation.

Food Premises Regulation

The Food Premises Regulation contains minimum standards that must be followed in any place where food or milk is manufactured, processed, prepared, stored, handled, displayed, distributed, transported, sold or offered for sale. The regulation covers areas such as maintenance, equipment, food temperatures, washrooms, food handling and employee hygiene.

Small Drinking Water Systems (SDWS)

If your business or premises makes drinking water available to the public and you do not get your drinking water from a municipal drinking water system, you may be an owner or operator of a small drinking water system. If you are not sure whether your system is affected, contact the Halton Region Health Department or your local public health unit.

Smoke-Free Ontario Act (SFOA)

Prohibits smoking in any food premise.

Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA)

OMAFRA is the regulatory agency responsible for inspecting premises in Ontario that produce meat, milk, eggs, fruits and vegetables.

Regional/Municipal Level

By-laws are regional or municipal laws that are designed to deal with local issues.

Halton Region— Dinewise (By-law No. 90-09)

Dinewise is a Halton Region by-law regulating disclosure of food safety inspection reports to the public.

- Operator of a food premises must post the Certificate of Inspection at or near the public entrance in a conspicuous place clearly visible to members of the public.
- Operator of a food premises shall ensure that all Food Safety Summary Inspection Reports issued over the past 12 months are available to members of the public to review during operating hours.

Halton Region Health Department

Certificate of Inspection

This establishment is inspected regularly by the Halton Region Health Department

Ask the manager if you would like to see the summary inspection reports for the past twelve months.

For more information about the Food Safety Program, please contact:

Halton Region
Dial 311 or 905-825-6000
Toll free: 1-866-4HALTON (1-866-442-5866)
TTY: 905-827-9833
www.halton.ca



Food Safety - Summary Inspection Report

Establishment name: _____

Establishment address: _____

Certified Food Handler on-site: Yes No

Compliance Inspection
 Re-Inspection

Areas of Assessment	Description	Satisfactory	Corrected at time of Inspection	Date for Re-inspection
Food Protected from Contamination	Foods are adequately protected from contamination during handling and storage.	yes <input type="checkbox"/> no <input type="checkbox"/>	yes <input type="checkbox"/> no <input type="checkbox"/>	
Food Handler Hygiene	Food handler hygiene and hand washing is properly followed.	yes <input type="checkbox"/> no <input type="checkbox"/>	yes <input type="checkbox"/> no <input type="checkbox"/>	
Temperature & Food Storage	Foods are cooked, cooled and stored at proper temperatures.	yes <input type="checkbox"/> no <input type="checkbox"/>	yes <input type="checkbox"/> no <input type="checkbox"/>	
Garbage & Waste Handling	Garbage and/or waste is properly stored and removed.	yes <input type="checkbox"/> no <input type="checkbox"/>	yes <input type="checkbox"/> no <input type="checkbox"/>	
Pest Control	Pest control practices are properly maintained.	yes <input type="checkbox"/> no <input type="checkbox"/>	yes <input type="checkbox"/> no <input type="checkbox"/>	
Equipment & Utensil Sanitation & Storage	Equipment and utensils are properly cleaned, sanitized and maintained.	yes <input type="checkbox"/> no <input type="checkbox"/>	yes <input type="checkbox"/> no <input type="checkbox"/>	
Premise Maintenance & Sanitation	Food premise is properly maintained in a clean and sanitary condition.	yes <input type="checkbox"/> no <input type="checkbox"/>	yes <input type="checkbox"/> no <input type="checkbox"/>	

Date of Inspection: _____ Public Health Inspector: _____

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HS-0102

Food premises that are exempt from the Dinewise by-law include community special events, farmer's markets, hot dog carts or any other type of temporary or itinerant food premises.

Role of the Local Health Department

1. Public Health Inspectors (PHI) inspect food premises to make sure food is safe to eat.

The main purpose of the Food Safety Program is to make sure the food supply eaten by the public is safe. They ensure this through the inspection of food premises and having the operator of the premises correct any problems.

2. Inspectors enforce the Food Premises Regulation.

Public Health Inspectors are required by the legislation to enforce the Food Premises Regulation and prosecute any food premises that are not complying with the accepted standards. They can issue orders, tickets and summons to court to obtain compliance. Other disciplinary action that could be taken includes seizure of foods, destruction of foods and closure of premise.

3. Inspectors educate food handlers on safe food handling methods.

PHIs educate food handlers on safe food handling methods by making them aware of proper food handling techniques.

4. Inspectors help to develop a food safety program with operators to make sure food is safe and wholesome.

A food safety program contains all the aspects of food safety including inspection and education and ties them together. A food safety program empowers the operator to regulate themselves in ensuring the food is safe to eat.

Risk analysis of premises to determine frequency of inspection

- The Health Department inspects all food premises at least once a year.
- Food premises are ranked as high, moderate, or low risk.
- The ranking of the food premise (restaurant, vending truck, grocery store etc.) determines how many times it will be inspected in a year.

A) High Risk (Minimum of three inspections per year)

Premises which prepare hazardous foods and meet at least one of the following criteria:

- Use processes involving many preparation steps and foods frequently implicated as the cause of foodborne illness i.e. full menu restaurants, large banquet facilities, and large catering operations.
- Preparation of foods that involve multiple preparation steps i.e. defrosting, cooking, cooling, storing, reheating, preparing, hot holding, slicing, de-boning, mixing, and serving.
- Establishments with a history of non-compliance and/or associated in the past with a foodborne illness.

B) Moderate Risk (Minimum of two inspections per year)

Premises which meet one of the following criteria:

- Prepare hazardous foods without meeting the criteria outlined in A above.
- Prepare non-hazardous foods with extensive handling and/or high volume of patrons, i.e., bakeries.

C) Low Risk (Minimum of one inspection per year)

Prepare and/or serve non-hazardous foods without meeting the criteria outlined in B above.

- Serve pre-packaged hazardous foods.

- Use a food storage facility for non-hazardous foods only.
- Have public health concerns that relate primarily to sanitation and maintenance.

Review Questions: *Legislation and Inspection*

1. What legislation governs food premises in Ontario?

- a) Canadian Food and Restaurant Association
- b) Association Sanitation Code
- c) Food Premises Regulation
- d) Health Protection and Promotion Act

2. A major role of the Public Health Inspector is to:

- a) Conduct compliance inspections of all food service facilities
- b) Prevent foodborne illness from food service facilities
- c) Educate and consult with food service personnel
- d) All of the above

3. The employers' responsibility with regards to the Halton Dinewise by-law is:

- a) Ensure Dinewise plaque is displayed where customers/clients can see it
- b) Ensure front line staff know where the Summary Inspection Report binder is located
- c) Present Summary Inspection report binder when requested
- d) All of the above



Understanding Foodborne Illness (Food Poisoning)

What is Foodborne Illness?

Foodborne Illness is a disease acquired from eating or drinking contaminated food or water.

- Foodborne illness is a term that can include any type of illness that you can get from eating food that is contaminated. It can include illness from bacteria, viruses, parasites, chemicals, allergies or naturally occurring poisons (ie. those contained in some mushrooms).
- Symptoms can include stomach cramps, fever, headache, nausea, vomiting or diarrhea.
- Symptoms can be almost anything; however, vomiting and diarrhea are most common.
- Onset of symptoms usually occurs between one hour and five days after eating the contaminated food.
- In severe cases, vomiting can occur almost immediately. The length of time it takes for the symptoms to begin will depend on the type of organism which causes the illness, the immune system of the person and the amount of organism the person ate.

Costs of Foodborne Illness

Health care costs for people who get sick.

Health Canada estimates that the annual cost related to foodborne illnesses and related deaths, is between 12 and 14 billion dollars.

Possible law suits from customers who are ill.

There have been numerous cases where restaurants have been sued for causing a foodborne illness. The courts can award any amount of money, usually dependant on the type of illness and the severity.

Bad publicity will result in loss of customers.

Word of mouth spreads very quickly and a restaurant can get a bad reputation, sometimes undeservedly. In the past, restaurants have had to put out full page advertisements to tell customers that the reports are untrue or to apologize for a foodborne illness.

Employees will not be at work resulting in lost wages and shortage of staff.

Since employees eat at the restaurant for many of their meals, they may also get foodborne illness. They will not be able to show up for work because they are ill, or if they are showing symptoms, will be ordered to stay at home by the Health Department. This will result in a shortage of staff for some shifts which will cause bad service and therefore, a potential loss of customers.

Foodborne illness investigations are time consuming and expensive.

The local Health Department will conduct their investigation when a food poisoning occurs. This will be time consuming as the food item will be thoroughly analyzed and the operator will have to deal with many people until it is resolved.

Fines issued through courts from Public Health Inspector reports.

Fines may be levied against the premises and the operator if it is found that they were neglectful in their duties.

Commonly Used Words

Micro-organisms: Invisible living single cells

Pathogen: Harmful micro-organisms that can cause disease in humans.

Hazardous Food: Food that is able to support the growth of pathogenic micro-organisms or the production of toxins. Hazardous food include poultry, ground meats and dairy products.

Clean/Wash: To remove oil, grease, dirt and debris using soap and water.

Sanitize: To destroy unwanted contaminants such as bacteria and viruses using a chemical substance to kill 999 out of 1000 pathogenic micro-organisms.

Cross-contamination: Cross-contamination occurs when safe to eat food comes into contact with pathogenic bacteria, chemicals or unwanted items making the food unsafe to eat.

Ready-to-eat Foods: Food items that can be eaten as is. These include all cooked and heat processed food even if they have been cooled or frozen. Examples include washed vegetables, pre-cooked meats, salads, and cooked pies.

Toxic: Substances that are harmful and poisonous if ingested.

Danger Zone: The temperature zone where bacteria multiply is called the Danger Zone. This temperature range is between 4°C and 60°C (40°F and 140°F).

HACCP (Hazard Analysis Critical Control Points): A system used throughout the food industry to enhance food safety. The system looks at hazardous food, identifies the greatest risk factors, makes the necessary changes to reduce or eliminate the risk and monitors the overall food handling.

Understanding Micro-organisms

Bacteria, parasites, viruses, moulds and yeasts are types of micro-organisms. These five organisms are the most common micro-organisms and the most important in terms of food safety.

Pathogenic bacteria are odourless, tasteless and cause disease. These micro-organisms are dangerous because it is difficult to know if they are present in food.

Spoilage organisms cause odours and off tastes in food. If you eat them, you may or may not become ill. However, most people will not eat spoiled food as they can smell or see the food is not good to eat.

Some micro-organisms are beneficial to humans such as the ones used to make yogurt and cheese. Micro-organisms can be introduced to food from man, pests, other food and food contact surfaces.

How Bacteria Grow

- Bacteria reproduce by dividing itself.
- Bacteria are single celled organisms that reproduce through multiplication. One cell becomes two, two cells become four, four cells become eight and so on. It will divide when the conditions of its surroundings are ideal.
- Bacteria will begin to grow and multiply if they are comfortable in their surroundings. Our goal is not to allow bacteria to become comfortable.
- Bacteria can reproduce every 20 minutes in perfect conditions.
- Bacteria will double its number every 20 minutes if its surroundings are perfect. The number of bacteria will reach dangerous levels in a short period of time in this case.
- Some bacteria can go into a spore state where the bacteria will not grow but will remain alive.
- If spore forming bacteria are exposed to very hot or very cold temperatures, they can protect themselves by changing into a spore state. This protects the bacteria from being killed. The bacteria will begin to grow again when the food goes back into the Danger Zone.

What Pathogenic Bacteria Need to Grow

Bacteria need a combination of things to grow:

1. Temperature

Pathogenic bacteria grow best in the temperature range between 4°C and 60°C (40°F and 140°F). Temperatures below 4°C (40°F) will not kill pathogenic bacteria but will not allow them to multiply enough times to cause an illness. Temperatures between 60°C – 74°C (140°F - 165°F) may not kill pathogenic bacteria but will not allow them to grow. Temperatures above 74°C (165°F) will kill most pathogenic bacteria. This is the easiest factor in controlling pathogenic bacterial growth.

2. Protein

Pathogenic bacteria grow best when there is a rich food supply. Pathogenic bacteria and spoilage bacteria grow most quickly in high protein food such as poultry and seafood. It is difficult to control pathogenic bacterial growth in high protein food.

3. Available Water

Pathogenic bacteria need a water supply to survive. The amount of water in food can be reduced by smoking, drying or adding salt, pectin or sugar. Lower water will not kill pathogenic bacteria but it will not allow them to grow.

4. pH

pH is the measure of the level of acid and can range from 0 to 14. Pathogenic bacteria need a neutral environment to survive. High or low pH will not kill pathogenic bacteria but will not allow them to grow. Tap water has a pH of 7 (neutral), javex has a pH of 13 (alkaline) and vinegar has a pH of 3 (acidic).

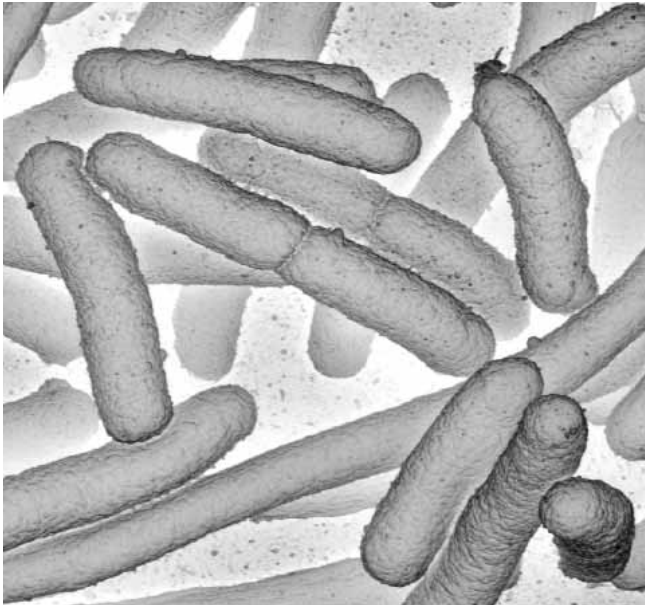
5. Oxygen

Some pathogenic bacteria can only grow where there is oxygen while other pathogenic bacteria can only grow where there is no oxygen, such as in canned and jarred products.

6. Time

Leaving food out at room temperature for more than two hours might be long enough for the pathogens to multiply and cause foodborne illness.

These six things together will allow pathogenic bacteria to multiply enough times to cause a foodborne illness. By changing or eliminating one of the criteria, bacterial growth can be prevented or delayed.



Types of Foodborne Illness

There are four types of Foodborne Illness:

1. Microbiological
2. Chemical
3. Allergic Reactions
4. Physical Contaminants

1. Microbiological

Microbiological Foodborne illness can be caused by:

- Bacteria
- Parasites
- Viruses

Bacteria

The most commonly reported micro-organisms that cause food poisonings are bacteria.

Most bacterial food poisonings last for a few days and clear up on their own. Antibiotics can be prescribed and are effective against bacteria. They will help your immune system fight and eventually destroy the bacteria.

There are two types of bacterial foodborne illness:

A. Bacterial Infection

- Food poisoning infection can occur when the food eaten is contaminated with living pathogenic bacteria.
- You must eat the living bacteria to become ill. Food can contain a large or small amount of bacteria to cause illness, depending on the type of bacteria. The amount and type of bacteria will determine the time for symptoms to appear.
- Bacteria will multiply in the digestive tract and most often cause diarrhea, stomach cramps and fever.
- The bacteria will pass through your stomach and down into your lower intestine. The bacteria will embed themselves in the wall of the intestine and begin to multiply. When there are enough bacteria, diarrhea will result, which can sometimes be bloody.

Examples of infectious bacteria are *Salmonella*, *Campylobacter*, *E. coli* and *Shigella*.

These are the most common however there are many other types as well. There are over 2,000 types of *Salmonella* alone.

B. Bacterial Intoxication

- Food poisoning intoxication can occur when the food eaten is contaminated with toxins (poison) or toxin producing bacteria.
- The bacteria multiply in the food and a by-product of this multiplication is a toxin. The toxin is the poison that causes the illness. The toxin producing bacteria can multiply in the food or in the body and not all toxins are destroyed by cooking.

Examples of Bacterial Infections and Intoxications

Infection: Salmonella

Source:

Intestinal tract and feces of humans and animals, in particular poultry and beef.

Food:

Meat and meat products such as roast beef, meat pies, sausage, ham, poultry, poultry products, milk and eggs (especially cracked eggs).

The Disease:

Symptoms occur six to 72 hours after eating, usually 12 to 36 hours (diarrhea, stomach cramps and vomiting are the usual symptoms).

Prevention:

Proper handling, processing, storage and preparation of food.

Infection: E.coli

Infection: *E.coli* 0157:H7 bacteria are the most harmful strain of *E. coli* bacteria known.

The very young and very old are the most likely to be affected by severe complications such as kidney failure and even death.

Source:

Intestinal tract and feces in humans and animals, in particular, cattle.

Foods:

Raw meats such as ground beef, poultry and pork, unpasteurized milk, and contaminated water.

The Disease:

Symptoms occur three to 10 days after eating or drinking, usually three to four days (bloody or watery diarrhea, abdominal cramps) 0157:H7 infections may develop hemolytic uremic syndrome, with possible permanent kidney damage, even death.

Prevention:

- Cooking food thoroughly
- Proper hand washing using soap and water
- Drinking only pasteurized milk
- Drinking water from a safe water supply

Intoxication:

Staphylococcus aureus

Source:

Found on or in the nose, throat, hair, skin, hands and feces of humans and animals.

Food:

Ham, beef, pork, poultry, potato salad, custard, cream sauces, puddings and fermented dairy products.

The Disease:

Symptoms occur 30 minutes to 8 hours after eating, usually two to four hours (vomiting, stomach cramps and diarrhea are the usual symptoms).

Prevention:

- Cook food thoroughly and do not allow toxins to form
- Practice good personal hygiene including properly washing hands often

Intoxication: Bacillus cereus

Bacillus cereus bacteria presents two types of illness; diarrhea and vomiting.

Source:

Found everywhere in the environment, especially in soil.

Foods:

Diarrhea: soups, custards, meat, poultry

Vomiting: Chinese-style foods, rice

The Disease:

Symptoms are usually mild; nausea, cramps, vomiting (usually within 30 to 60 minutes) and diarrhea (usually three to five hours).

Prevention:

- Cook food thoroughly and do not allow toxins to form
- Keep hot food hot at 60°C or more (140°F or more)
- Keep cold food cold at 4°C or less (40°F or less)

- Vomiting is the most common symptom in intoxications.
- As you eat the toxin and it enters into your system, your body realizes that this is not good for it and vomits this poison out.

Examples of bacteria which produce toxins are *Staphylococcus aureus* (found on skin, nose and throat), *Bacillus cereus* (found in cooked rice) and *Clostridium botulinum* (found in inadequately processed canned/bottled foods).

Parasites

- An organism that causes illness by living and feeding off a host organism.
- Some parasites are very painful such as *Trichinella spiralis* (Trichinosis) as it goes directly into your muscle and forms a spiral.
- Examples of parasites are *Giardia lamblia*, *Trichinella spiralis* and *Entamoeba histolytica*.
- Most parasites are transferred to humans through water contaminated with feces or through animals that are fed an unsafe food supply.
- Food handlers with these parasites, with or without symptoms, can contaminate food by not washing their hands after using the washroom and then handling food. Washing raw vegetables and fruits with contaminated water can also spread parasites.

Viruses

- Micro-organisms that multiply inside living cells and cause illness.
- A virus behaves like a parasite as it needs a host to survive and feed off. However, a virus will go directly into another cell and use its reproductive system as its own. Antibiotics do not work against viruses but some vaccines will help prevent the spread of the viruses.
- Examples of viruses are *Hepatitis A*, *Norwalk virus*, and *Rotavirus*.
- Viruses are spread in the same way as bacteria. However, some viruses can survive on counter tops and food contact surfaces for a long period of time.

2. Chemical



- Chemical food poisoning can occur when poisons are accidentally added to food.
- Vomiting usually occurs within one hour after eating the contaminated food.
- Examples of chemicals that can contaminate food are pest control sprays, cleaners, degreasers or food additives.
- It is important to label and store pest control sprays and cleaners in separate compartments separate from food. If space is limited, make sure these items are stored below food to prevent it from spilling onto the food.
- Chemicals must be stored in their original containers or in properly labelled containers.
- Containers with food labels must not be used as people will mistakenly think the chemical is a food product.

3. Allergic Reaction



- An over-reaction of the immune system.
- Not all people are allergic to the same things. Allergens, once ingested, cause the body to produce an excess amount of histamines which can result in many types of symptoms.
- Anaphylaxis, a severe, life-threatening reaction may result.
- Medical attention may be required when an allergic reaction occurs.
- Main symptoms are vomiting, diarrhea, nausea and throat itchiness and swelling.
- Symptoms could include sneezing, runny nose, watery eyes, fatigue, hives, coughing, tightness in the chest, difficulty breathing and headaches. In severe cases, death may occur.
- Examples of substances that can cause an allergic reaction are peanuts, eggs and seafood.

- Products of these substances, for example, peanut oil and salad dressing, can be just as harmful.
- MSG and sulphites are food additives that can cause a food intolerance with similar symptoms.
- People with a heightened sensitivity to these substances can experience allergy like symptoms. MSG is a flavour enhancer and cooking aid. Sulphites are used to keep fruit and vegetables looking fresh. Examples of these additives are Accent and Sta-Fresh.
- Food intolerance does not affect the immune system but medical attention may still be necessary.
- Cross-contamination could result in an allergen being served to the customer without realizing it. Refer to Cross-Contamination Section for details (page 16). A very small amount of allergen could be dangerous.
- Be aware of those food items that can cause allergic reactions.
- Where possible, substitute with food that is less likely to cause an allergic reaction. An example is substituting vegetable oil for peanut oil.

Call 911 if a customer is having a severe allergic reaction.

Allergies and the Role of the Foodservice Industry

- Keep an accurate list of all ingredients that are put into the food item.
- Keep ingredient lists from packages of all pre-packaged food.
- Ingredient lists should be provided to the customers upon request.
- If you are not sure of the food's ingredients, tell the customer that you are not sure.
- Do not cross-contaminate food.

4. Physical Contaminants

It is important to protect food from physical contaminants that may accidentally enter the food.

Such physical objects can include band aids, broken glass or plastic, hair, and metal fragments. Ensure the food preparation area is free of physical hazards and your equipment, including preparation utensils, are in good repair. Cover all foods and food containers to protect them from contamination.

What to do if Someone Reports a Possible Foodborne Illness

Call the Health Department and advise the customer to call the Health Department.

Call your local Health Department and speak to a Public Health Inspector. Provide them with as much information as possible to help in the investigation. The Public Health Inspector's job is to ensure the incident does not happen again, not to find blame.

Ask the customer what they ate and when (date and time).

The time of meal and the time of onset of symptoms are very important in determining the type of illness.

Ask the customer what his/her symptoms were and when they started.

Not all food poisonings are caused by

the last meal eaten. Very often the food causing illness was eaten days before symptoms began.

Review with the staff how the meal was prepared (using the HACCP system. Refer to the HACCP Section for details, page 18)

Ask staff if they were ill with similar symptoms.

Food handlers with foodborne illness-like symptoms must not be handling food until they are symptom-free for at least 24 hours.

Food handlers with *Shigella*, *Typhoid Fever*, *Hepatitis A* and *Norwalk*-like virus must not handle food until they are cleared by the Health Department.

Save food samples from original meal if possible.

These samples should be labelled and stored in the refrigerator. Food samples from the original meal will be sent to the Public Health laboratory for testing to determine if there are any pathogens present. The Health Department will also ask the customer to submit a stool sample for testing to determine if there are any pathogens present. A confirmed foodborne illness only occurs when the pathogens from the original meal and the customer are the same.

Write down all this information.

Keep accurate notes and records in case of further action by the customer.

Review Questions: *Foodborne Illness*

1. Pathogenic micro-organisms cause illness:

- a) True
- b) False

2. Food poisoning:

- a) Is caused by the last meal you ate
- b) Can have numerous symptoms such as diarrhea and vomiting
- c) Is only caused by one type of micro-organism
- d) Can be stopped by not eating in restaurants

3. The following are types of micro-biological food poisonings:

- a) Infections
- b) Intoxications
- c) Parasitic
- d) All of the above



Safe Food Handling

Temperature Control

Most food poisonings are caused by incorrect holding temperatures during the storage of hazardous foods.

This includes storage in the refrigerator and holding hazardous food on a steam table at improper temperatures. Other causes of food poisonings are cross-contamination of raw and ready to eat foods, improper cooking, improper reheating or cooling of hazardous foods, improper or lack of hand washing and food from unsafe sources.

Use a probe thermometer to take the internal temperature of food.

It is important to ensure the probe thermometer you are using is accurate. In order to determine this it is necessary to calibrate your thermometer on a regular basis. Refer to Appendix (page 25) for the calibration process.

Procedure for using your probe thermometer:

1. The probe must be inserted to the thickest part of the food. Make sure the probe does not touch bone or the container.
2. Clean and sanitize the probe after each use and before inserting it into the next food item.
3. Record temperatures in a log book.

The Danger Zone

The Danger Zone is the temperature range between 4°C and 60°C (40°F and 140°F).

Keep food out of the Danger Zone. Bacteria will multiply quickly in the Danger Zone. Bacteria grow extremely well at body temperature, 37°C.

Keep hot food hot (60°C, 140°F or above).

Have a probe thermometer available to check the temperature of the food on the steam table and on the stove. Cover food to keep the heat in and to prevent contamination.

Keep cold food cold (4°C, 40°F or below).

Provide a reliable thermometer to ensure proper operation of the refrigerator. Place food in the refrigerator so that air can circulate around it freely to maintain proper temperature.

Do not allow hazardous food to be in the Danger Zone longer than two hours when preparing food.

Move hazardous food through the Danger Zone as quickly as possible.

Cool food quickly using shallow pans or an ice bath.

Do not allow food to cool to room temperature before chilling in a refrigerator.

Quickly reheat food to at least the original cooking temperature within two hours.







See page 15 for a list of cooking and reheating temperatures. Whole chickens must be cooked to 82°C but can be reheated to 74°C.

If hazardous food is displayed for sale at room temperature for any length of time, the food must not be eaten and must be discarded.

Pathogenic bacteria will not multiply fast enough to cause food poisoning outside the Danger Zone but will multiply fast enough in the Danger Zone.

Cook Food Thoroughly

- Make sure all hazardous food is cooked and reheated to an internal temperature as listed below.
- Check internal temperatures with a probe thermometer.

	Whole Poultry (chicken, turkey)	82°C	180°F
	Poultry Pieces or Ground Poultry	74°C	165°F
	Hazardous Food Mixtures	74°C	165°F
	Ground Meats (beef, pork, lamb)	71°C	160°F
	Pork & Pork Products	71°C	160°F
	Fish	70°C	158°F

Use a probe thermometer to check cooking temperature.

Ground Meat

Cook hamburger (not poultry) all the way through to an internal temperature of 71°C (160°F), making sure the juices run clear and the meat is brown or grey.

Ground meat is very dangerous as the pathogens are mixed throughout the meat mixture in the grinding process. An illness caused by eating improperly cooked ground meat, commonly known as “hamburger disease,” is caused by *E. coli* 0157:H7.

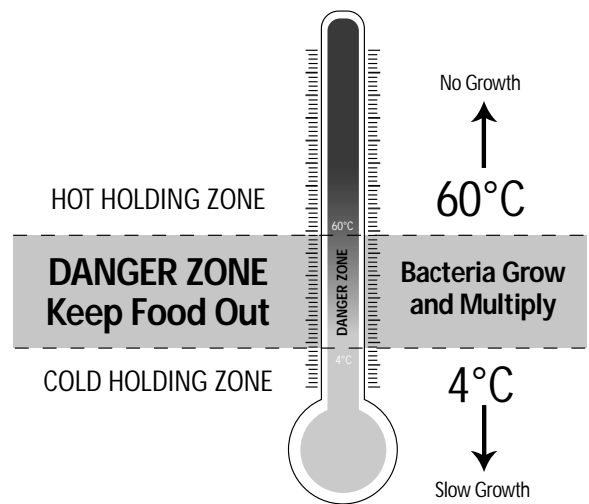
Poultry

Make sure poultry is fully cooked. Do not partially cook poultry and finish cooking it at a later time.

Poultry is one of the most common sources of foodborne illness. Assume all poultry is contaminated with pathogenic bacteria. *Salmonella* and *Campylobacter* are the most common types of pathogenic bacteria associated with poultry.

Defrost Food Safely

- Keep frozen food below -18°C(0°F).
- Pathogenic bacteria do not grow below -18°C(0°) but will survive.
- Storing hazardous food at -20°C (-4°F) or below for seven days or at -35°C (-31°F) or below for 15 hours will kill parasites and their eggs.
- Food can also be stored at -18°C (0°F) or below for 21 days to kill the parasites and their eggs.
- Food can be safely defrosted in the refrigerator, under running cold water or in the microwave.
- Food can also be cooked from frozen safely.
- Make sure the outside of the food is kept cool and out of the Danger Zone.
- Defrost and clean refrigerators regularly for efficient operation. All interior surfaces, racks, trays and the fan grill must be washed and sanitized at least once a week to prevent odours and maintain cleanliness.



Cross-contamination

Cross-contamination occurs when safe to eat food comes into contact with pathogenic bacteria, chemicals or unwanted items making the food unsafe to eat.



This commonly happens in three ways:

1. Raw food (meat/poultry, etc.) or its juices come in contact with cooked food
2. Using the same equipment, to handle raw and cooked food
3. Contaminated hands touching food

Preventing Cross Contamination

- Store cooked or ready to eat food above raw food or in a separate refrigerator.

This will prevent the juice from raw food dripping into cooked or ready-to-eat food. All food must be covered when stored in the refrigerator to protect it from contamination as well. Do not store food on the floor of walk-in refrigerators. Rotate stock to ensure food does not sit too long.

- Make sure cutting boards, knives and equipment are cleaned and sanitized after they come in contact with hazardous food.
- When tasting food, use the two spoon method to prevent cross-contamination. One spoon scoops out the food and places it onto the second spoon. The second spoon is used to taste the food.
- Label chemicals and pesticides and store them in a separate area away from food.
- Mops, brooms and brushes must be stored in a separate room.

When cooking meat:

- Use separate tongs to handle raw and cooked meat.
- Do not place cooked meats on the same plate that had the raw meat on it.
- When cooking meat, do not brush marinade on the meat in the last 10 minutes of cooking as this contaminates the cooked meat with raw juices.

Hand Washing

Frequent hand washing can reduce the chances of catching a cold or flu during the winter months by over 80%.



Wash your hands after:

- Handling hazardous or raw food
- Sneezing or coughing
- Touching something contaminated
- Smoking
- Using the washroom

Many pathogens are passed between people through improper hand washing when handling food. Hand washing is the best way to prevent the spread of disease. Hands must also be washed before starting work, before handling any food, whenever they are visibly dirty or after finishing one job and before beginning another job. Hands must be scrubbed for at least 15 seconds with soap.

Hand Washing Basins

They are required by legislation.

- Handwashing basins must be easy to get to so employees can wash their hands often.
- If the hand washing basin is not accessible, it will discourage employees from washing their hands.
- Hand washing basins must be used for hand washing only and not for dishwashing or food preparation.
- Separate sinks must be provided for dishwashing and food preparation to prevent cross-contamination.
- Hand washing basins must have hot and cold running water, soap in a dispenser and paper towels.
- These items will help employees wash their hands properly. Bar soap is not permitted.

Glove Use

Using gloves does not replace hand washing.

They are only a tool and must be used properly to ensure food safety.

The wearing of gloves to handle food is not required by law in Ontario.

Plastic or vinyl gloves can be used to prevent cross-contamination in the following manner:

- Washing hands thoroughly before and after wearing gloves
- Any cuts or wounds on hands are properly bandaged and protected
- Replace gloves after each task
- Gloves are properly stored to protect them from contamination

Personal Hygiene

Employees must not smoke in Food Premises.

This will keep their hands away from their mouth and will also prevent ashes and butts from getting into the food. As well, employees should not chew gum in the kitchen area as this will spray micro-organisms onto the food.

Food handlers must wear headgear that confines the hair.

Hair nets, chef's hats and baseball caps are acceptable headgear. The hair must be confined to prevent hair from falling into the food and to stop food handlers from touching their hair to move it out of their face. Hair has also been known to cross-contaminate food.

Food handlers must wear clean clothing and change aprons as often as necessary.

Do not wear uniforms outside of the establishment. Always change and hang clothes in the change room, never in the kitchen or food storage areas.

Food handlers are not to handle food if they are ill with diarrhea, vomiting, coughing or sneezing. Food handlers must not handle food with their bare hands if they have open cuts on their hands or are wearing band-aids. Gloves must be worn.

Hazard Analysis Critical Control Point System (HACCP)

1. Looks at hazardous and high risk food
2. Identifies the greatest risk factors of the food known to cause foodborne illness
3. Makes the changes necessary to reduce or eliminate the risk
4. Monitors the overall food handling

HACCP was developed by Pillsbury Foods and NASA to ensure their astronauts would have a safe source of food in space.

Hazard Analysis:

A review of recipes to determine which food requires a lot of handling and has a high possibility for time and temperature abuse.

Critical Control Point (CCP):

A point where a hazard exists and a control measure is used to eliminate, prevent or minimize that hazard.

1. Review recipes and assess their risk

There are three levels of risk in HACCP. Examples of low risk foods are cereals, bread, fruits and vegetables. Examples of medium risk foods are hazardous foods with little handling and potential for temperature abuse. Examples of high risk foods are poultry and its products, beef, veal, pork, seafood, mixed salads, rice dishes, dairy products and cream products.

- Review recipes listing each step and its level of hazard,

Six Steps to a HACCP System

paying special attention to food with high risk ingredients.

- Break down recipes into delivery, storage, preparation, cooking, portioning, serving and use of leftovers.

Delivery is the approving and receiving of food. Storage is the storing and refrigerating of ingredients. Preparation is the thawing, cutting, chopping, deboning, mixing, washing and marinating of food. Cooking is the roasting, grilling, barbecuing, stir-frying and combining of ingredients. Portioning is the slicing, deboning, arranging for serving of cooked food. Serving is the giving to the customer directly to eat, take-out or offering for sale on a buffet. Use of leftovers is the refrigerating of food for later use.

- Use a flow chart diagram to show each step, the equipment used, the personnel involved, the location of the process and other processes in the same area.

This step will help you in staffing and efficient flow of product.

2. Identify Critical Control Points (CCP)

- On the flow chart, record the expected time, temperature and amount of handling involved in each step according to the recipe.
- Break down each step and look for the possibility of contamination and growth of micro-organisms.
- The most hazardous steps should be looked at most carefully. The time and temperature relationship and the amount of handling with the type of food will determine the risk.
- There are five basic food service systems. Each system can stand as a recipe on its own, or a combination of systems can add up to a recipe for a food item.
 1. assemble/serve – CCP: source of food
 2. cook/serve – CCP: cooking
 3. cook/hold – CCP: cooking and hot holding
 4. cook/chill – CCP: cooling
 5. cook/freeze – CCP: cooling
- When reviewing recipes and applying the basic food service systems, it reveals that each recipe has a time-temperature CCP.

3. Make a plan to use preventive and control measures

- Minimize contamination of food by killing pathogenic micro-organisms, destroying toxins or stopping

pathogenic micro-organism growth.

- Look at those steps that are the most hazardous and try to reduce the food's time in the Danger Zone. Also, reduce the amount of people that handle food and use sanitized utensils where possible. Use accepted food handling practices.
- Plan how the recipe can be changed in case monitoring reveals problems.

4. Monitor CCPs

- Watch food preparation and measure the actual time, temperature and amount of handling at all the steps and record this information on the flow chart.
- Record the time and temperature on the chart as well as the amount of food for each item.
- All steps must be monitored to make sure the planned control and preventive measures work.
- The control measures are to remove or minimize the hazardous step in the process.

5. Take immediate action to correct any problems

- Action must be taken when time and temperature measurements show that there is unsafe food practices.
- If the control measures implemented in Step 4 are not working as planned, alter the control measures until they are minimizing the hazard.

6. Keep a log of recipes

This log will contain the recipe, its flow chart, time, temperature and amount of handling at each step. Review the procedures often and record the proper preparation steps and handling concerns.

Review Questions: *Safe Food Handling*

1. The Danger Zone is:

- a) The temperature range between 7°C and 65°C (44°F and 149°F)
- b) The temperature range between 4°C and 60°C (40°F and 140°F)
- c) The temperature range between 2°C and 57°C (36°F and 136°F)
- d) None of the above

2. Cook hamburgers until:

- a) The internal temperature of the food is 71°C (160°F)
- b) The meat is grey or brown
- c) The juices run clear
- d) All of the above

3. Proper temperature controls and avoiding cross contamination can eliminate most Foodborne illness

- a) True
- b) False

4. HACCP:

- a) Breaks down a recipe into steps
- b) Identifies critical control points
- c) Uses preventive measures at the most dangerous steps
- d) All of the above



Dishwashing

Machine Dishwashing

- Follow manufacturers' and chemical suppliers' instructions.
- Monitor wash and sanitizing time and temperatures.
- Wash temperature should be between 60° and 71°C (140°F and 160°F). A machine will sanitize either with chemicals (low temperature) or by hot water (high temperature) In a high temperature sanitizing cycle, the water must be 82°C (180°F) for 10 seconds.
- Machine must be cleaned each day paying special attention to jets and strainers.

Food Premise Sanitation

Cleaning and Sanitizing

Utensils, multi-service articles, equipment and food contact surfaces must be cleaned and sanitized after each use.

Utensils and multi-service articles must be cleaned and sanitized in a machine dishwasher or using the three-compartment sink technique to reduce the potential for the spread of pathogenic bacteria.

Floors, walls, ceilings, equipment and washroom fixtures must be cleaned and sanitized on a regular basis.

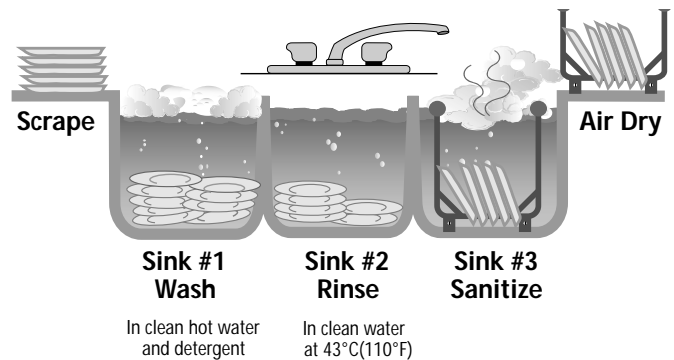
This will keep your establishment clean, reduce the potential for cross-contamination and minimize pest infestations.

Garbage containers and garbage areas must be cleaned and sanitized on a regular basis.

This will reduce odours and the spread of harmful micro-organisms.

Manual Dishwashing

Three Compartment Sink



Sanitize

Soak dishes for at least 45 seconds:

1. In water at 77°C (170°F)

OR

2. Use clean warm water with a sanitizer such as:

- Chlorine, 100 parts per million (ppm), or
- Quaternary Ammonium, 200 ppm, or
- Iodine, 25 ppm

Two Compartment Sink



<p>Wash In clean hot water and detergent</p> <p>AND</p> <p>Rinse With clean water (43°C/110°F)</p>	<p>Sanitize Soak dishes for at least 45 seconds:</p> <p>A. In water at 77°C (170°F)</p> <p>OR</p> <p>B. Use clean warm water with a sanitizer such as:</p> <ul style="list-style-type: none"> • Chlorine, 100 parts per million (ppm), or • Quaternary Ammonium, 200 ppm, or • Iodine, 25 ppm
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Dishwashing by Hand

Change water frequently to maintain minimum temperatures and concentration of solutions.

As dishes are being washed, the temperature of the water will decrease and the sanitizer will be used up. Thermometers and test papers must be used to test the temperature and the concentration of sanitizing solution.

A “wash-in-place” procedure must be used for large equipment.

The equipment must be washed or scrubbed with a detergent solution, rinsed with clean water and sanitized. Sanitizing can consist of hot water or steam sprayed on the treated surface to a minimum temperature of 82°C (180°F). A chemical solution sprayed on the treated surface at double the strength used for manual dishwashing is acceptable.

Store clean dishes and utensils properly to protect them from contamination.

Examine dishes and utensils. Re-wash any dirty dishes and discard any damaged items. Store utensils with all handles pointing in one direction and with eating and food contact surfaces protected.

Use the handles when touching utensils.

This will not re-contaminate the cleaned and sanitized utensils. Do not touch the business end of the utensil.

Chlorine, quaternary ammonium and iodine are acceptable sanitizers. Vinegar is not a sanitizer.

100 mg/L chlorine solution, 200 mg/L quaternary ammonium solution or 25 mg/L iodine solution at a minimum temperature of 24°C are acceptable sanitizing solutions and temperatures. Dishes must be immersed in the sanitizing solution for a minimum of 45 seconds.

How to mix a chlorine solution for sanitizing using bleach

Sanitizing	How to Mix	Solution Strength
Dishes e.g. cutting boards, knives, cooking utensils	Mix ½ teaspoon of household bleach with one litre of water	100 PPM chlorine solution • immersion
Equipment e.g. large equipment, tables, anything that cannot fit into a sink	Mix one teaspoon of household bleach with one litre of water	200PPM chlorine solution for sanitizing spray • clean-in-place

Tips to Remember

- Make a new sanitizing solution daily.
 - Do not mix bleach with detergent.
 - Using chlorine test strips, check the strength of the solution.
 - Discard used sanitizing solution as needed.
- The strength of the solution will be weaker after use.

Housekeeping

- Clean floors using damp mops at least once daily.
- Do not dry sweep floors as this will cause dust and dirt to fly into the nearby food.
- Keep walls, ceilings and light fixtures clean and in good repair.
- Provide sufficient lighting to help clean. Replace burned out bulbs promptly. Ensure light fixtures have covers to prevent breakage.
- Remove dirt from under equipment, in corners and in hard-to-reach places. This will eliminate a food supply for pests and keep your establishment clean.
- Store all supplies at least 15 cm (6 in.) off the ground to allow for proper cleaning and to help reduce pest problems. This will also allow for good air circulation and not cause food to go soggy or mouldy.
- Keep equipment clean and in good repair.
- Take apart, clean and disinfect food preparation and service machines daily.
- Clean and sanitize all tables, counters and work surfaces often. Pathogenic bacteria can be on these surfaces and transferred to the food.
- A sanitizing solution of 200 mg/l bleach can be used to spray on and/or wipe down tables, counters and work surfaces.
- Sanitizing solutions stored in a spray bottle should be changed daily. Solutions stored in a bucket should be changed at least 3 - 4 times per day.
- Mechanical ventilation hoods, filters and vent pipes that remove heat, steam and odours must be cleaned often.
- Clean filters will extend the life of your exhaust fan as it will not have to work as hard. A clean ventilation system will also help prevent infestations and fires.
- Wash and sanitize empty food bins and containers before refilling them.
- Clean food bins will keep your food fresh longer, minimize pest infestations and not spread pathogenic or spoilage micro-organisms.

Sanitary Facilities

- Clean washrooms, toilets, lockers and change rooms at least once daily or more often if required.
- Provide a constant supply of hot and cold running water, soap in a dispenser and paper towels.
- Remember, hand washing using the supplies provided will help prevent the spread of disease. Air dryers can be used instead of paper towels.
- Provide a garbage container. This will keep your washroom tidy and discourage customers from throwing their paper towels in the toilet and on the floor.

Provide:

- A self-closing device on the door
- A sign easily recognizable on the door
- A lockable door for the toilet

Pest Control

Eliminate nesting areas by removing unused equipment and by keeping all areas clean, especially behind equipment and shelving.

Keeping walls and floors in good repair will also help eliminate nesting areas.

Keep pests out by screening doors and windows.

The best pest control is to keep pests out. If doors and windows are used for ventilation purposes, screening must be provided.

Caulk and fill all holes with steel wool.

This is very important around pipe and drain openings in the walls and floors as pests use these as pathways.

Check deliveries for infestations.

For mice, look for droppings and gnawing on packaging. For cockroaches and other insects, look for actual sightings (live and dead), droppings and damaged product and packaging.

Eliminate any food and water source.

The lack of a food supply will make the poison bait more effective as they will be hungry and eat more of the poison bait.

Have a licensed pest control company on contract.

These people are professionals and can help prevent problems before they occur.

Protect poison bait from contamination.

Use covered bait stations to protect the bait and your food products from contamination. Place covered bait stations along walls out of harms way. Know where the bait stations are located and check them regularly to ensure the bait is fresh.

Poison bait must be labelled and stored in an area separate from food.

Doing this will prevent accidental chemical poisoning.

Properly dispose of any dead pests immediately.

When using poison baits, check surrounding areas for dead pests. When using snap traps, catchalls or glue boards, check devices daily for dead pests. Trapping devices must be placed on known pest pathways for maximum affect. For snap traps, common baits are peanut butter, bacon and chocolate. Tie the bait to the trigger using a thread.

Store garbage in pest proof containers and keep these areas clean.

Again, this will reduce their food supply making the poison bait more effective.

Review Questions: Food Premise Sanitation

1. Sanitizing utensils is important because:

- a) It will reduce the transfer of pathogenic micro-organisms
- b) It makes the dishes shiny
- c) It removes fingerprints
- d) None of the above

2. The proper use of a three compartment sink is:

- a) Clean and rinse in the first sink, sanitize in the second sink, rinse in the third
- b) Clean in the first sink, rinse in the second, sanitize in the third
- c) For hand washing and washing vegetables only
- d) For washing vegetables only

3. Washrooms must have the following items:

- a) Hot and cold running water
- b) Soap in a dispenser and paper towels
- c) A garbage can
- d) All of the above

Appendix

Glossary

Allergy

A condition of heightened sensitivity to a substance such as food.

Anaphylaxis

A severe, life threatening, generalized allergic reaction.

By-laws

Laws created by Municipal or Regional governments to deal with important issues that fall under their jurisdiction and are not dealt with at the provincial or federal level.

Chlorine

A greenish, yellow, poisonous gaseous element used as a disinfectant or sanitizer. Usually used in a liquid form for disinfecting food contact surfaces and the sanitizing sink in two and three sink dishwashing systems.

Clean

To remove oil, grease, dirt and debris using soap and water.

Contamination

Introduction of micro-organisms or disease agents into food.

Critical Control Points (CCP)

In a Hazard Analysis Critical Control Point System, the point in a recipe where a hazard exists and a control measure is used to eliminate, prevent or minimize that hazard.

Cross-contamination

The introduction of micro-organisms or disease agents from raw food into safe or ready to eat food making the ready to eat food unsafe. This can happen in three ways: 1. Raw food or its juices come in contact with cooked or ready to eat food. 2. Contaminated hands touching food. 3. Using the same equipment or utensils to handle raw and cooked food.

Cutlery

Multi-service articles such as knives, forks and spoons.

Danger Zone

The temperature range 4°C to 60°C (40°F and 140°F), in which micro-organisms grow and multiply extremely well.

Diarrhea

A disorder of the intestine marked by abnormally frequent and fluid evacuation of the bowels.

Disease

A condition of ill health.

Disinfection Solution

A mixture of a disinfection chemical and water in a certain ratio that will be used to disinfect or sanitize food contact surfaces, equipment and multi-service articles.

Enterotoxin

A toxin specifically affecting the lining of the intestine.

Foodborne Illness (Food Poisoning)

A disease caused by eating or drinking contaminated food and/or water.

HACCP (Hazard Analysis Critical Control Points)

A system used throughout the food industry to enhance food safety. The system looks at hazardous food, identifies the greatest risk factors, makes the necessary changes to reduce or eliminate the risk and monitors the overall food handling.

Hand washing

The physical action of removing dirt and micro-organisms from the hands using soap and water, scrubbing for at least 15 seconds, rinsing and drying with paper towels.

Hazardous Food

Food that is able to support the growth of pathogenic microorganisms or the production of toxins.

Host

Any living organism (often human) in which micro-organisms grow and multiplies or toxins exerts its effect.

Infection

A condition in which micro-organisms establishes itself and grows and multiplies in the host's body.

Intoxication

An adverse reaction by the body to a foreign (toxic) substance, whether the substance was produced within or outside the body.

Iodine

A chemical used as a disinfectant or sanitizer. Very expensive and can stain multi-service articles.

Micro-organisms

Invisible living single cells.

Multi-service Articles

Cutlery (forks, knives, spoons) and dishes (plates, bowls, cups) that must be cleaned and sanitized after each use.

Parasites

Organisms that cause illness by living and feeding off a host organism. Does not necessarily cause disease.

Pathogen

Harmful micro-organisms that can cause disease in humans.

Pathogenic Bacteria

Colourless and odourless bacteria that causes disease in humans.

pH

Is the measure of the level of acidity or alkalinity of a solution and ranges from 0 to 14. Pathogenic bacteria need a neutral environment to survive. High or low pH will not kill pathogenic bacteria but will not allow them to grow.

Preparation (of food)

The final stage(s) of readying a food to be eaten, whether commercially or in the home, usually done in a kitchen.

Processing (of food)

The treatment of food, usually on a commercial scale, to increase its usefulness, stability or acceptability.

Production (of food)

The growing, usually under human supervision, of the basic animal or vegetable material of a food.

Protein

Complex organic nitrogenous compounds that are used as a food source by living organisms.

Provincial Legislation

Acts and regulations passed by the provincial government. The legislation must be followed throughout the province.

Quaternary Ammonium

A chemical used as a disinfection or sanitizer. Commonly used in the sanitizing rinse cycle of mechanical dishwashers.

Retailing (of food)

The display and sale of food in a store for later consumption off the premises.

Sanitize

To destroy unwanted contaminants such as bacteria and viruses using a chemical substance to kill 999 out of 1000 pathogenic micro-organisms.

Service (of food)

The final preparation and sale or giving of food for consumption on the premises (in a restaurant or cafeteria) or elsewhere (a take-out); can also include outdoor group feeding at picnics.

Source (of a contaminant)

Where micro-organisms originates (human or animal intestines).

Spores

A resistant body formed by certain micro-organisms when exposed to unfriendly environments.

Sterilize

To kill all micro-organisms.

Utensils

Multi-service articles used in preparation, cooking and serving such as ladles, tongs and spatulas.

Viruses

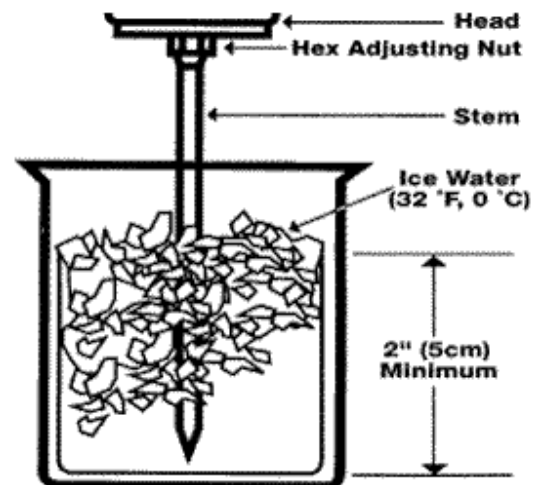
Micro-organisms that multiply inside living cells and cause illness.

Wash In Place

A system to clean, rinse and sanitize large equipment that cannot be cleaned in a dishwasher or sink. The equipment must be washed with soap and water and rinsed with clean water. The sanitizing rinse can consist of hot water or steam sprayed on the treated surface to a minimum temperature of 82°C or a chemical solution sprayed on the treated surface at double the strength used for manual dishwashing.

Calibrating Your Thermometer

- Fill a medium-sized glass with ice. Add water to ice. Place thermometer in glass of ice water.
- Wait three minutes. Stir water occasionally.
- After three minutes, thermometer should read 0°C (32°F).
- If not, leave probe in ice water.
- Using pliers or a small wrench, turn the adjustable nut on the back of the thermometer head until the needle reaches 0°C (32°F). You may need to add more ice.
- Wait three minutes. Stir occasionally. Readjust the nut if required for the needle to read 0°C (32°F).



Common Types of Food Poisoning

Disease-Causing Organism & Incubation Period	Main Sources of Infection (Food usually Contaminated)	Symptoms
<p>Salmonellosis <i>Salmonella</i> species 6 to 72 hours (usually 18 to 36 hours)</p>	<p>Raw or undercooked poultry, meat, eggs, prepared food; meat contaminated by feces, food handlers with poor hygiene. Contact with contaminated food (raw chicken, meat) can spread salmonella to other items (cooked or ready-to-eat dishes, salad) via countertops, cutting boards, utensils, hands. Survives inadequate cooking and may grow and multiply in cooked meat, poultry, stuffing, gravy and fish.</p>	<p>Diarrhea, abdominal cramps, mild fever, nausea, most severe in the very young and elderly. Can be fatal in infants, the elderly and people with depressed immune systems. Most severe if acquired from fatty food (e.g., cheese, hamburger, salami, hot dogs, chocolate).</p>
<p>Staphylococcal Food Poisoning <i>Staphylococcus aureus</i> species 1 to 8 hours (usually within 2 to 6 hours)</p>	<p>Found in nose, throat, on skin, fingertips of 30-50% of healthy people. Spread by food handlers, coughing, sneezing and other unsanitary practices; also via dirty skin, pimples. Grows best on protein-rich food; meat, poultry; fish, milk, cheese, custards and much-handled food such as sandwiches, pasta, potato salad.</p>	<p>Vomiting, nausea, abdominal cramps, diarrhea, chills, possibly weak pulse and shallow breathing. Usually uneventful recovery 24 – 48 hours.</p>
<p>Campylobacteriosis <i>Campylobacter jejuni</i> 2 to 7 days (usually 3 to 5 days)</p>	<p>Found in gastrointestinal tracts of wild and domestic animals. <i>C.jejuni</i> contaminates raw meats and poultry during processing through contact with feces. Other sources of contamination: raw milk, untreated water, clams, undercooked beef, chicken.</p>	<p>Fever, diarrhea, abdominal cramps and possibly bloody stool.</p>
<p>Clostridium Perfringens <i>Clostridium perfringens</i> 8 to 27 hours (usually 10 hours)</p>	<p>Grows quickly in large portions of food cooked too slowly or kept at room temperature, especially meat or poultry dishes. Present in soil, intestines or animals. Commonly spread if meats or poultry are kept in serving dishes that don't stay hot enough or if large portions are chilled too slowly; also from rice and refried beans.</p>	<p>Abdominal pain (sometimes severe) and diarrhea. Sometimes nausea and vomiting. Symptoms are usually mild but can be more severe in the ill and the elderly.</p>
<p>Botulism <i>Clostridium botulinum</i> 2 hours to 8 days (usually 18 to 36 hours)</p>	<p>Present in soil, oceans (can grow in salty conditions). Vegetables, seafood often contaminated. Transmitted via low-acid canned goods (including home canned products such as asparagus, corn, beans); soil-contaminated food in low oxygen environments (e.g., potatoes, garlic coated with oil); improperly fermented Inuit meat products.</p>	<p>The botulinal toxin attacks the nervous system causing nausea, vomiting, fatigue, headache, dry mouth and skin, constipation, paralysis, double vision, breathing difficulties. Can be fatal. Antitoxin prevents death from suffocation. Slow recovery.</p>
<p>Listeriosis <i>Listeria monocytogenes</i> 4 to 21 days</p>	<p>Grows at cool temperatures. Forage, meat, water, silage, unpasteurized milk, sausages, coleslaw, raw milk products.</p>	<p>Fever, intense headache, nausea, vomiting, meningoencephalitis, delirium, coma, collapse (case fatality rate varies from 19 to 50%).</p>

Disease-Causing Organism & Incubation Period	Main Sources of Infection (Food usually Contaminated)	Symptoms
<p>Foodborne Infections</p> <p>1. Enterohemorrhagic <i>Escherichia coli</i> O157:H7 3 to 7 days (usually 3 to 4 days)</p> <p>2. Other <i>Escherichia coli</i> Infections Other <i>Escherichia coli</i> species 24 to 72 hours</p>	<p>Fecally-contaminated water and food, raw meats, undercooked ground beef, ham, turkey, roast beef, sandwich meats, raw vegetables, unpasteurized milk and apple cider, raw milk cheeses, soft cheeses, mayonnaise, poor food-handling practices. Sewage contaminated shellfish.</p>	<p>Bloody or watery diarrhea, abdominal cramps, nausea, perhaps vomiting – lasting several days or weeks; some people with O157:H7 develop haemolytic uremic syndrome with possibly permanent kidney damage, even death.</p>
<p>Shigellosis <i>Shigella</i> species 1 to 3 days</p>	<p>Highly contagious – a few organisms required to spread the disease. Man, indirectly through food, water or milk that was contaminated by man.</p>	<p>Diarrhea, fever, nausea, vomiting and abdominal cramps. Bowel movements may contain blood, mucus and pus. Children may also experience convulsions.</p>
<p>Bacillus cereus (2 types of illness) <i>Bacillus cereus</i> Diarrhea: from soups, custards, meat, poultry. 8 to 16 hours Vomiting: from Chinese-style food, rice. 30 minutes to 5 hours</p>	<p>Found in dust, soups, cereal crops, custards, meat and poultry. Often associated with cooked rice.</p>	<p>Symptoms usually mild. Nausea, cramps, diarrhea</p> <p>Nausea, vomiting (occasionally diarrhea).</p>
<p>Yersiniosis <i>Yersinia enterocolitica</i> 3 to 7 days</p>	<p>Pork and pork products, chocolate milk and soybean cake.</p>	<p>Diarrhea, sometimes bloody, abdominal cramps and joint pain.</p>
<p>Hepatitis A <i>Hepatitis A virus</i> 10 to 50 days (usually 25 days)</p>	<p>Can be passed on by a food handler who has the disease. In salads, cold cuts, icing; also in shellfish from contaminated waters. Sewage contaminated drinking water.</p>	<p>Symptoms can be very mild. Fatigue, jaundice, fever, nausea, loss of appetite, dark-coloured urine and grey feces. occasionally fatal.</p>
<p>Amebiasis <i>Entamoeba histolytica</i> 2 to 4 weeks</p>	<p>Fecal contaminated water or food. Food that was handled by infected food handlers.</p>	<p>Fever, chills, abdominal cramps and diarrhea with blood or mucus.</p>
<p>Giardiasis <i>Giardia lamblia</i> 5 to 25 days (7 to 10 days most common)</p>	<p>Fecal contaminated water especially untreated water from lakes, rivers and streams. Food that was handled by infected food handlers.</p>	<p>Abdominal cramps, bloating, weight loss, fatigue and diarrhea. easy.</p>
<p>Cryptosporidiosis <i>Cryptosporidiosis parvum</i> 2 to 10 days</p>	<p>Contaminated drinking water and swimming pool water. Food that was handled by infected food handlers.</p>	<p>Diarrhea, abdominal cramps, nausea, vomiting and mild fever.</p>



For more information, contact

Halton Region

Dial 311 or 905-825-6000

Toll free 1-866-4HALTON (1-866-442-5866)

TTY 905-827-9833

www.halton.ca

Health Department

Promoting and Protecting Health.

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