

FOODSAFE LEVEL 1



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FOODSAFE Level 1 Participant Workbook





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FOODSAFE Program Overview

This section gives an overview of FOODSAFE Level 1. We'll talk about working in a 'culture of food safety' and why it is important for all food service workers to practice safe food handling.

We'll also talk about the roles and responsibilities of owners, operators, and health authorities in keeping food safe.

LEARNING OUTCOMES

**BY THE END OF THIS UNIT,
PARTICIPANTS WILL BE ABLE TO:**

- Describe a 'culture of food safety'
- Describe a food handler's responsibility in protecting food from contamination
- Identify applicable laws governing food safety and the authorities responsible for enforcement
- Explain how to handle a foodborne illness complaint



In a food service establishment that fosters a culture of food safety, everyone understands why certain procedures need to be followed. Whether you are an owner, manager, cook, dishwasher or server, you know that the safety of the food the establishment is serving rests with YOU!



Health Canada estimates that more than 4 million Canadians suffer from foodborne illness every year. Studies of foodborne illness outbreaks have identified several common mistakes that can happen at any step in the process of serving food to the public.



Whatever your role in your food service establishment, there are safe food handling practices that you can follow to protect your health, your customers' health, the reputation of your establishment, and your job!



Every jurisdiction in Canada has regulations that govern the safe production and sale of foods in food premises. These regulations describe how food premises must be constructed; how they are operated; what kind of food safety training is required for operators and staff; what types of equipment, utensils and surfaces must be used; sanitation procedures; and other factors that impact the safety of food served to the public.

Each province and territory in Canada has its own regulations with respect to food safety in the food service industry. It is the role of the responsible health authority to protect public safety by ensuring that food service establishments meet the food safety requirements. Regulations represent the minimum standard to be maintained.

Public Health Inspectors (PHIs) and Environmental Health Officers (EHOs) serve as consultants and educators for food safety as well as conducting inspections and enforcing regulations. The purpose of inspections is to make sure that food is being handled properly from receiving through preparation to serving, and that all regulatory requirements are being met.



See Appendix A for information about the food safety responsibilities of government agencies in Canada.

HANDLING A FOODBORNE ILLNESS COMPLAINT

All customer complaints of possible foodborne illness must be taken seriously. Regardless of whether or not food served at your establishment is found to be the source of the illness, handling customers' concerns thoroughly and professionally demonstrates that your establishment values the safety of the food you serve. When a customer reports an illness that may have been caused by food served at your establishment:



- Be polite and attentive.
- Record as much information as possible about the complaint on a Foodborne Illness Report form.
- Encourage the customer to contact the local health authority.
- File and keep the original Foodborne Illness Report, along with the health authority's inspection report once you receive it.
- Contact the local health authority yourself with the information you have recorded on the Foodborne Illness Report form.
- If the customer is still sick when you speak with them, recommend that they contact a health care professional. Never attempt to diagnose the illness or suggest treatments.

A Foodborne Illness Report sheet can be found on the foodsafety.ca website.



NOTES

The Causes of Foodborne Illness

This unit describes three causes of foodborne contamination: chemical, physical and biological; and identifies improper food handling practices that can lead to foodborne illness. We'll also discuss how to reduce the risk of allergic reactions to the food we serve.

LEARNING OUTCOMES

BY THE END OF THIS UNIT, PARTICIPANTS WILL BE ABLE TO:

- Give examples of chemical, physical and biological causes of food contamination
- Identify major improper food handling practices that have caused foodborne illness outbreaks
- Demonstrate an understanding of food allergies and list ways to reduce risk



THREE CAUSES OF FOOD CONTAMINATION



CHEMICAL

Some sources of chemical contamination include cleaning agents, pesticides and dissolved metals. Reduce the risk by storing chemicals away from food in properly labeled containers.

PHYSICAL


Some types of physical contamination include glass, wood, hair, bandages, insects, metal particles and stones. Reduce the risk by practicing good hygiene, inspecting all incoming food, storing food away from possible physical contaminants, and by following proper pest control programs and equipment maintenance.



BIOLOGICAL

Some sources of biological contamination include infected workers, contaminated work surfaces, cross-contamination, improperly washed dishes and surfaces, and contaminated water used in food preparation and dishwashing.

Most cases of foodborne illness in the food service industry are caused by biological contaminants, so FOODSAFE Level 1 will focus on reducing biological risk.



Learning how to handle food properly from receiving to serving, and making those safe food handling practices part of the culture of your food service establishment, can significantly reduce the risk of foodborne illness outbreaks.

Improper food handling practices that have caused foodborne illness outbreaks

- **Improper Cooling**
- **Advance Preparation**
- **Infected Food Handlers**
- **Improper Reheating**
- **Improper Hot-Holding**
- **Contaminated Raw Food or Ingredient**
- **Unsafe Source**
- **Use of Leftovers**
- **Cross-Contamination**
- **Inadequate Cooking**

FOOD ALLERGIES AND FOOD SERVICE

TOP 10 ALLERGENS

- Eggs
 - Milk
 - Mustard
 - Peanuts
 - Seafood
(fish, crustaceans, shellfish)
 - Sesame
 - Soy
 - Sulphites
 - Tree nuts
(almonds, hazelnuts, cashews,
and many others)
 - Wheat
- (Health Canada Priority Allergens)*

Symptoms of Allergic Reaction

Respiratory (breathing):
 difficulty breathing, speaking
 or swallowing

Cardiovascular (heart):
 light-headedness, dizziness,
 pale/blue colour, weak
 pulse, fainting, loss of
 consciousness

Gastrointestinal (stomach):
 nausea, cramps, stomach
 pain, vomiting, diarrhea

Skin: hives, swelling (face,
 lips, tongue), itching,
 warmth, redness

Neurological (brain):
 anxiety, feeling that
 something really bad is
 about to happen, headache,
 confusion, disorientation

Many Canadians (4–7%) are affected by a food allergy for which there is no cure. Strict avoidance of the food allergen is the only way for an individual with a food allergy to prevent an allergic reaction. Contact with an allergen, even a very small amount, can cause an allergic reaction that is **life-threatening** and is called **anaphylaxis**. Allergic reactions usually happen quickly, but some occur hours after exposure.

Symptoms can vary and are unpredictable. Anaphylaxis requires immediate treatment with epinephrine and quick transportation to hospital by ambulance. If left untreated, anaphylaxis can cause death.

The most dangerous symptoms of an allergic reaction are any **difficulty breathing** and a **drop in blood pressure** which makes a person feel light-headed, dizzy or feeling like they may faint.

If someone tells you that they are experiencing an allergic reaction, believe them! They are often aware of symptoms that you cannot see, and immediate attention and treatment can save their life.

To help prevent an allergic reaction to foods served in your establishment:

Clear communication is vital!

When a customer asks about ingredients, always check with the chef or designated individual at your restaurant to respond to these questions. **If you cannot verify ingredients with absolute certainty, advise the customer that you are not sure. Never guess!**

Never substitute ingredients unless

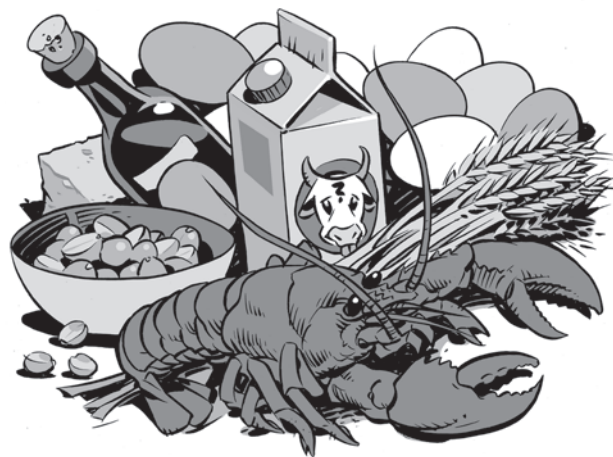
everyone is aware and the change is reflected on the menu.

Remember that an ingredient can have many different names. For example, “milk” can also be labelled as casein, curds, delactosed whey, lactate, or whey.

Also remember that some food items are made up of many ingredients that can contain allergens. For example, Worcestershire sauce can contain fish. Another common example is chocolate chips which can sometimes contain tree nuts, milk, and peanuts.

Always use separate utensils, cookware and cutting boards, and properly clean food surfaces (both front and back of house) to prevent cross-contamination of potential allergens. The safest option is to prepare meals for allergic customers “**off-line**” using fresh ingredients in a separate and clean area of the kitchen.

Additional information on food allergies and best practices for preventing allergic reactions can be found in Appendix F. We recommend you take a few minutes to review this information.

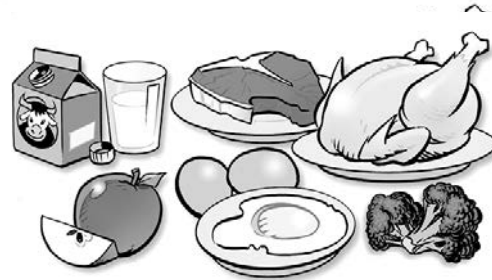


This unit focuses on biological causes of foodborne illness, defining and explaining five types of microbes and their sources, and describing how pathogens are transmitted to food.

LEARNING OUTCOMES

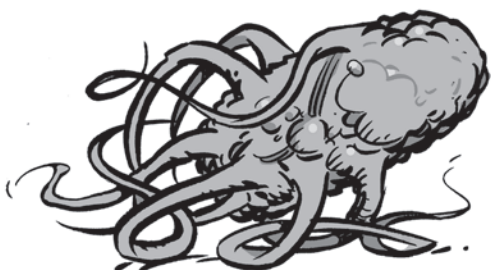
**BY THE END OF THIS UNIT,
PARTICIPANTS WILL BE ABLE TO:**

- Define 'microbe' and 'pathogen'
- Give at least one example of each type of microbe and identify their sources
- Explain how spores are produced and the significance of toxins
- List the six conditions under which bacteria can multiply (FATTOM)
- Identify the DANGER ZONE temperatures
 - Give examples of potentially hazardous foods
- Describe the cycle of transmission
- Give examples of direct and indirect transmission



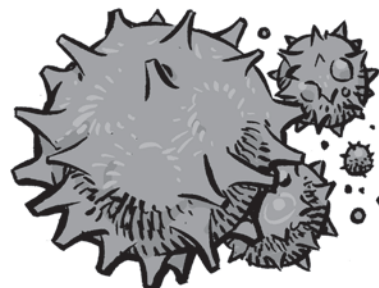
Microbes are living things that are often too small to be seen without the help of a microscope. There are many different types of microbes including bacteria, viruses, parasites, protozoa and fungi. Some microbes are beneficial to us such as some types of yeast, moulds and bacteria that produce foods like yogurt, cheese, sauerkraut, beer and wine; and those that live in our intestines and help us digest food.

Some microbes can cause illness and even death. These microbes are called **pathogens**, which means ‘something that produces sickness’.



Bacteria are all around us. Most bacteria are harmless or even helpful to humans, but some can make us very sick. Pathogenic bacteria such as *Campylobacter*, *E. coli*, *Listeria* and *Salmonella* that can live and grow in food are among the most frequent causes of foodborne illness.

Viruses are smaller than bacteria and frequently cause illness. Viruses that are harmful to humans may be found in contaminated food but will not grow in food. Hepatitis A and the Norovirus are examples of viruses that are transferred from food handlers to food often because of improper handwashing.



Parasites live on or inside another animal or person and are dependent on the host for nutrients. Parasites such as *trichinella* might be found in undercooked pork or other meats, and roundworms might be found in raw fish such as sushi or sashimi.

Protozoa are one-celled animals. An example of protozoa is *Giardia lamblia* that may be found in rivers, lakes, streams and shallow wells. Giardiasis, one of the most frequent causes of non-bacterial diarrhea in North America, may be caused by washing produce in water contaminated with *Giardia lamblia*.



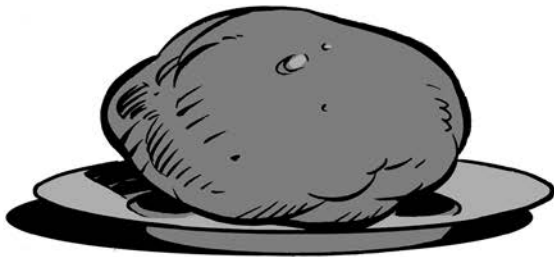
Fungi grow on animals, plants, humans, decaying organic matter, in fact anywhere that is warm and damp. Many fungi are beneficial, but some fungi can spoil foods. It is important to remember that scraping or cutting mould off of food may not make the food safe. The mould may have produced toxins that will remain in the food.

See the Foodborne Illness Chart in Appendix B for common foodborne pathogens.

SPORES AND TOXINS

Some types of bacteria are able to produce a hard coating to protect themselves from stressful conditions such as extreme heat, dryness, cold and chemicals. A bacterium with this protective coating is called a **spore**. Spores can survive high temperatures, drying, boiling, freezing or even chemicals like cleaning agents and disinfectants. When conditions for bacterial growth improve, for example when cooked food containing the spores is removed from the heat and left at room temperature, the spore coating splits open and a normal bacterium emerges and begins to multiply in the food. Spores are a particular concern when food is cooked in advance, allowed to cool too slowly, and then served cold or improperly re-heated later.

EXAMPLE: BOTULISM



RAW POTATO
Contains active *Clostridium botulinum* spores



POTATO IN AIR TIGHT FOIL PROPERLY BAKED
Clostridium botulinum spores survive



WRAPPED BAKED POTATO LEFT IN
THE DANGER ZONE FOR 4 HOURS
Spores germinate, grow and produce toxins



BAKED POTATO EATEN
Toxins cause botulism!

When some bacteria multiply they produce toxins which will make people sick when consumed. Some of these toxins may be destroyed by cooking, but others are heat resistant and will survive even high cooking temperatures. The production of toxins can be controlled by paying close attention to time and temperature when storing and preparing food.

Foods that contain toxins may not look, smell or taste any different from uncontaminated food!

FACTORS THAT AFFECT BACTERIAL GROWTH

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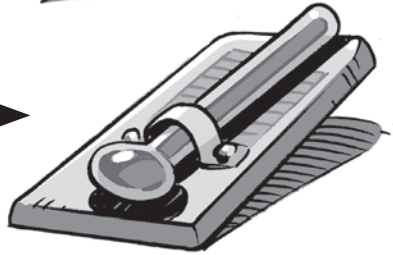
FOOD



ACID



TEMPERATURE



TIME



OXYGEN



MOISTURE



FOOD



Like any living organism, bacteria require food to survive. While some bacteria only need simple nutrients, others require a more complex diet, including protein. Moist foods that are rich in protein such as meat, milk, eggs and fish, are good food sources to support the growth of pathogenic bacteria.

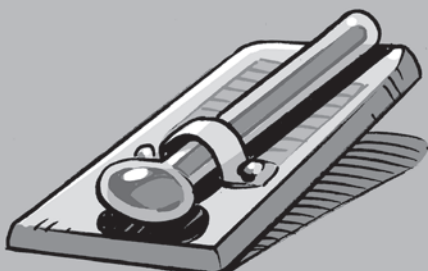
ACID



Bacteria do not grow in an acidic environment, so acidic foods such as lemons and lemon juice, vinegar, and some berries and fruits do not support the growth of bacteria. However, when low acid foods such as vegetables, eggs, meats and soft cheese are prepared, special care needs to be taken to ensure that bacteria cannot grow. Acidity in foods and other substances is measured on a pH scale of 0 to 14, with neutral acidity being 7. The more acidic the food, the lower its number on the pH scale.

ACIDIC			NEUTRAL: HIGHER RISK FOODS										ALKALINE
0-3	3.5	4.0	4.6	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	10-14
 LEMONS ~ 2.6 pH			 STRING BEANS ~ 5.6 pH										 BAKING SODA ~ 9.0 pH
 VINEGAR ~ 3.0 pH			 MILK ~ 6.9 pH										 TONIC WATER ~ 11 pH
 APPLES ~ 3.6 pH			 EGGS ~ 7.3 pH										
			 CAMEMBERT ~ 7.4 pH										
			 FISH ~ 6.9 pH										
			 MEAT ~ 7.0 pH										
			 LOBSTER ~ 7.6 pH										

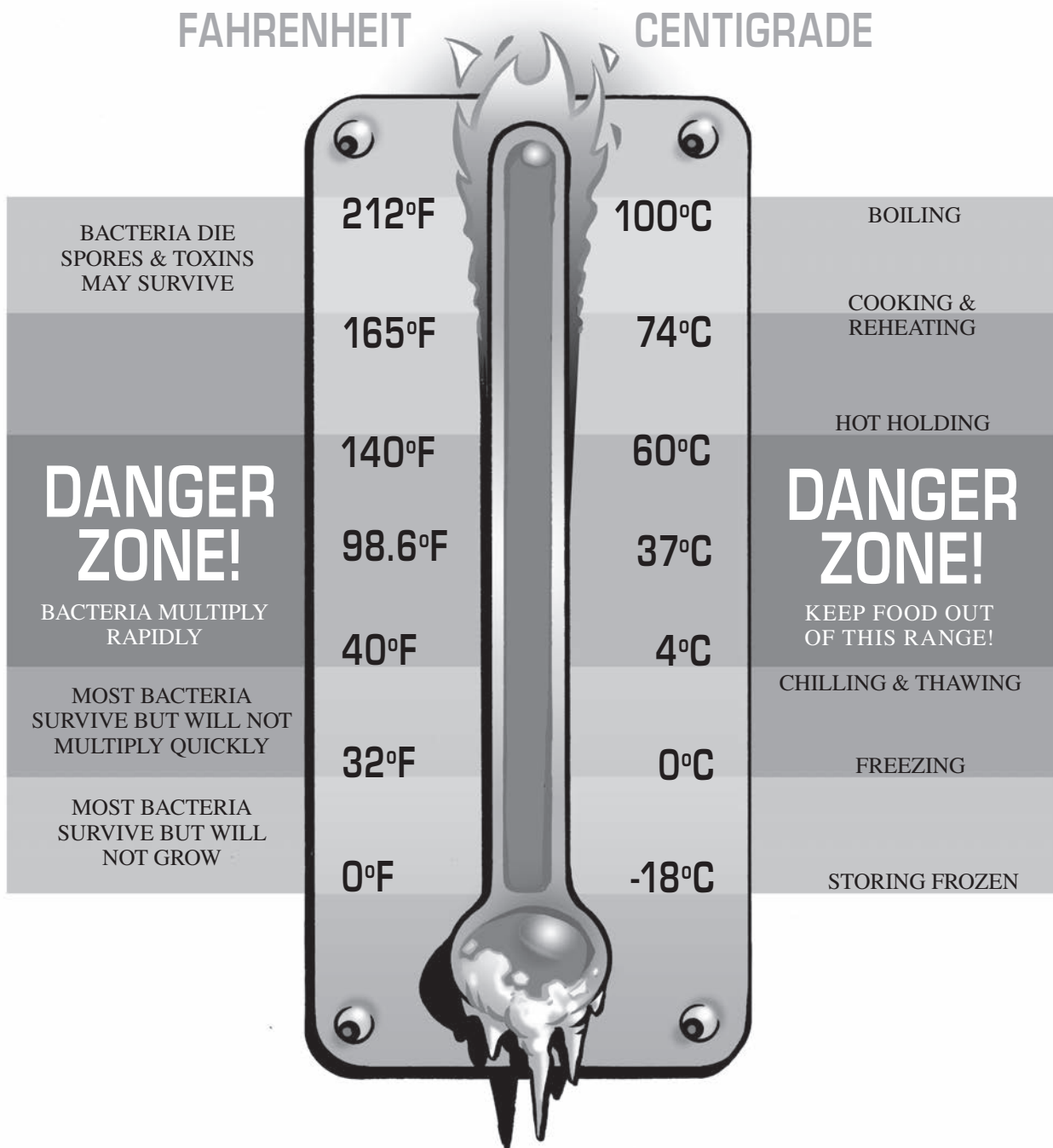
TEMPERATURE



The temperature range between 4°C and 60°C (40°F and 140°F) is referred to as the **DANGER ZONE**, where harmful bacteria can multiply rapidly. Temperatures below 4°C or above 60°C will slow or stop bacteria growth. Temperature control is one of the best ways to reduce the risk of foodborne illness caused by bacteria.

FAHRENHEIT

CENTIGRADE



TIME



Bacteria grow by multiplying. When a small number of pathogens are present in food, the risk is usually low. However, when higher risk foods are left in the **DANGER ZONE** those pathogens multiply rapidly. Restricting the amount of time that foods are left in the **DANGER ZONE** will help to reduce the risk.

12:00



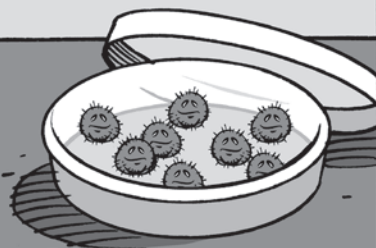
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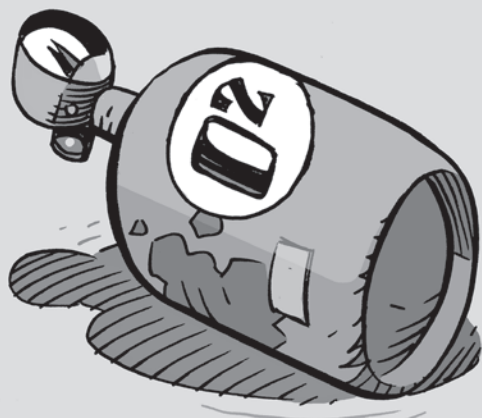
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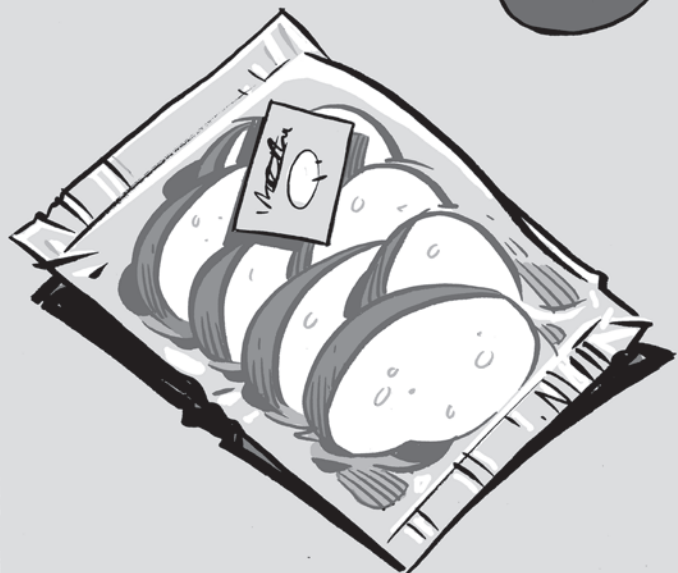


OXYGEN



When foods are improperly processed and then stored at room temperature in air tight conditions such as cans, bottles, vacuum packaging or immersed in oil, anaerobic spores may survive and grow.

Aerobic bacteria require oxygen to grow. **Anaerobic** bacteria grow only when no oxygen is present. Most bacteria that can cause food borne illness are aerobic, however some very dangerous bacteria thrive only in anaerobic, oxygen-free environments. One notable anaerobic bacterium is *Clostridium botulinum* that causes botulism.



Vacuum packaging can help to extend the shelf-life and quality of food by removing oxygen, but it is important to remember that some bacteria do not require oxygen for growth. Therefore, vacuum packaging does not eliminate the need for food to be kept at proper storage temperatures. Most vacuum packed food must be kept out of the **DANGER ZONE**. This is particularly critical for foods such as luncheon meats and smoked fish that are often served without additional cooking.

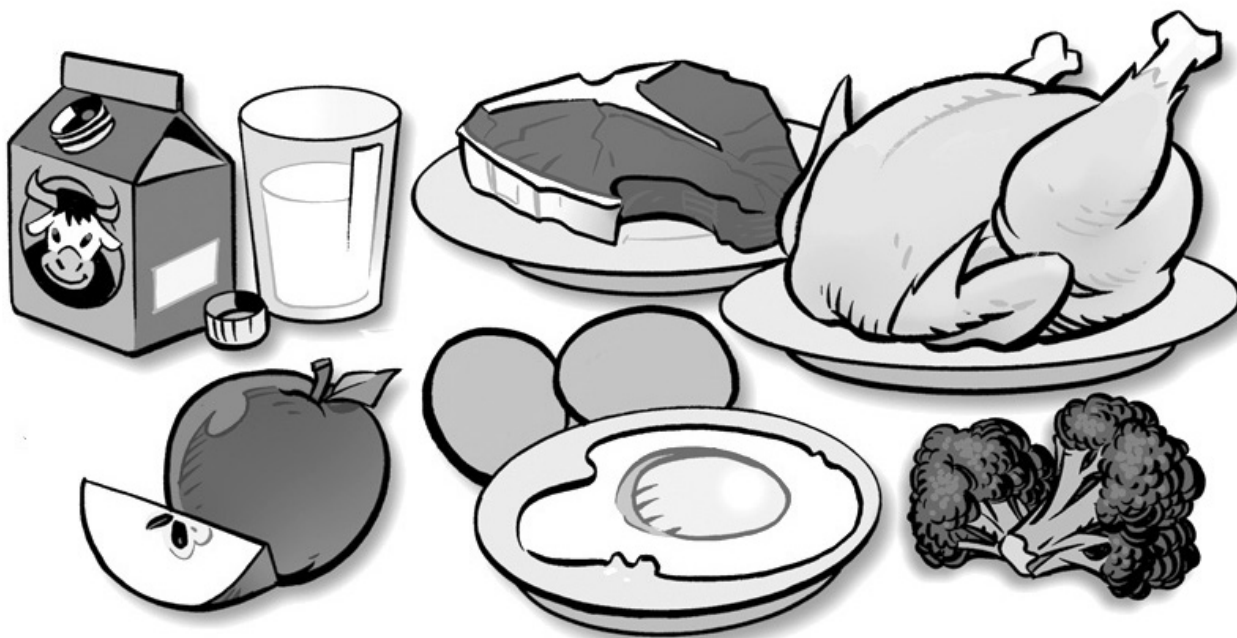
MOISTURE



Bacteria need moisture to survive. Bacteria, yeast and moulds grow rapidly in food with a high moisture content such as meat, produce and soft cheeses. Dry, sweet or salty foods such as uncooked rice and pasta, crackers and candies have a lower moisture content and are less hazardous.

POTENTIALLY HAZARDOUS FOODS

Foods that have the **FATTOM** conditions to support the growth of pathogens or the production of toxins are considered **potentially hazardous foods** that pose a food safety risk if left in the **DANGER ZONE** for even short periods of time. Some examples of potentially hazardous food are meats and poultry, eggs and egg products, dairy products, fish and shellfish, cooked and cut up raw fruits and vegetables, and many processed foods.



EGGS: HANDLE WITH CARE!
See Unit 6 for instructions on handling eggs.

There are three major parts in the cycle of transmission of contaminants: the food, the food handler, and the environment. Some foods already contain pathogens- a good example is *Salmonella* in raw chicken. Foods can also become contaminated by an infected food handler; or by environmental factors such as unclean work surfaces and utensils, insects and pests, or a dirty water or air supply; or by cross-contamination from some other contaminated food. Similarly, a food handler can become contaminated by touching or tasting contaminated food. The environment may be contaminated by both food handlers and contaminated food. The transmission of foodborne illness can be ‘a vicious circle’!

CYCLE OF TRANSMISSION OF CONTAMINANTS



FOOD HANDLER



ENVIRONMENT



FOOD

Direct transmission occurs when microbes transfer directly from the source of contamination to food.



For example, when contaminated raw meat juices drip onto fresh produce...



...or when an infected food handler coughs or sneezes onto food or touches the food with contaminated hands.



To reduce the risk of direct transmission of foodborne illness, food handlers should always pay close attention to personal hygiene and proper food storage.



Indirect transmission is also called **cross contamination**, and occurs when there is an intermediate step between the source of contamination and the food.



For example, **cross contamination** might occur when a cutting board is used to cut up raw chicken and then is used again to prepare salads without being cleaned and sanitized.

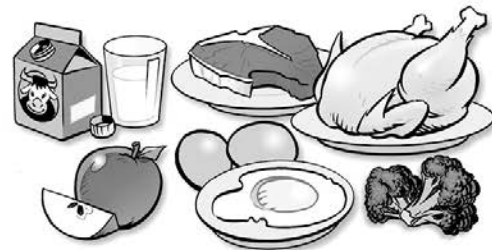


This unit sets the context for the remaining units in FOODSAFE Level 1 by introducing Food Safety Plans (FSP) emphasizing Critical Control Points (CCPs), and explaining how a food handler can reduce the risk of contamination at each step in an FSP by following proper sanitation and food handling practices.

LEARNING OUTCOMES

**BY THE END OF THIS UNIT,
PARTICIPANTS WILL BE ABLE TO:**

- Describe the purpose of food safety plans
- Define hazards, critical control points (CCPs), critical limits, monitoring actions and corrective actions
- Give examples of CCPs for ready to eat foods and foods that will be cooked



Food service establishments should have written plans for the safe preparation of each menu item in the establishment. These plans are called **Food Safety Plans (FSP)**. Food safety plans are part of a **Hazard Analysis Critical Control Points (HACCP)** program, a systematic approach to product safety that is widely used in the food industry. An FSP begins at the receiving and storage stage, when food enters the establishment, until the point when it is served to the customer. When all food handlers follow the FSPs for the foods served in an establishment, the risk of food contamination will be reduced. An FSP identifies Hazards, Critical Control Points, Critical Limits, Monitoring Actions and Corrective Actions.

HAZARDS

An FSP begins by identifying the possible biological, physical, and chemical hazards associated with each step in the preparation and serving of a menu item. In the food service industry, biological hazards are by far the most common type of hazard.



BIOLOGICAL



PHYSICAL



CHEMICAL

CRITICAL CONTROL POINTS

In a Food Safety Plan, a **Critical Control Point (CCP)** is a point beyond which no further action can be taken to eliminate a hazard. In other words, a CCP is either a 'kill step', the step at which the hazard is eliminated, or a 'control step', the step at which the hazard is controlled. For foods such as raw meats, poultry, seafood and eggs, a CCP is the cooking step when the temperature of the food is raised to a high enough temperature to kill bacteria. For foods such as fresh salad ingredients or ready-made sandwiches, a CCP is the storage step when the food is stored away from potentially hazardous foods and at a temperature low enough to control bacterial growth.

KILL STEP!

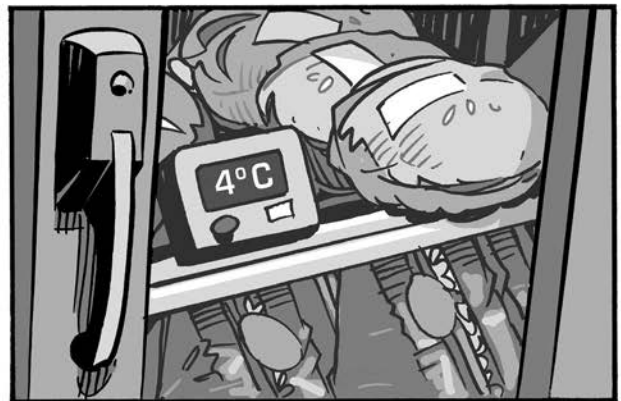
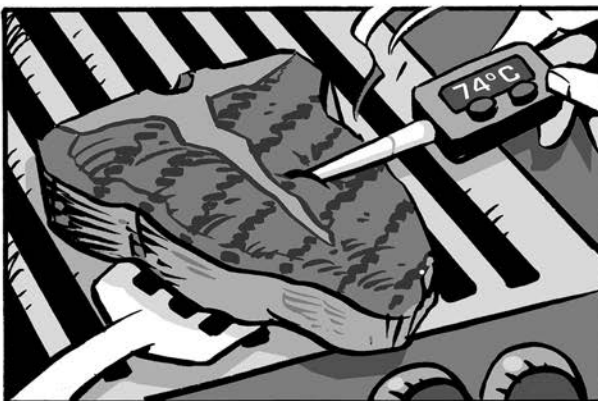


CONTROL STEP!



CRITICAL LIMITS

Critical Limits are specific and measurable limits that indicate effective control of a critical control point. In the above examples, the critical limit for the cooking step is to cook meat to at least 74° C, and the critical limit for ready-made sandwiches is to store them at or below 4° C.



MONITORING ACTIONS

Monitoring Actions are checks, measurements or observations that prove that the critical limit is met. These actions might include checking the internal temperature of hamburger patties at the end of the cooking time, or checking the temperature of the sandwich display cooler every two hours. Monitoring actions should be documented and accurate records kept.



CORRECTIVE ACTIONS

Corrective Actions are procedures that should be followed when a critical limit has not been met. For example, if the internal temperature of a hamburger patty is only 62° C at the end of the cooking time, the corrective action is to continue cooking the patty until it reaches 74° C. Corrective actions should be documented and accurate records kept.



PROCESS-BASED FOOD SAFETY PLAN: Breakfast Buffet Items

Step	Hazard	CCP?	Critical Limit	Monitoring Action	Corrective Action
Receiving	Biological: pathogen growth, toxins parasites Physical: packing materials	N	Received from an approved supplier; temperature control during transport <4°C; goods and containers in good condition	Ensure supplier is an approved source; check temperature and condition of received foods	Reject shipment if not from an approved source, or if temperature of the transport cooler and goods are over 4°C, or if packages are damaged
Storage	Biological: pathogen growth, toxins, parasites	N	Store in cooler between 0°C and 4°C	Check cooler at least twice per day	If the cooler is above 4°C for less than two hours, transfer food to a working cooler that is below 4°C If the cooler is above 4°C for more than two hours, discard food
Preparing	Biological: contamination from handlers	N	Use clean hands or sanitized utensils. Do not work when sick.	Visual observation; hands washed properly and frequently; do not allow sick employees to handle food	Modify procedure (provide sanitized utensils); discard contaminated food; send sick workers home
Cooking	Biological: pathogen survival	Y	Cook food to 74°C	Measure and record temperature at the end of cooking	If food has not reached 74°C, continue cooking until it has reached 74°C
Hot Holding	Biological: pathogen growth	Y	Hot-hold food above 60°C	Measure and record temperature of food every two hours using a stem thermometer	If the food is below 60°C for less than two hours, transfer food to another container and reheat to 74°C, then hot-hold at 60°C If the food is below 60°C for more than two hours, discard food
Serving	Biological: contamination from handlers	Y	Use clean hands or sanitized utensils. Do not work when sick.	Visual observation; hands washed properly and frequently; do not allow sick employees to handle food	Modify procedure (provide sanitized utensils); discard contaminated food; send sick workers home

PROCESS-BASED FOOD SAFETY PLAN: Pre-made Sandwiches

Step	Hazard	CCP?	Critical Limit	Monitoring Action	Corrective Action
Receiving	Biological: pathogen growth, toxins, parasites	Y	Received from an approved source; temperature during transportation <4°C	Ensure supplier is an approved source. Check temperature of cooler in delivery vehicle and temperature of received goods.	Reject shipment if not from an approved source, or if temperature of the transport cooler and goods are over 4°C
Storage	Biological: pathogen growth, toxins, parasites	Y	Store in cooler between 0°C and 4°C	Check cooler and sandwich temperature every 2 hours	If the cooler is above 4°C for less than two hours, transfer food to a working cooler that is below 4°C If the cooler is above 4°C for more than two hours, discard food

Note that with sandwiches that are purchased pre-made, there is no cooking step to kill pathogens. Therefore, receiving and storage are CCPs. Proper refrigeration is the only way to control pathogen growth.

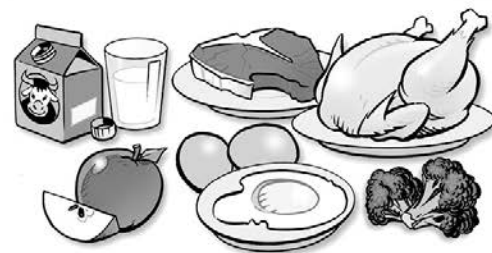


This unit emphasizes that food handlers are a primary source of food contamination and that by following proper health and hygiene practices all food handlers can help to reduce the risk of foodborne illness outbreaks.

LEARNING OUTCOMES

BY THE END OF THIS UNIT, PARTICIPANTS WILL BE ABLE TO:

- Describe the importance of good health and hygiene habits for food handlers
- Identify the steps in proper hand washing
- Describe the appropriate use of gloves
- List good personal habits that could reduce the risk of foodborne illness
- Explain the importance of not handling foods when sick



Food handlers are one of the three components in the Cycle of Transmission, so practicing good personal hygiene is one of the most important steps in the prevention of foodborne illness. Even if you are not displaying any symptoms of illness, you could still be a carrier, which means you could be carrying pathogens in or on your body.

Frequent and proper hand washing is an important step in preventing the spread of foodborne illness and gastrointestinal disease. Always wash your hands before you begin handling food and after eating, smoking, sneezing, coughing, blowing your nose, using the toilet, touching your hair or face, handling garbage, or handling money. Fingernails should be kept well trimmed and cleaned using a clean and sanitized nailbrush. Remove jewelry and nail polish.



CYCLE OF TRANSMISSION OF CONTAMINANTS



FOOD HANDLER

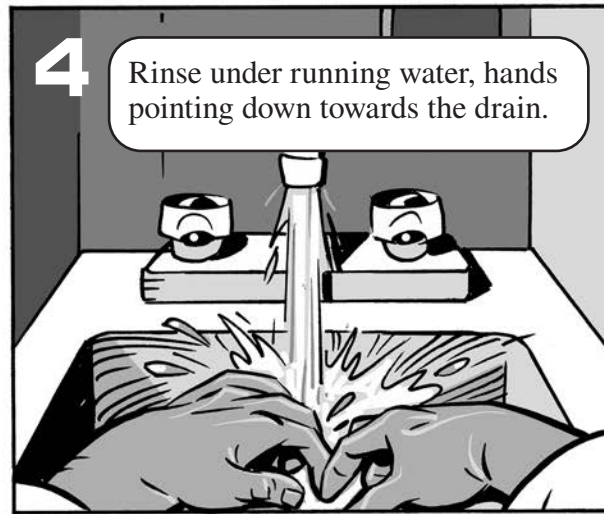
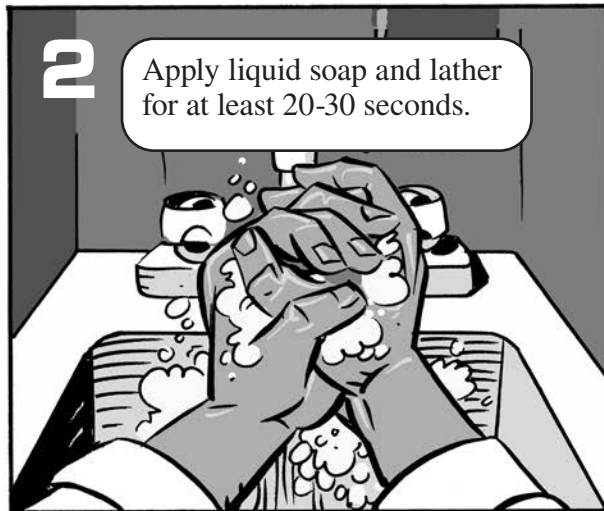


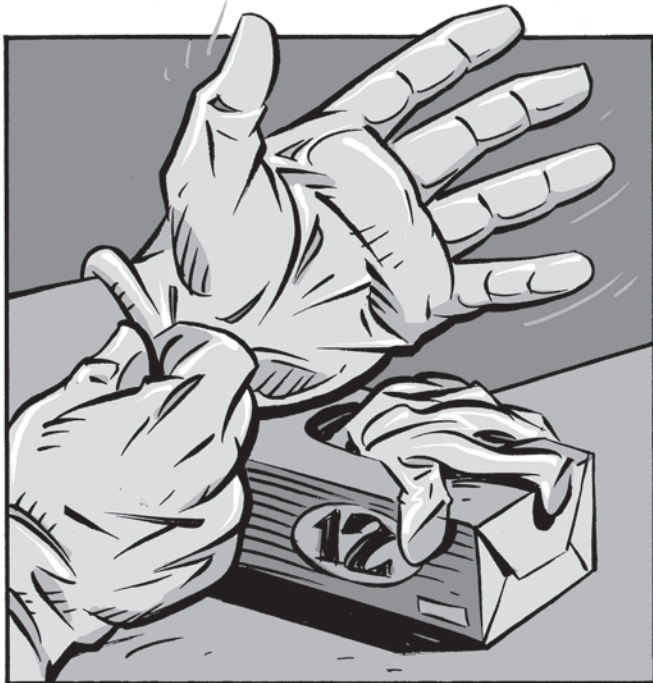
ENVIRONMENT



FOOD

STEPS FOR PROPER HAND WASHING





Disposable gloves can provide an extra barrier of protection between hands and food--but remember that gloves pick up bacteria just like your hands!

Wash your hands thoroughly before putting on disposable gloves, and change them as often, and in the same circumstances, as you would wash your hands.

DO NOT USE LATEX GLOVES!
 Latex is a common allergen and can cause severe allergic reactions. The recommended materials for disposable gloves are nitrile, polyethylene or vinyl.

PERSONAL HYGIENE

Wash your hands thoroughly after contact with any possible contaminant.



Alcohol-based hand gels may be used as an alternative to hand washing **ONLY** by health care personnel working in a health care setting. These products are **NOT** a suitable alternative to hand washing for food handlers in a food service premises.



Change from street clothes to clean work clothes and footwear before starting work.



Change your uniform and apron as often as necessary. Always remove your apron before going to the washroom.



Avoid wiping your hands on your apron or clothing when you are working with food.



Restrain your hair with a hat, hairnet, or hair elastic. Wash your hands after touching your hair, beard or mustache.



Avoid touching your mouth or nose when working with food.



Avoid smoking, eating or engaging in other activities that put your hands in contact with your mouth.



When tasting food, use a single-use utensil or use a new, clean utensil for each tasting.



Infected food handlers are a significant cause of foodborne illness outbreaks. A sick food handler can transmit illness to co-workers and customers with serious or even deadly results. If you have an illness that might contaminate food, you must stay home from work.

If you are experiencing symptoms such as nausea, vomiting or diarrhea, or if you have open cuts or sores, you must not handle food. Be sure that you are familiar with your establishment's employee sickness policy. The operator has a legal responsibility to prohibit ill employees from handling food.



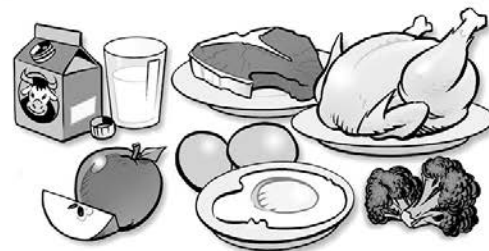
In most foodservice operations, only a few people have the direct responsibility for receiving and storing food.

However, it is important for everyone, regardless of their position, to understand the proper procedures in order to maintain overall food safety control and assist in identifying and preventing problems.

LEARNING OUTCOMES

**BY THE END OF THIS UNIT,
PARTICIPANTS WILL BE ABLE TO:**

- Explain the importance of using only approved sources for food
- List reasons why a product or shipment might be rejected
- List the proper procedures for receiving a food delivery
- List the order in which foods should be put away
- Explain the FIFO principle
- Describe safe procedures for storing food



RECEIVING FOOD

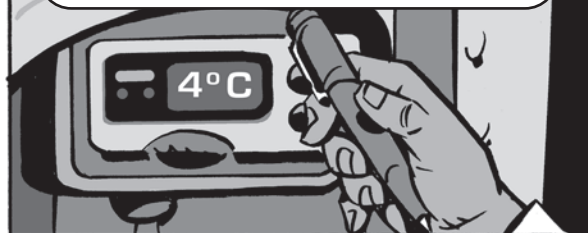
Only accept food shipments from approved sources, and check that the delivery vehicle is clean. Reject shipments if the vehicle is dirty or if there is evidence of pests. Ensure you have adequate storage space for food. Don't order more than you can use in a reasonable time.



Ensure that chemicals have been stored separately from food and food containers on the vehicle. Check for spillage and leakage.



Check that the refrigeration and freezer units on the vehicle are at the correct temperatures: at or below 4°C (40°F) for refrigeration units and at or below -18°C (0°F) for freezer units.



Using a probe thermometer, check that the internal temperature of refrigerated food is at or below 4°C (40°F) and frozen food is at or below -18°C (0°F).



Do not accept food that is spoiled, damaged, or past its 'best before' date. Reject products with broken boxes, torn bags, opened containers, dented cans, or strange odours.



RECEIVED FOODS SHOULD BE PUT AWAY IMMEDIATELY IN THIS ORDER:



1st: potentially hazardous foods requiring refrigeration (meats, seafood, dairy, etc.)



2nd: frozen foods



3rd: less hazardous foods that require refrigeration (fresh, uncut fruits and vegetables, etc.)



4th: dry goods

STORING FOOD

Use the 'first in, first out' (FIFO) principle. Pull older stock to the front of the shelf and store the new stock behind. Note the code date on products: 'best before' date, 'expiry' date, 'use by' date or 'production date'; and rotate stock so that older stock is used before new stock. Discard expired products.



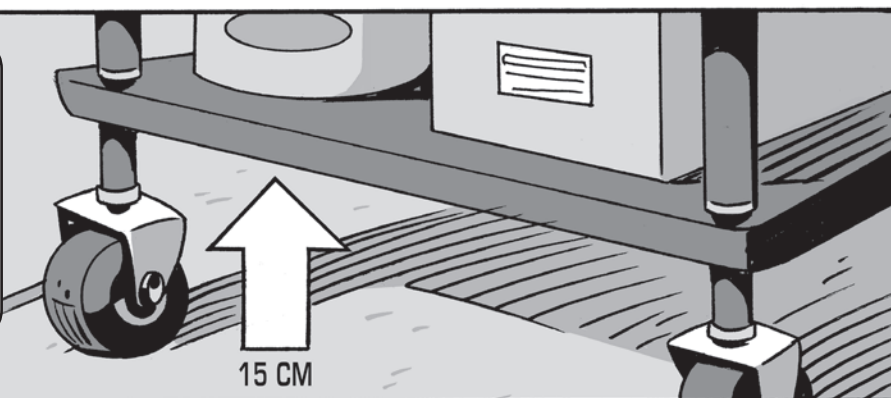
Protect food from contamination by wrapping and covering it.
 Use only food-grade containers to store food.
 Do not re-use empty containers to store food.



Make sure that all food is labeled with the product name and the date that it was received.



Do not store food on the floor.
 All food should be stored at least 15 cm (6 in) off of the floor.



Always store raw animal foods on the bottom shelf in the cooler below ready to eat foods (any foods that will not be further cooked).



**OYSTERS AND SHELLFISH:
 HANDLE WITH EXTRA CARE!
 See Appendix C**

Preparing Food Safely

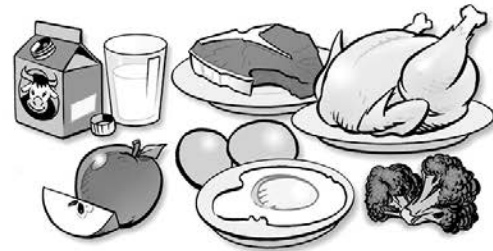
Foods that have the FATTOM conditions to support the growth of pathogens are potentially hazardous foods and require special care during the preparation stage. Steps need to be taken to avoid cross-contamination, and careful attention needs to be paid to time and temperature rules.



LEARNING OUTCOMES

BY THE END OF THIS UNIT, PARTICIPANTS WILL BE ABLE TO:

- Describe proper procedures for thawing frozen foods
- Explain methods to prevent cross-contamination when preparing foods
- Explain the importance of cooking foods to the correct temperature
- Demonstrate how to use a food thermometer
- Describe safe procedures for hot holding foods
 - Explain the importance of proper cooling and methods for rapidly cooling foods
 - Describe proper procedures for re-heating foods



THAWING

Most bacteria will not grow in frozen foods, but they will begin to multiply again when food is thawed and left in the DANGER ZONE. There are three safe ways to thaw food:

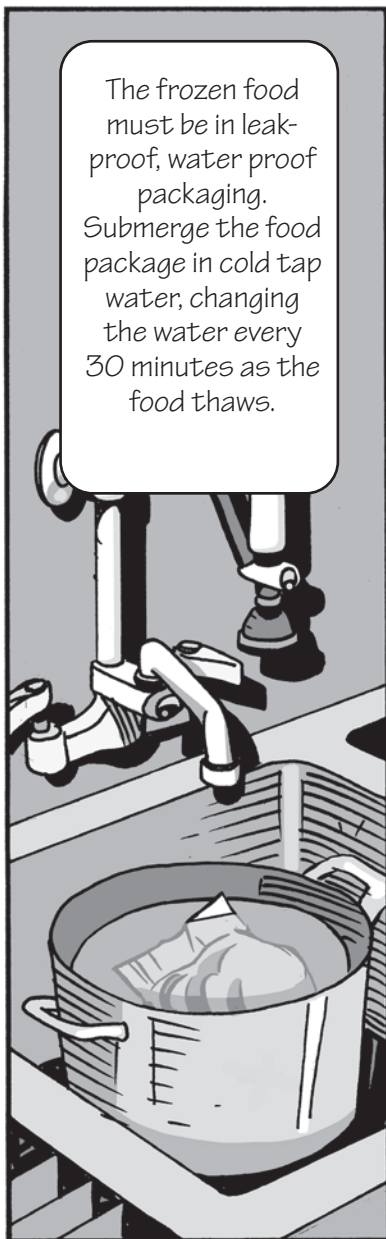
IN THE REFRIGERATOR:

At or below 4°C (40°F). Large frozen items like a roast will take at least 24 hours for every 2.5 kilos. Even small amounts of frozen food require a full day to thaw in the refrigerator.



IN COLD WATER:

The frozen food must be in leak-proof, water proof packaging. Submerge the food package in cold tap water, changing the water every 30 minutes as the food thaws.



IN A MICROWAVE:

A microwave oven may be used to thaw small quantities of food, but remember that microwave ovens do not thaw food evenly.



Small quantities of food can be cooked from a frozen state, but they will take longer to cook than the recommended time for fully thawed foods. Always check that food has reached a safe internal temperature before ending the cooking step.

NEVER THAW FOOD AT ROOM TEMPERATURE!

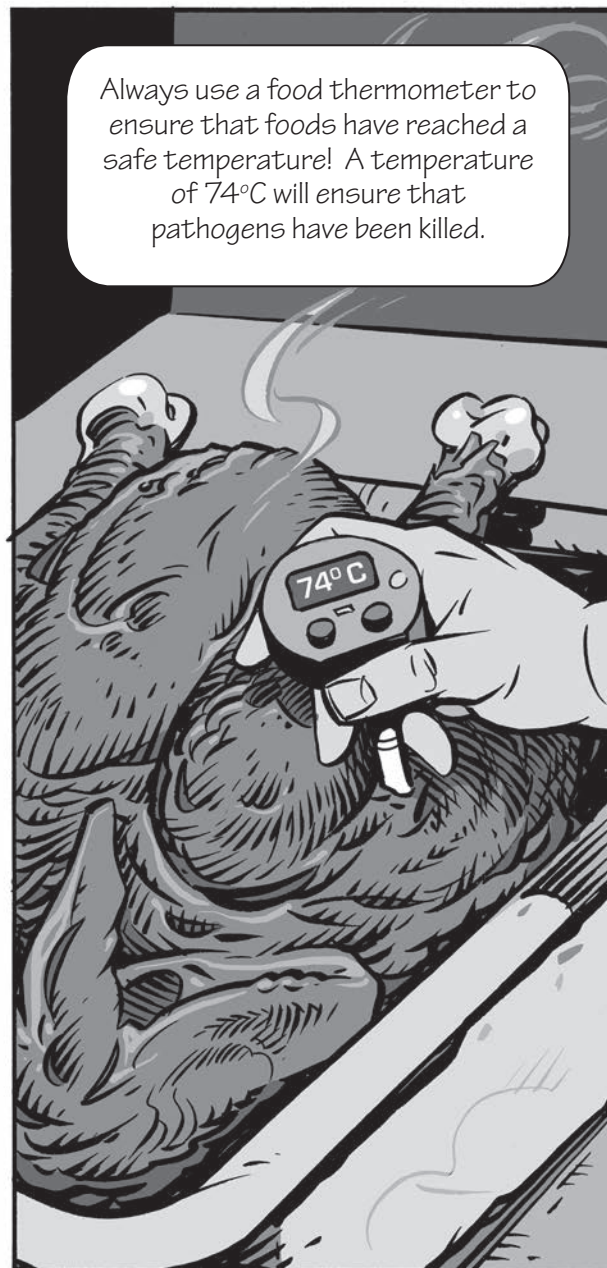
PREVENTING CROSS-CONTAMINATION

TO REDUCE THE RISK OF CROSS-CONTAMINATION DURING FOOD PREPARATION:



COOKING TO THE CORRECT TEMPERATURE

The cooking step for many potentially hazardous foods is a **Critical Control Point**. Cooking to the correct temperature is the Critical Limit, or the point at which pathogens will be killed. In order to be sure that foods have reached the Critical Limit temperature, always use a food thermometer to check the internal temperature of the food.



Temperature logs may be found on the **FOODSAFE** website at foodsafety.ca.

HOW TO USE A FOOD THERMOMETER

Food thermometers should be calibrated frequently to ensure that they are reading temperatures correctly, and must be cleaned and sanitized after each use.



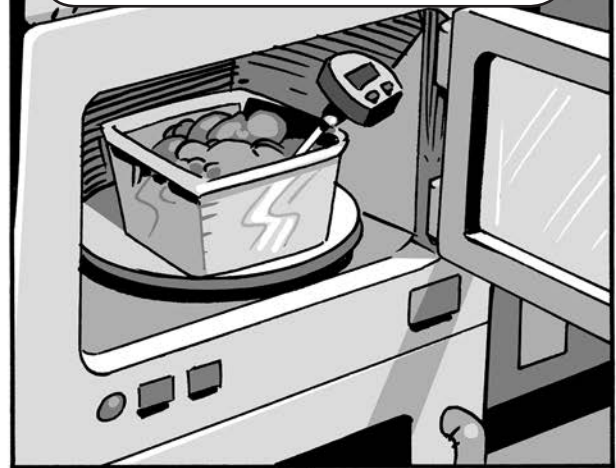
Use where the coldest temperature is most likely, such as the thickest part of a piece of meat or poultry, or the middle of a pot of soup. Make sure that the thermometer is not touching a bone and take the temperature in several places.



Be aware of hot and cold spots on grills, stoves or ovens and measure food that is most likely to be colder.



When microwaving foods, be aware that they will not cook evenly; check temperatures in different parts of solid food and stir liquids for more accurate temperature readings.



See Appendix D for instructions on how to calibrate thermometers.

HOT HOLDING FOODS

Hot holding equipment such as chafing dishes, steam tables, crock pots, and rice cookers are specifically designed to keep food at a safe temperature between when it is cooked and when it is eaten.

Hot holding units hold food at a temperature at or above 60°C (140°F); they are NOT designed to heat food to a safe temperature!

Both the hot holding unit and the food must be preheated before the food is placed in the unit.



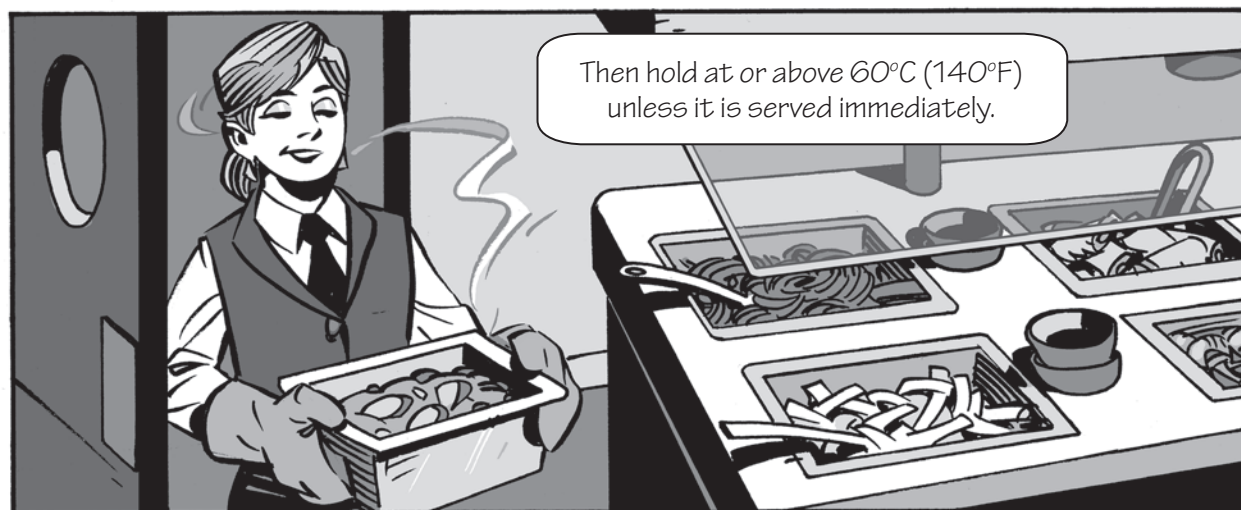
COOLING FOODS

Improper cooling is one of the leading causes of foodborne illness. In order to reduce the amount of time that food remains in the DANGER ZONE, hot food must be cooled from 60°C to 20°C (140°F to 70°F) within two hours, and then cooled from 20°C to 4°C (70°F to 40°F) within the next four hours.



RE-HEATING FOODS

Inadequate reheating for hot holding is one of the improper food handling practices that have caused foodborne illness outbreaks.



PUTTING IT ALL TOGETHER

A SPECIAL CASE: POULTRY PRODUCTS – *Campylobacter* and *Salmonella*



Poultry products, both meat and eggs—including turkey, duck, goose, and especially chicken products (see the next page for information on eggs), deserve special mention when talking about microbes and preventing foodborne illness.

Campylobacter and *Salmonella* cause the most cases of bacterial foodborne illness in Canada—they are first and second with respect to the number of foodborne illness cases they cause. More people are hospitalized because of *Campylobacter* and *Salmonella* than all the other foodborne illness-causing bacteria combined.

Raw poultry is often contaminated with *Salmonella* and *Campylobacter* bacteria. In a study that tested several hundred skinless chicken breast samples from across Canada, *Campylobacter* was found 44% of the time and *Salmonella* 21% of the time. The same study also looked at processed chicken products—specifically raw and uncooked, frozen chicken nuggets. *Salmonella* was found on these products 28% of the time.

While proper food and meat handling practices are presented throughout FOODSAFE Level 1, the following tips are especially important to prevent people from getting sick from *Campylobacter* and *Salmonella* in raw poultry:

- **Make sure** the poultry is packaged and stored in such a way that the raw juices cannot drip onto other foods. **Never store** raw poultry products above foods that are eaten raw, such as lettuce, or foods that won't be further cooked, such as bread.
- **Keep poultry cold** until just prior to preparation and cooking. Make sure your cooler is set at 4°C or colder and your freezer is set at -18°C or colder.
- **Never rinse** raw poultry before using it because the bacteria can spread everywhere the water splashes, creating even more of a food safety hazard. The raw poultry has already been washed and rinsed at the slaughterhouse.
- **Use a separate cutting board** for products that are ready to eat such as lettuce or cheese, and a different one for raw poultry and raw meat. Using different coloured cutting boards will help people remember which board to use and will reduce the risk of cross-contamination. For example, use a green one for produce and a red one for poultry and meat.
- **Always wash your hands** after handling raw poultry and before you do anything else in the kitchen.
- **Always wash and sanitize** any utensils and work areas that were used for raw poultry before using them for anything else.
- **Always cook poultry** to at least 74°C or hotter—internal temperature. These temperatures will kill any *Campylobacter* and *Salmonella* found in raw poultry. Use a meat thermometer to measure the cooking temperature—don't just guess. The colour of the meat or juices is not a good way to measure whether meat has been properly cooked.
- **If you are stuffing a bird**, make sure the stuffing is also cooked to 74°C or hotter.

PUTTING IT ALL TOGETHER

EGGS: HANDLE WITH CARE!



Eggs are a potentially hazardous food and can be contaminated with *Salmonella*. *Salmonella* is a major cause of foodborne illness and eggs are one of the most likely sources.

You cannot tell by sight, smell or taste whether an egg is contaminated with *Salmonella*. Both the inside and outside of the egg can be contaminated so handle eggs the same way you would handle raw poultry.

The only way to kill *Salmonella* in eggs is to properly cook them. Cooking eggs or foods containing eggs to 74°C (165°F) or hotter will kill *Salmonella*. When an egg has been safely cooked, the yolk is hard, not runny.

SAFE HANDLING OF EGGS

RECEIVING:

- Only buy graded eggs from an approved supplier.
- Only buy eggs that are clean, uncracked, and refrigerated. Never buy or use dirty or cracked eggs.
- Only buy and use eggs that have time left on their “Best Before Date.” Don’t use eggs that have expired.

STORING:

- Always store eggs in a refrigerator at 4°C (40°F) or colder until just before you use them.

POOLING EGGS:

- Pooling eggs is the breaking and combining of multiple (more than one) eggs into a container. The pooled eggs can then be mixed together or remain unmixed. While only a small percentage of eggs are contaminated with *Salmonella*, the pooling of eggs can spread contamination from just one egg to the entire batch of pooled eggs. For this reason, pooling of eggs is risky and must be done carefully.

CLEANING AND HYGIENE AFTER HANDLING EGGS

- Hands must be washed thoroughly for 20–30 seconds with soap and warm water immediately after handling eggs.
- Thoroughly wash and sanitize containers, equipment, dishes, utensils and food contact surfaces that held or touched uncooked eggs or foods containing eggs that have not yet been cooked, before using them again.

Serving food includes such tasks as displaying food in coolers and self-serve units; table service; clearing and setting tables; delivering food off-site; and even sending leftovers home with guests. In this unit, we will look at ways to reduce the risk of food contamination when serving food.

LEARNING OUTCOMES

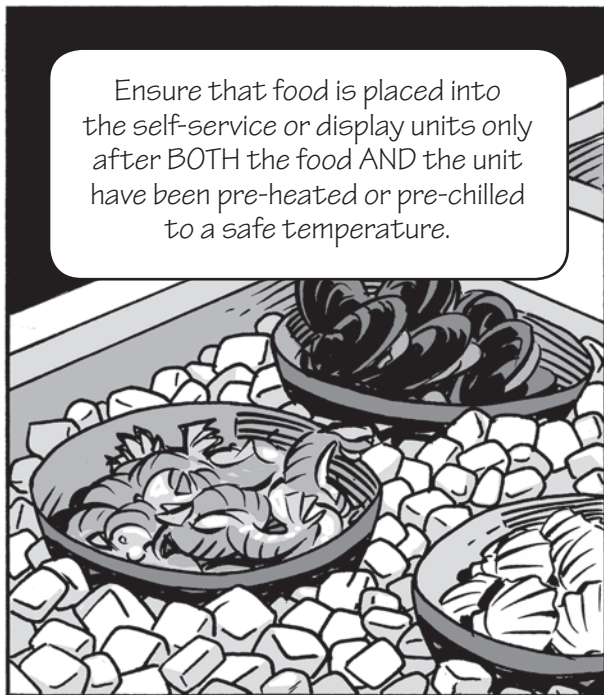
**BY THE END OF THIS UNIT,
PARTICIPANTS WILL BE ABLE TO:**

- Describe methods to reduce the risk of contamination in self-service and buffet situations
- List methods of dispensing and serving food safely
- Describe proper procedures for clearing and setting tables
- Give examples of service items that are meant to be used only once
- Follow safe procedures when transporting food off premises for catering or home delivery



SELF-SERVICE AND BUFFETS

In self-service situations such as buffets and salad bars, food may be contaminated because of issues with time and temperature and through customer contact with the food. Some methods to reduce the risk in self-service situations include:





Remind guests to use a clean, fresh plate when returning to the self-service line.



Never add fresh food to food that has been sitting in the buffet table. Food that has been on a self-service table must not be re-used.

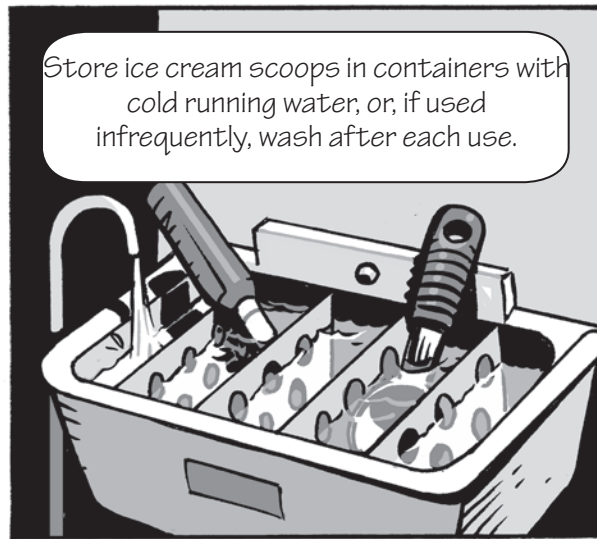


Children should be supervised by an adult when at the self-service line.



Limit amount of displayed food to what can be used within two hours.

SERVING FOOD



CLEARING AND SETTING TABLES

Food that has been served but not eaten must be discarded.



Use a clean, damp cloth or paper towel and a spray sanitizer to clean tables between uses.



Table linens should be changed between each setting, and tables must be cleared completely after each use. Even if a guest only has a coffee and does not use the cutlery, the entire setting must be removed when the guest leaves.





Glasses and cups should be inverted on clean placemats or saucers to reduce the risk of contamination.

Handle glasses by their base, and cutlery by the handle when setting tables.

If leaving tables set, cutlery should be wrapped to reduce the risk of contamination from dust and dirt.

SINGLE SERVICE ITEMS

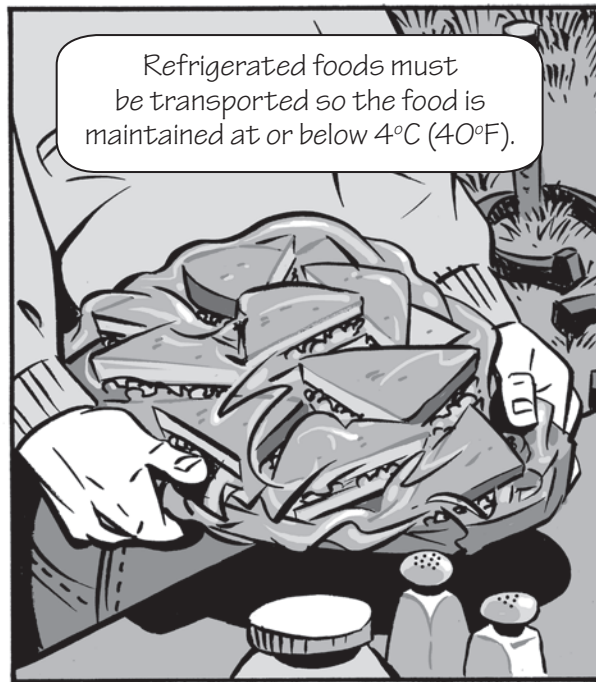
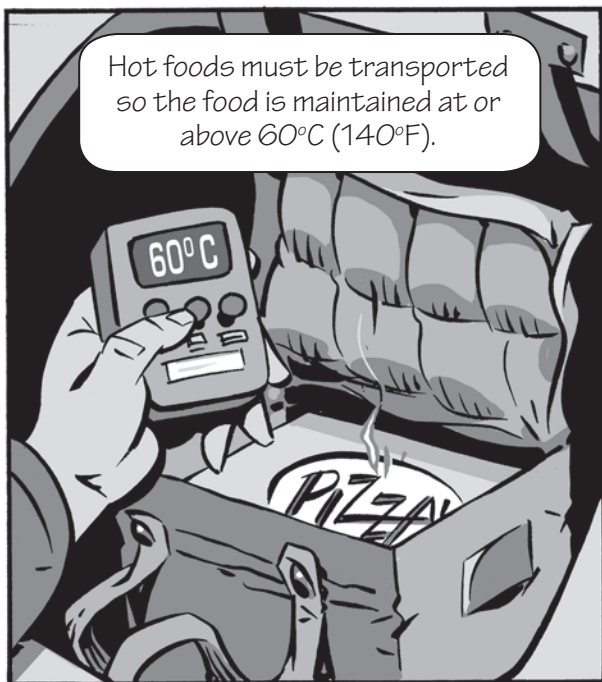
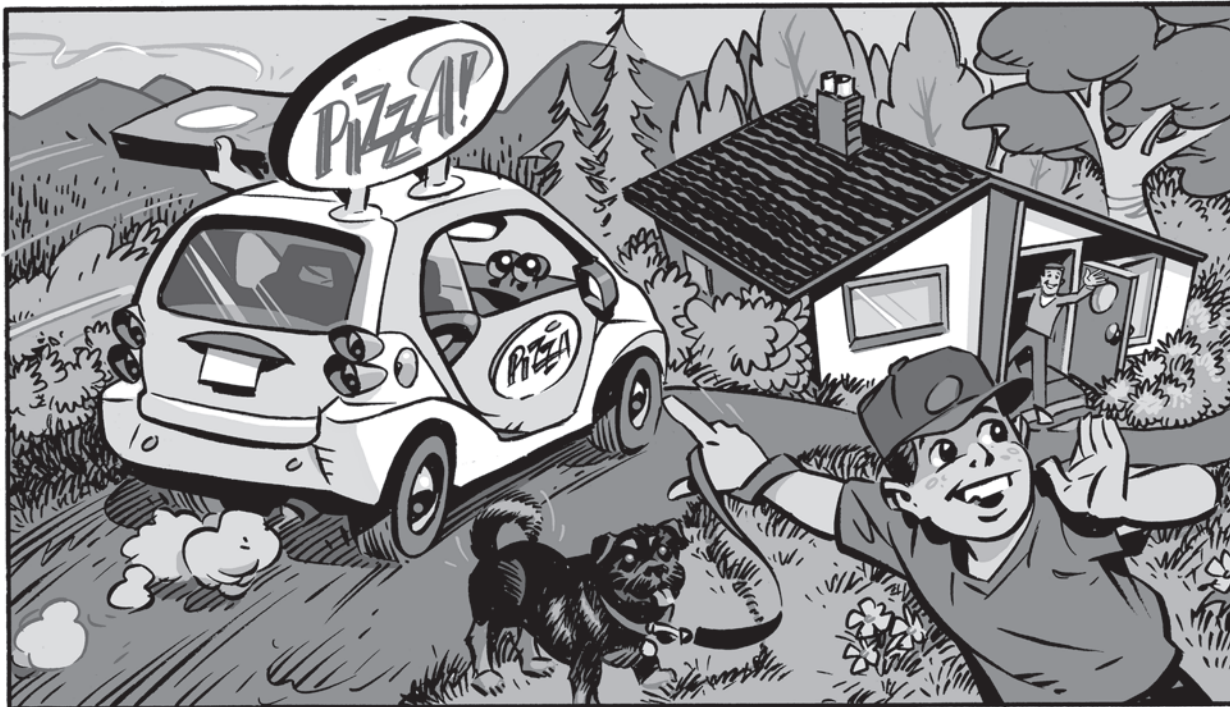


TAKING AWAY LEFTOVERS



CATERING AND DELIVERY

Food that is being transported off premises must be covered and protected from contamination. The food must leave the premises and arrive at its destination at a safe temperature.



In a culture of food safety, everyone in the establishment, regardless of their role, should be aware of the basic principles of cleaning, sanitizing and pest control. By understanding these principles, everyone can assist in identifying and rectifying possible problems.

LEARNING OUTCOMES

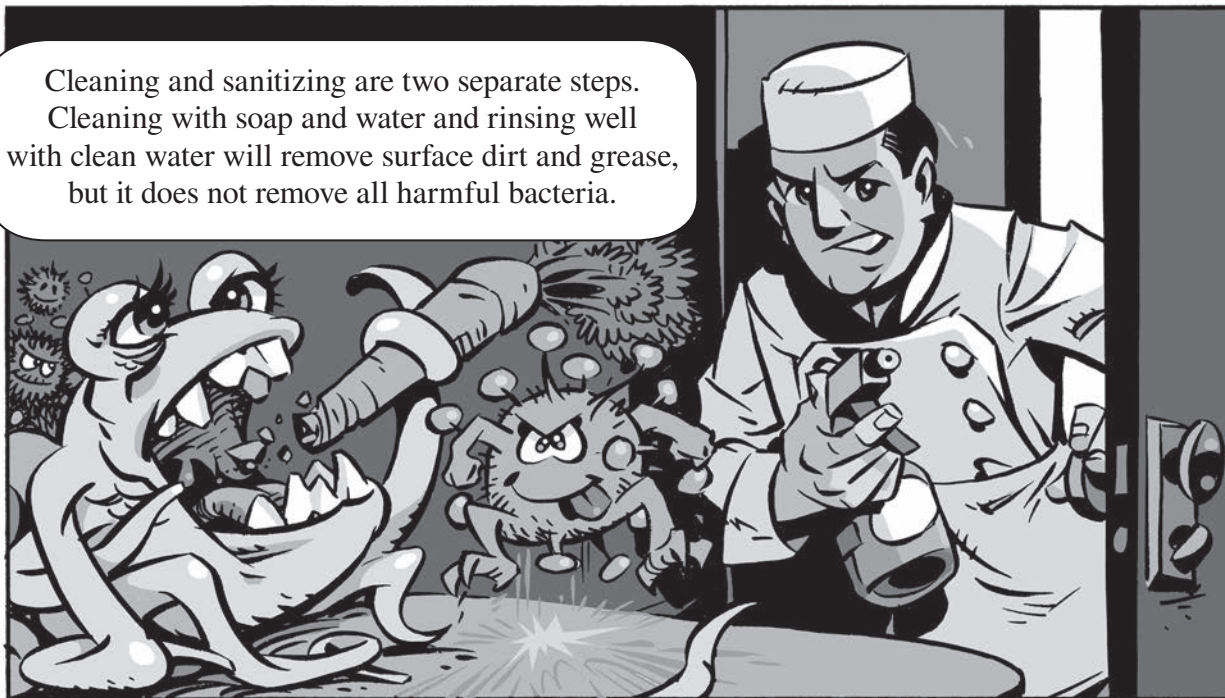
**BY THE END OF THIS UNIT,
PARTICIPANTS WILL BE ABLE TO:**

- List the steps for proper dishwashing
- List correct temperatures for manual and mechanical dishwashing
- Describe how to check dishwasher temperatures and sanitizer levels
- Explain the importance of following a Sanitation Plan
- Identify signs of pest infestations
- List ways to prevent pest infestations

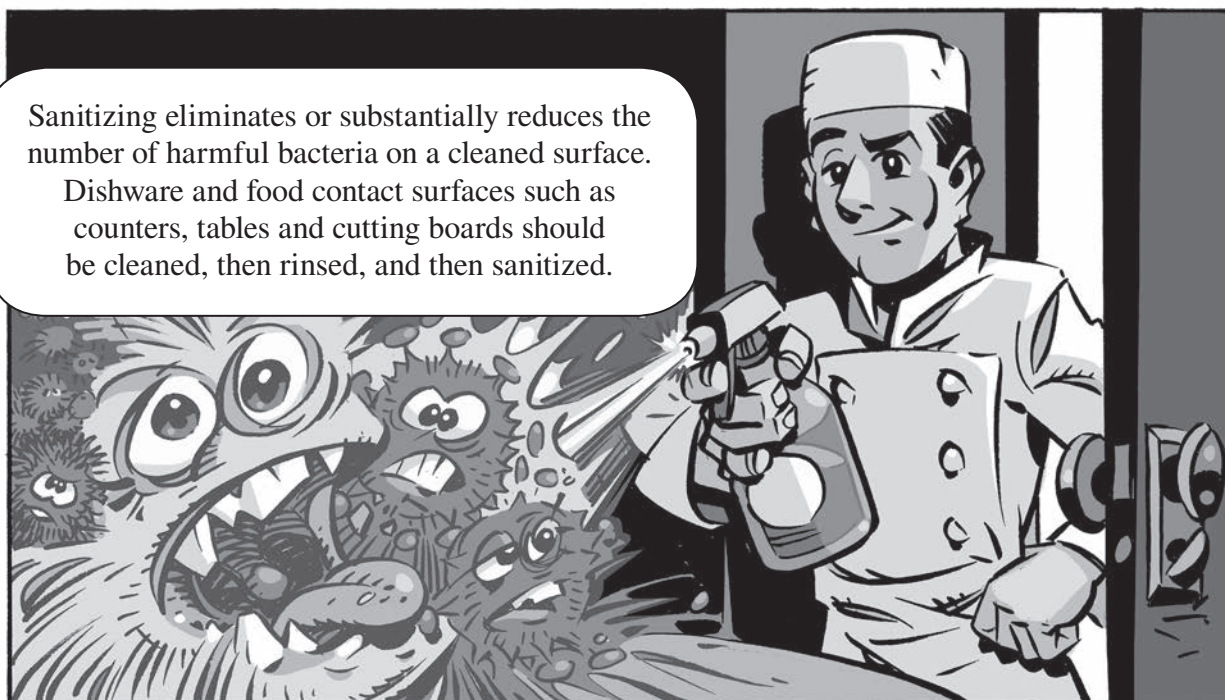


CLEANING AND SANITIZING

Cleaning and sanitizing are two separate steps. Cleaning with soap and water and rinsing well with clean water will remove surface dirt and grease, but it does not remove all harmful bacteria.



Sanitizing eliminates or substantially reduces the number of harmful bacteria on a cleaned surface. Dishware and food contact surfaces such as counters, tables and cutting boards should be cleaned, then rinsed, and then sanitized.



See Appendix E for a list of common sanitizers and their concentrations.

Understanding the basic principles of the dishwashing operation helps to reinforce the importance of sanitation and avoiding cross-contamination. There are two methods for cleaning dishware: manual and mechanical.

DISHWASHING: MANUAL

For manual dishwashing, three separate sinks are recommended for washing, rinsing and sanitizing. A place to air dry the dishware is also required.



1: SCRAPING

- Use hot water and good friction with nylon brushes or pads.
- Soak flatware and utensils for 10 to 15 minutes in a 'bus pan' of hot water and a commercial soaking chemical.
- Pre-soak dirty pots and pans.



2: WASHING

- Wash with a commercial grade detergent in 45°C (113°F) clean water.
- Change water frequently.



3: RINSING

- Rinse in clean hot water to remove detergent.



4: SANITIZING

- Sanitize for two minutes in 28 ml (1 oz) commercial chlorine bleach per 4.5L (1 gallon) of water or use another approved sanitizer.
- Use chemical test strips to measure sanitizer concentration.



5: AIR DRYING

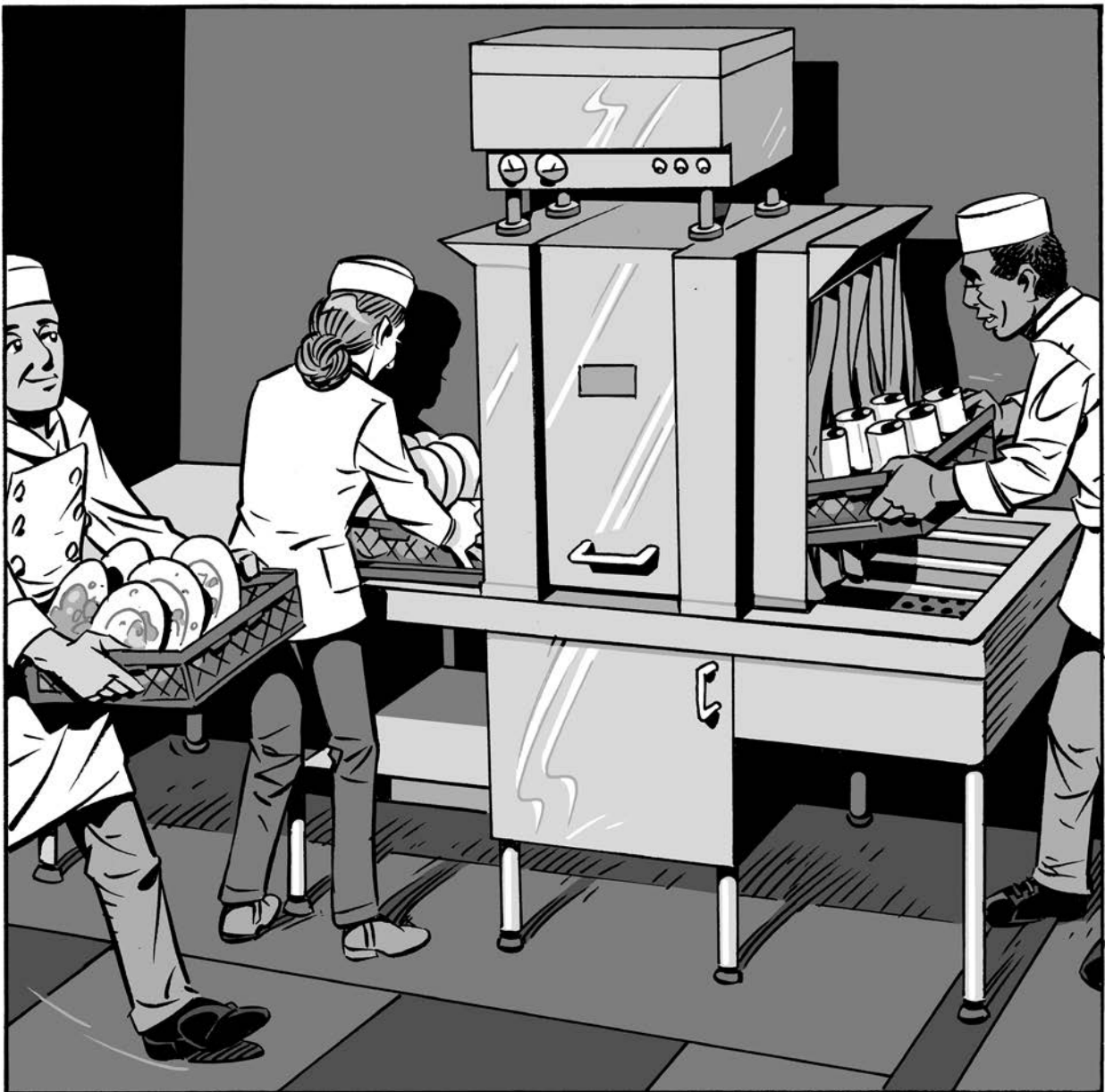
- Drain boards should be clean and sanitized and be sloped for drainage.
- All dishes, pots and pans, cutlery and utensils should be dry and cool before storage.
- Never towel dry.



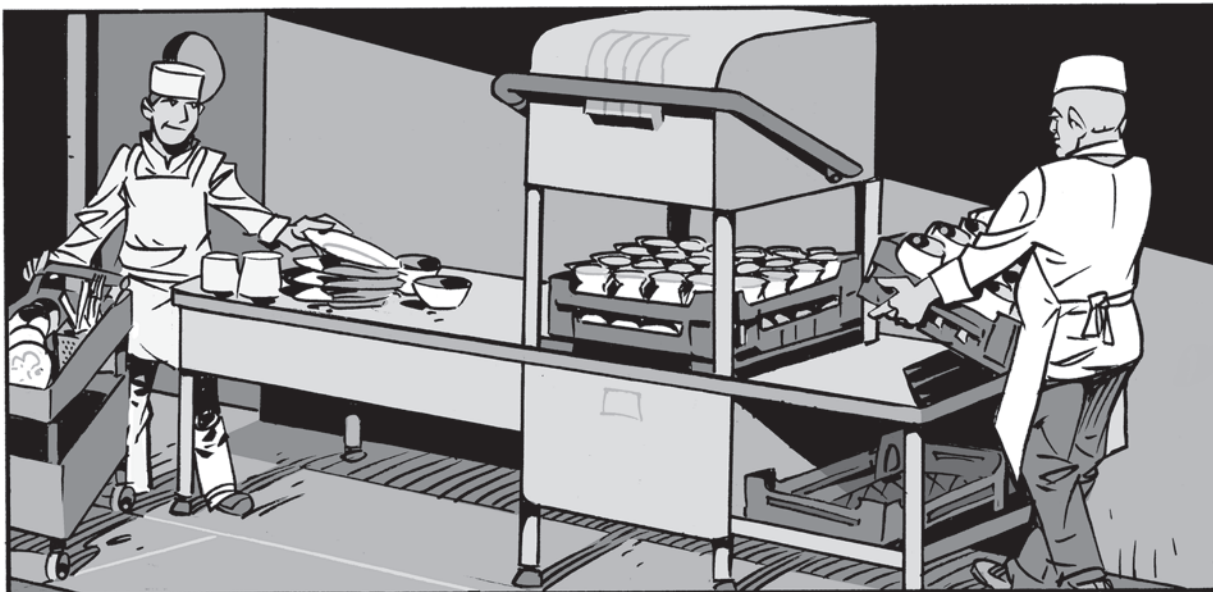
DISHWASHING: MECHANICAL

There are two kinds of mechanical dishwashers:
HIGH-TEMPERATURE AND LOW-TEMPERATURE.

HIGH-TEMPERATURE dishwashers have heated wash and rinse cycles. Most high-temperature dishwashers have two temperature gauges: one for the wash cycle and one for the final rinse (sanitizing) cycle. The temperature of the wash cycle must reach at least 60°C (140°F). The temperature on the final rinse cycle must reach at least 82°C (180°F) and run for at least 10 seconds at this temperature.



LOW-TEMPERATURE dishwashers have a heated wash temperature of at least 60°C (140°F) followed by a warm or cold rinse cycle with chemical sanitizer. The final rinse must have a concentration of 50ppm chlorine or 12.5ppm iodine, or follow the manufacturer’s instructions.



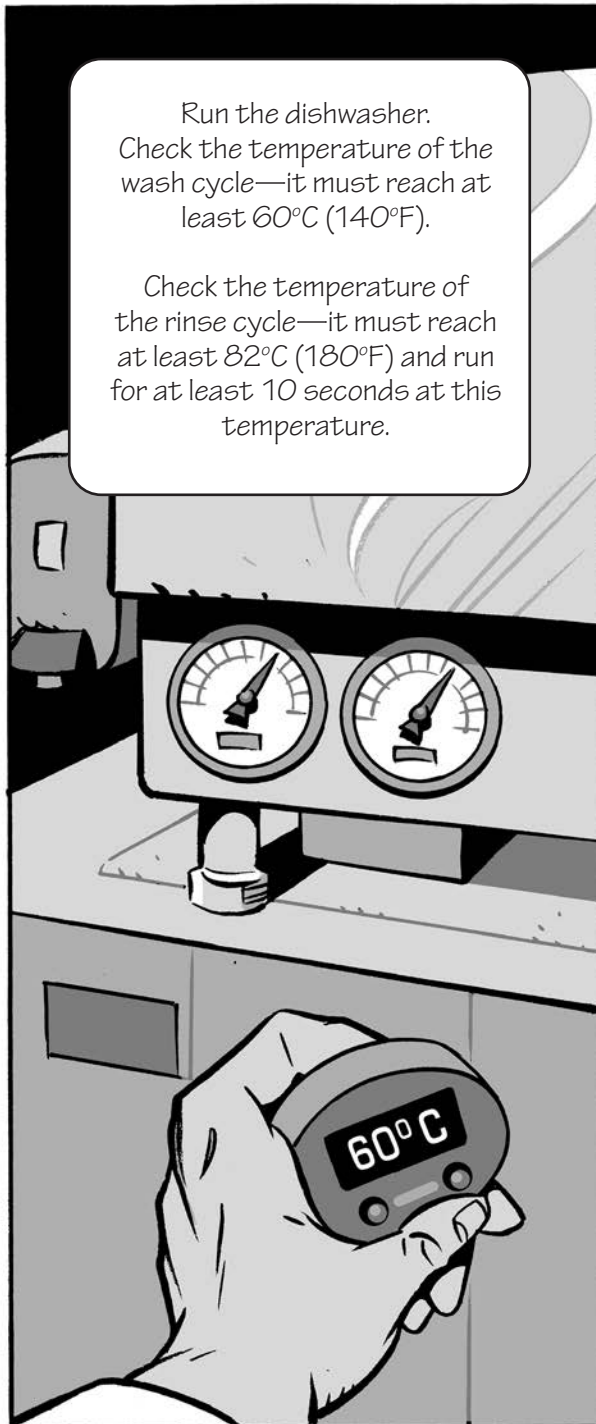
Glass washers operate at temperatures that are lower than mechanical dishwashers, 50°C to 60°C (120°F to 140°F). Chemical sanitizers are used instead of hot water. Glass washers will not remove dried-on sugar, cream or juice. Pre-soaking and scrubbing with a brush may be necessary.



Dishwasher maintenance is critical to ensure that machines operate properly. Review and follow the manufacturer’s instructions for changing water, cleaning scrap screens, removing and cleaning spray nozzles, and other necessary cleaning and maintenance.

For all types of dishwashing, it is important that proper wash and rinse temperatures and sanitizing solution concentrations are maintained.

TO CHECK HIGH-TEMPERATURE DISHWASHERS:



TO CHECK LOW-TEMPERATURE DISHWASHERS:



SANITATION PLANS



A sanitation plan has two components:

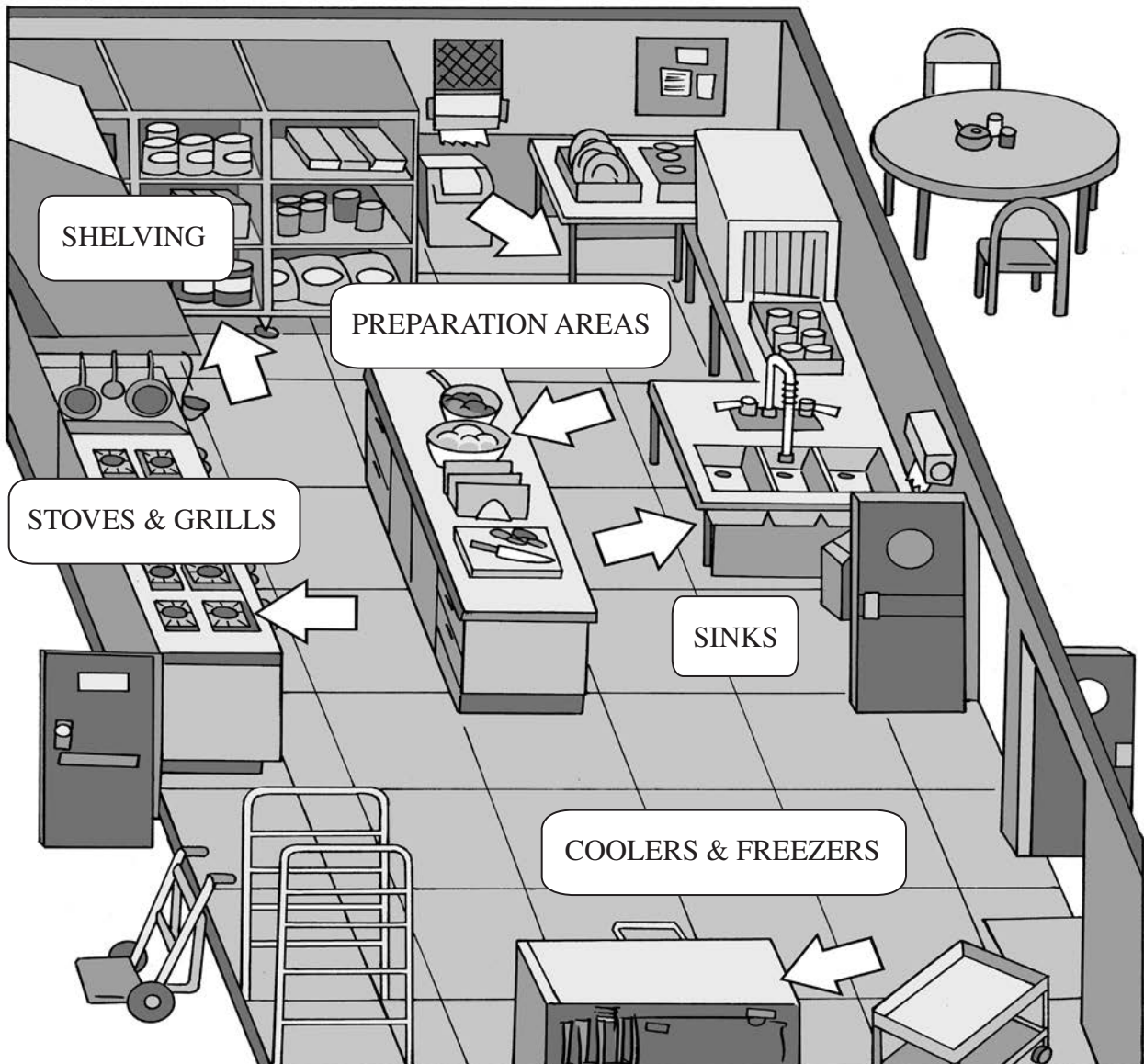
1. A list of cleaning and sanitizing agents used in the premises including which chemicals to use for each task, the concentration required for each chemical and task, and how to safely store the chemicals.
2. A cleaning schedule that specifies each item that needs to be cleaned, how it should be cleaned, who is responsible for cleaning it, and how frequently it should be cleaned.



If your position in the food service establishment includes responsibility for cleaning tables, fixtures, equipment, walls, floors or food contact surfaces, make sure that you are familiar with, and follow, your establishment's sanitation plan and where appropriate, the manufacturers' instructions.

**In a culture of food safety, ‘out of sight’ is definitely NOT ‘out of mind’!
Remember that surfaces under cabinets, behind equipment and around waste
containers also collect dirt and filth and can attract pests.**

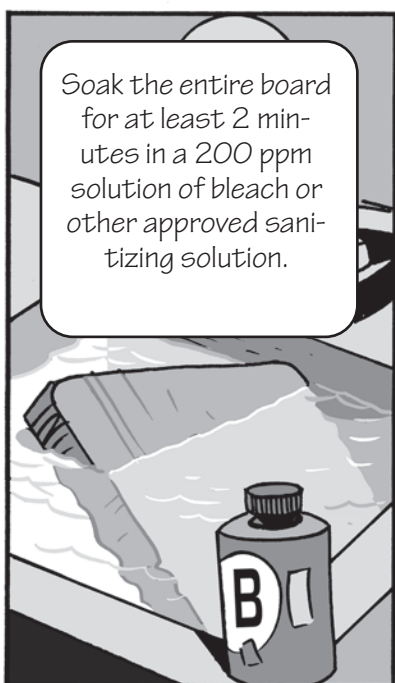
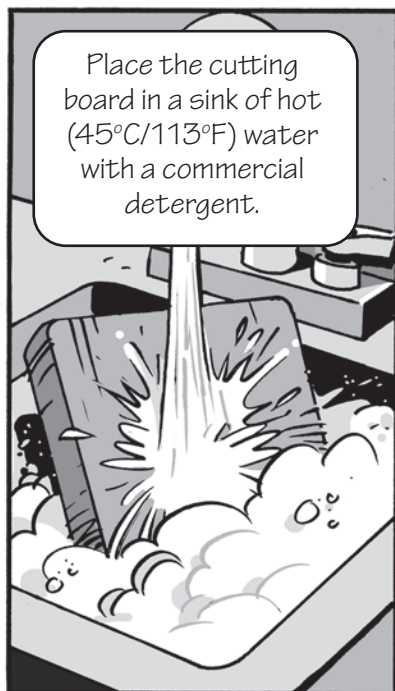
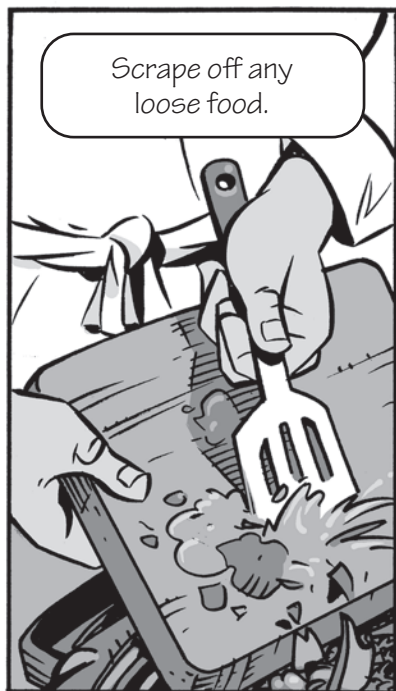
Some of the many ‘out of sight’ areas that must be cleaned regularly as part of a Sanitation Plan Cleaning Schedule include behind, under and on top of:



Most food processing equipment used in food service establishments is intended to be dismantled so that each part can be cleaned and sanitized thoroughly. Some establishments may have equipment that is designed by the manufacturer to be cleaned in place (CIP). CIP refers to the cleaning practice of cleaning and sanitizing food processing equipment while it is still assembled. Only equipment that is specifically designed by the manufacturer to be cleaned in place should be cleaned and sanitized in this manner.

WOODEN CUTTING BOARDS

The use of wooden cutting boards in food service establishments is discouraged or prohibited in many jurisdictions. If your health authority permits the use of wooden cutting boards, they should be cleaned and sanitized as follows:

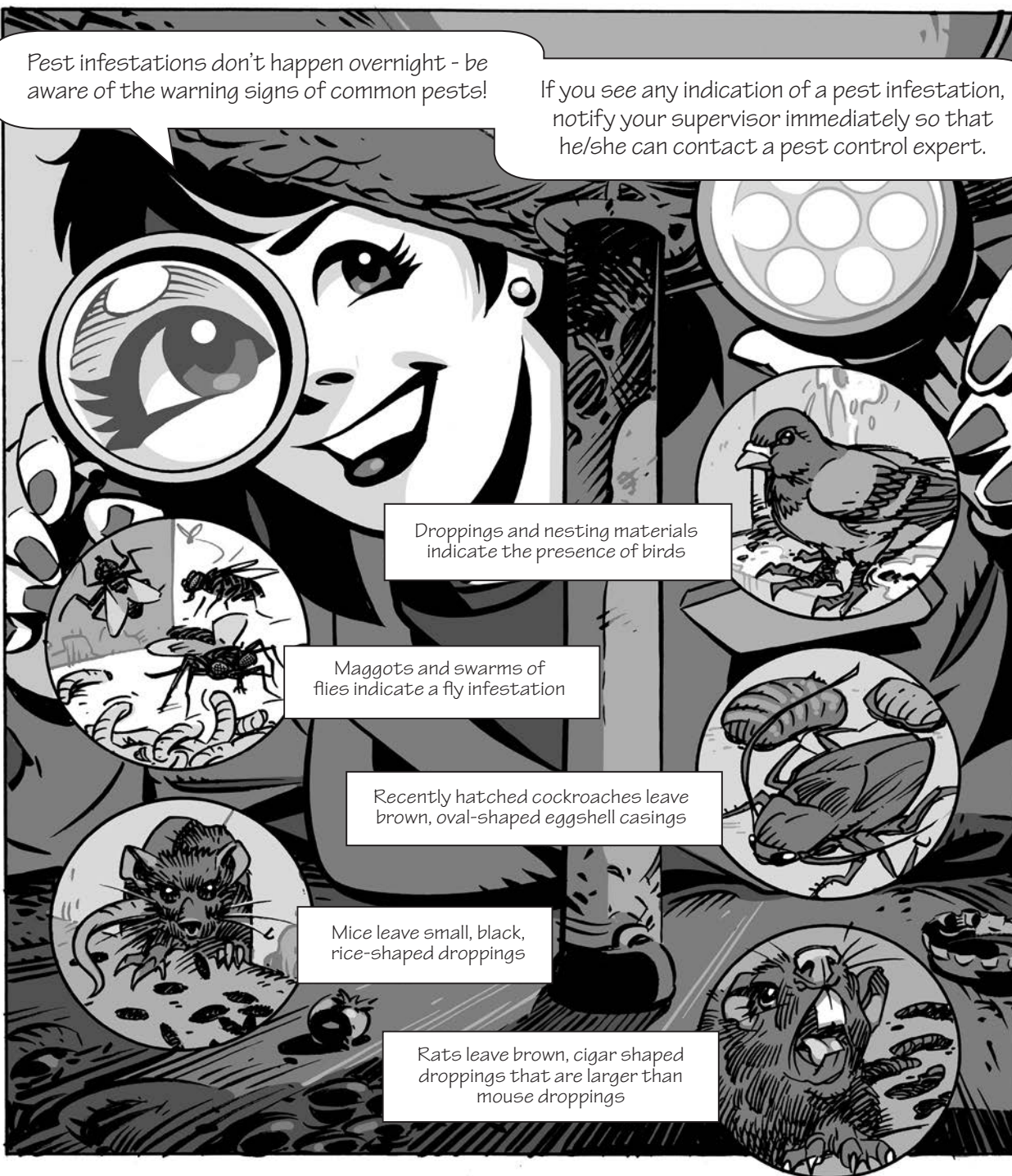


PEST CONTROL

Rodents, insects and other pests carry pathogens that can be transmitted through their droppings, urine, and saliva, so it is very important to prevent pest infestations in food service establishments.

Pest infestations don't happen overnight - be aware of the warning signs of common pests!

If you see any indication of a pest infestation, notify your supervisor immediately so that he/she can contact a pest control expert.



Droppings and nesting materials indicate the presence of birds


Maggots and swarms of flies indicate a fly infestation

Recently hatched cockroaches leave brown, oval-shaped eggshell casings

Mice leave small, black, rice-shaped droppings

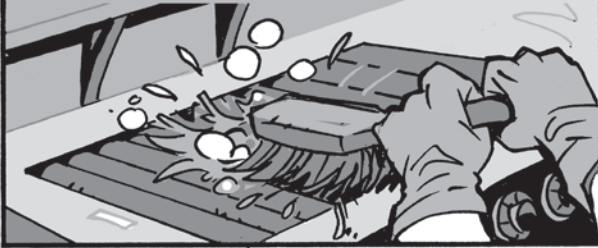
Rats leave brown, cigar shaped droppings that are larger than mouse droppings

Pests will only go where they have access to food, water and shelter, so the best way to prevent pest infestations is to limit their access to the building and to take away the things they need to survive.

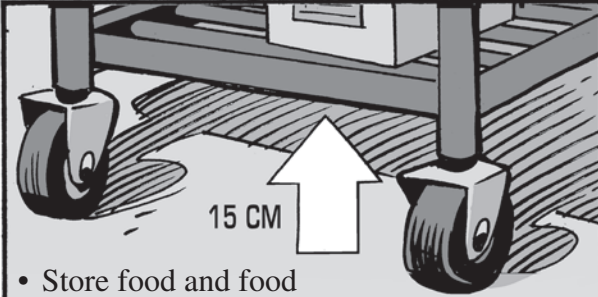


- Clean and sanitize food contact surfaces daily. This includes prep surfaces, grills, cooking surfaces, and counter tops.

- Keep cooking equipment free of grease and dirt buildup.

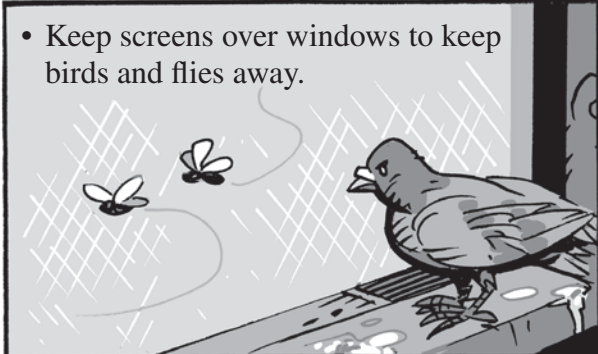


- Clean underneath equipment and shelves.





- Store food and food utensils at least 15 cm off the floor.

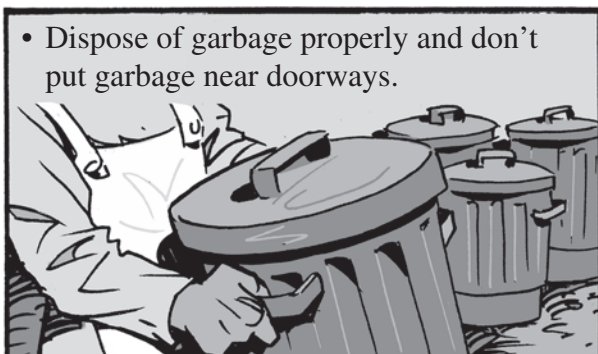
- Keep screens over windows to keep birds and flies away.



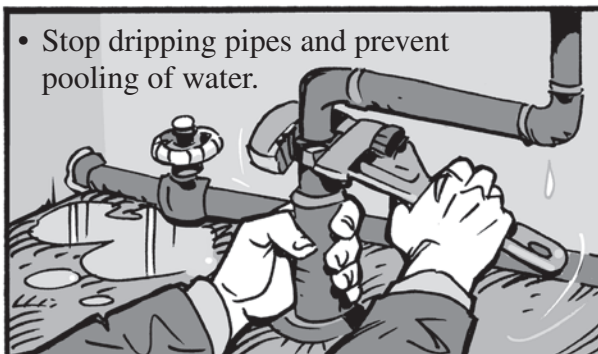
- When storing food in dry storage, keep food in tightly sealed, food-grade containers.



- Dispose of garbage properly and don't put garbage near doorways.



- Stop dripping pipes and prevent pooling of water.



Premises Requirements

Food service workers, even owners and managers, don't often have the luxury of designing an establishment from the ground up. However, an understanding of premises requirements and the safest way for food to 'flow' through the kitchen, service, dishwashing and storage areas, can help to build a culture of food safety in a food service establishment.

LEARNING OUTCOMES

**BY THE END OF THIS UNIT,
PARTICIPANTS WILL BE ABLE TO:**

- List the nine basic requirements for food service establishments
- Describe how a kitchen should be organized to reduce the risk of food contamination
- Describe the characteristics of safe food contact surfaces
- Describe the key parts of an equipment maintenance program



NINE BASIC REQUIREMENTS IN A FOOD SERVICES ESTABLISHMENT





PROPER
DISHWASHING
FACILITIES

ADEQUATE COOLER,
FREEZER, AND DRY
STORAGE SPACE

GREASE TRAPS

PROPER VENTILATION

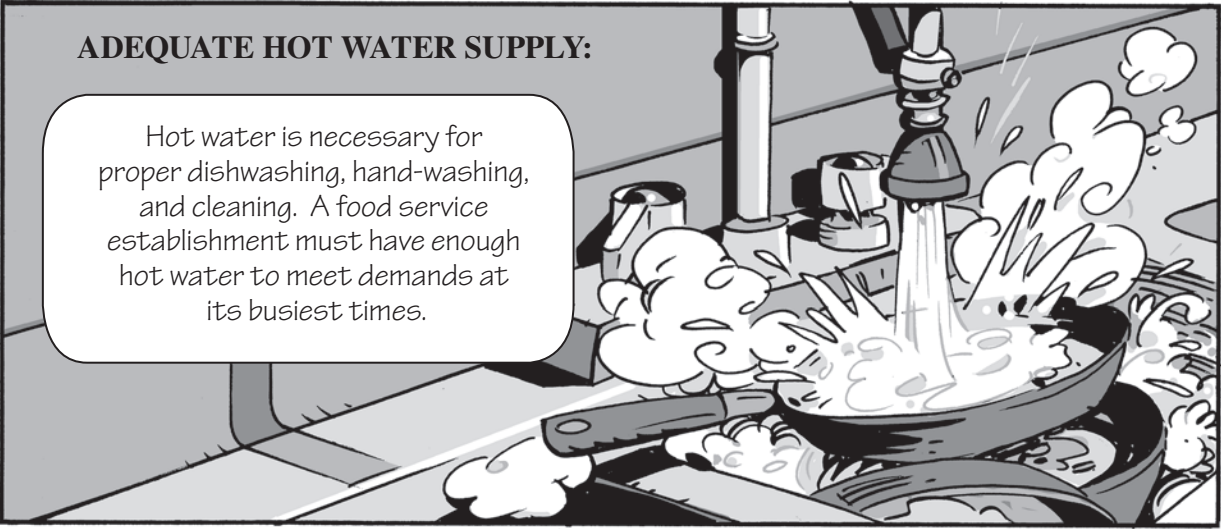
POTABLE WATER:

Potable water is water that is safe for human consumption: for eating, drinking, cooking and making ice.



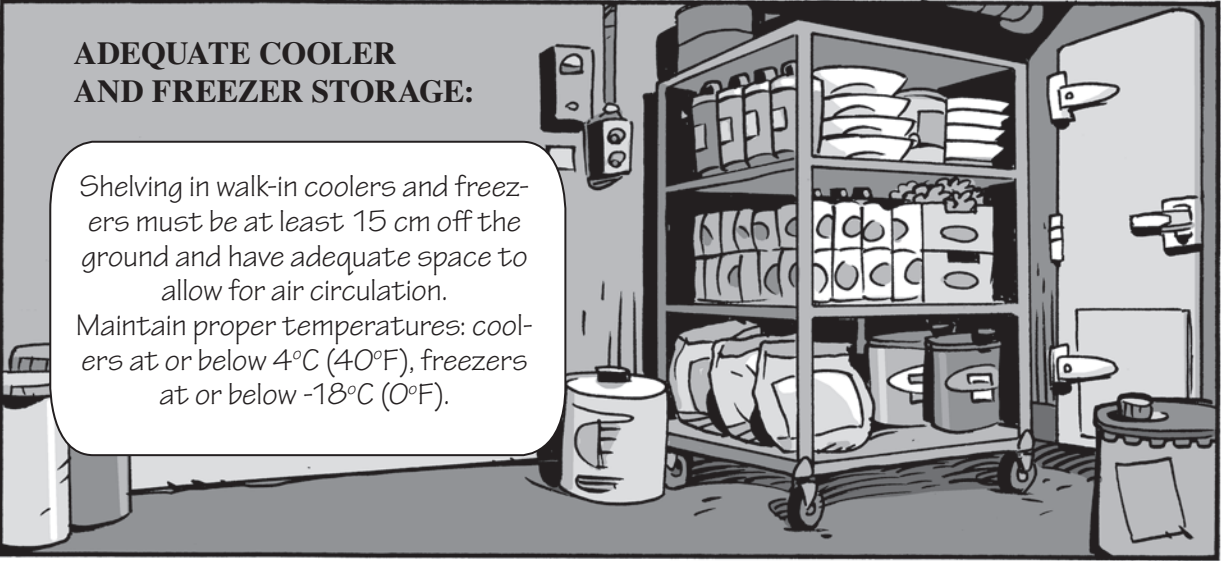
ADEQUATE HOT WATER SUPPLY:

Hot water is necessary for proper dishwashing, hand-washing, and cleaning. A food service establishment must have enough hot water to meet demands at its busiest times.



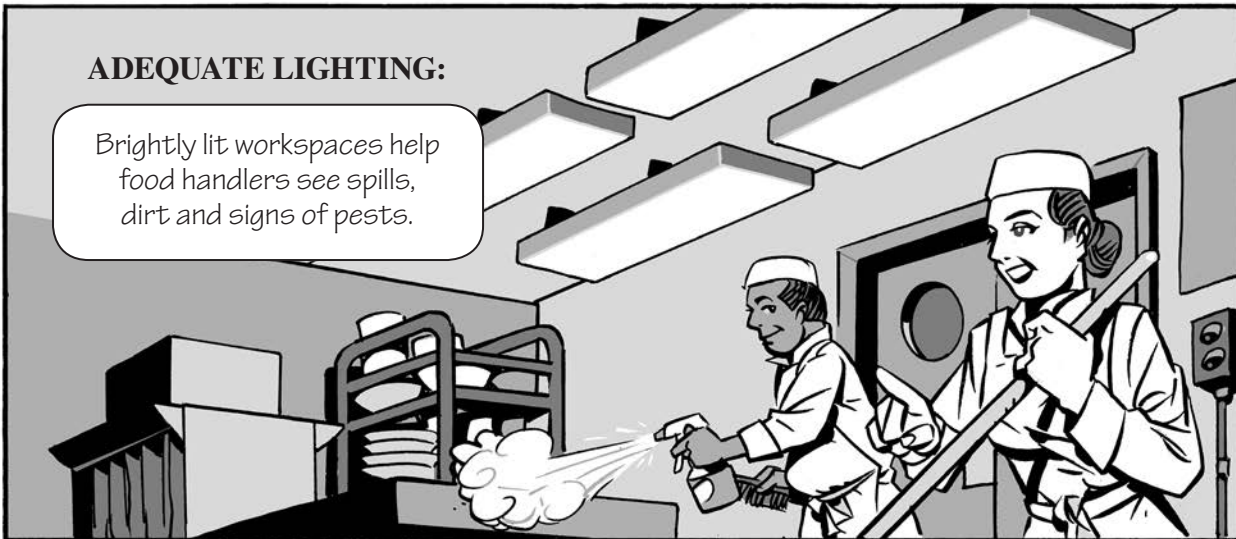
ADEQUATE COOLER AND FREEZER STORAGE:

Shelving in walk-in coolers and freezers must be at least 15 cm off the ground and have adequate space to allow for air circulation. Maintain proper temperatures: coolers at or below 4°C (40°F), freezers at or below -18°C (0°F).



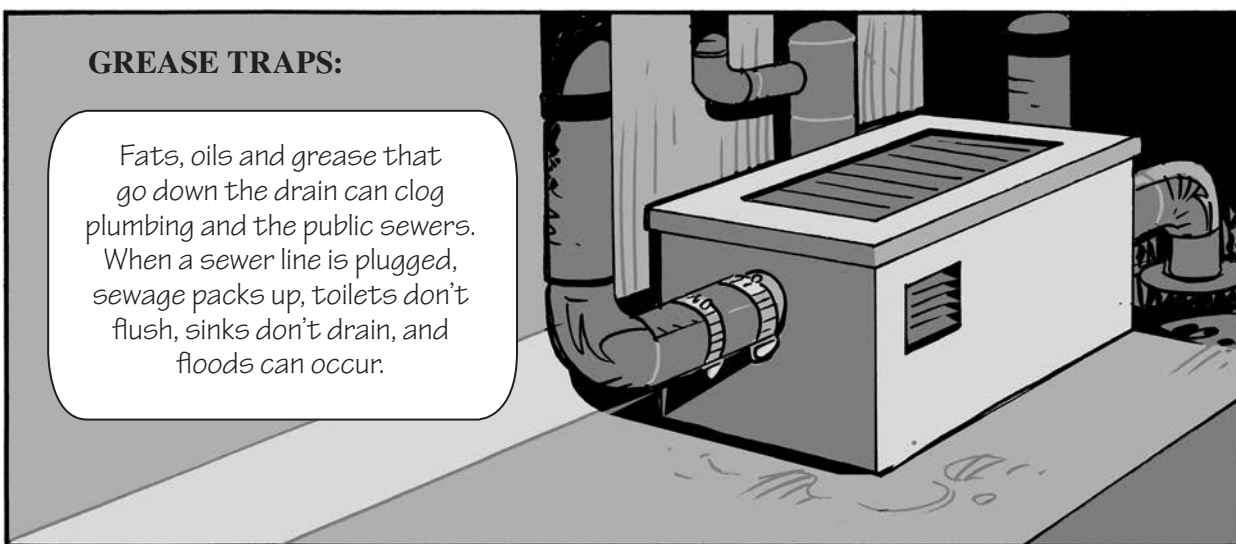
ADEQUATE LIGHTING:

Brightly lit workspaces help food handlers see spills, dirt and signs of pests.



GREASE TRAPS:

Fats, oils and grease that go down the drain can clog plumbing and the public sewers. When a sewer line is plugged, sewage packs up, toilets don't flush, sinks don't drain, and floods can occur.



PROPER VENTILATION:

Proper ventilation keeps premises free from odours, grease, smoke, heat and steam.



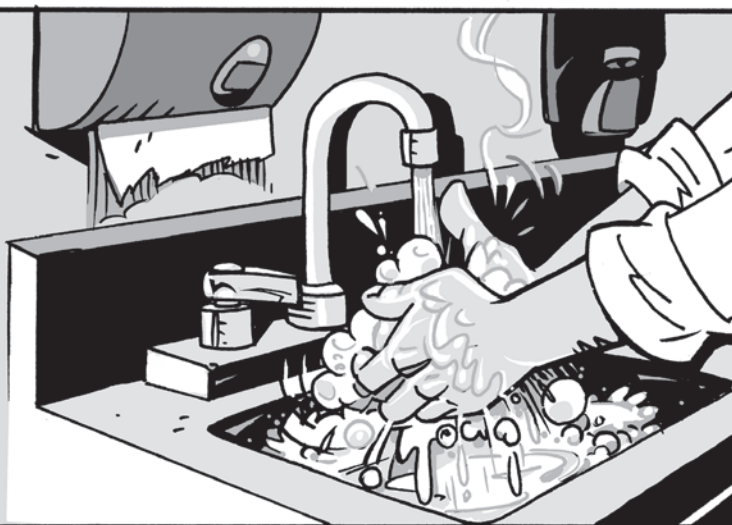
PROPER WASTE DISPOSAL:

An establishment must have proper waste disposal procedures in place. Garbage attracts pests and can be a source of cross-contamination.



HAND WASHING SINKS:

Food premises are required to have dedicated hand-washing sinks that are easily accessed from all food preparation stations. The sinks must be equipped with liquid soap in a dispenser and single use paper towels.

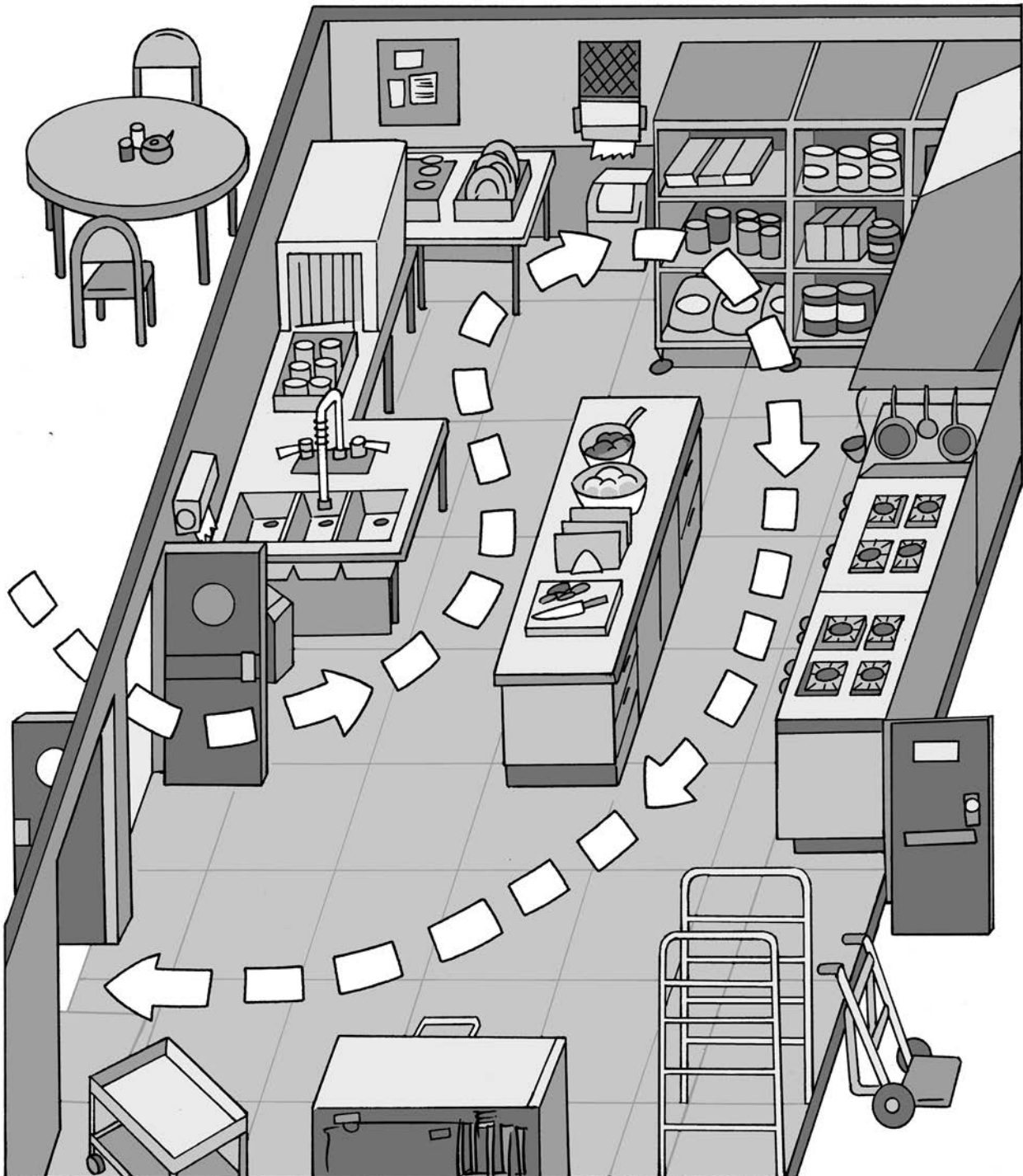


PROPER DISHWASHING FACILITIES:

A foodservice establishment must have dishwashing facilities that will handle its needs at its busiest times.



The 'flow' of food and dishes in a food service kitchen should ensure that clean dishes do not come into contact with dirty dishes, clean linens do not come into contact with soiled linens, and raw potentially hazardous foods do not come into contact with prepared and ready-to-eat foods.



FOOD CONTACT SURFACES



Food contact surfaces must be:

- Durable
- Non-absorbent
- Easy to clean
- Non-toxic
- Smooth
- Light coloured

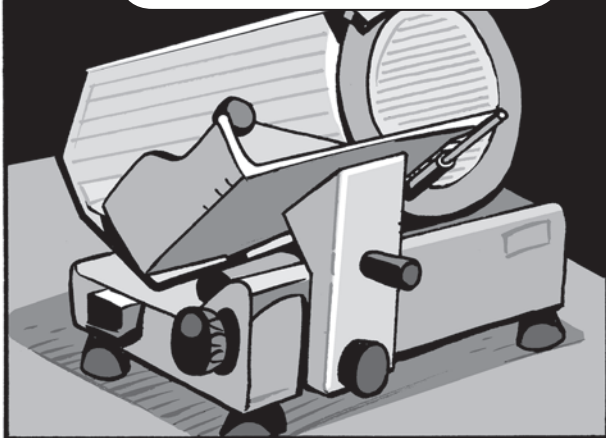
PREVENTATIVE MAINTENANCE

In order to ensure the efficiency and durability of equipment in a food service establishment, a regular maintenance program should be in place.

There are two parts to a preventative maintenance program:

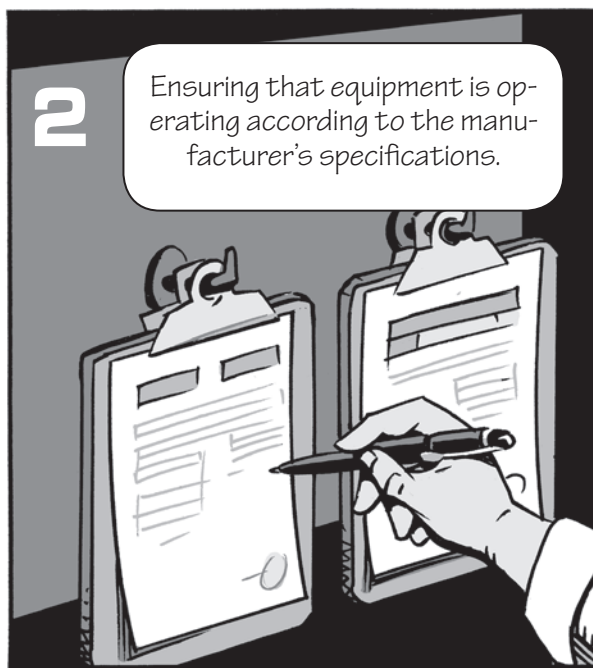
1

Ensuring that equipment is kept in good working order so that it is clean and free of grease build-up and dust.

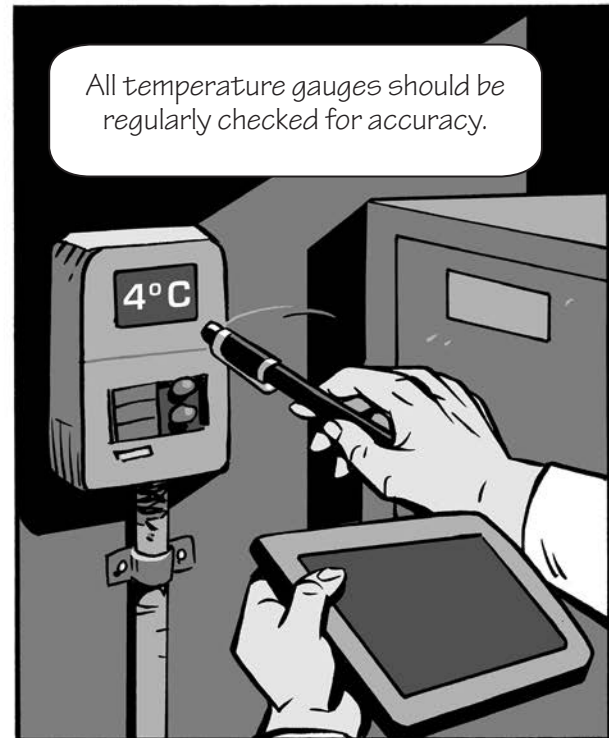
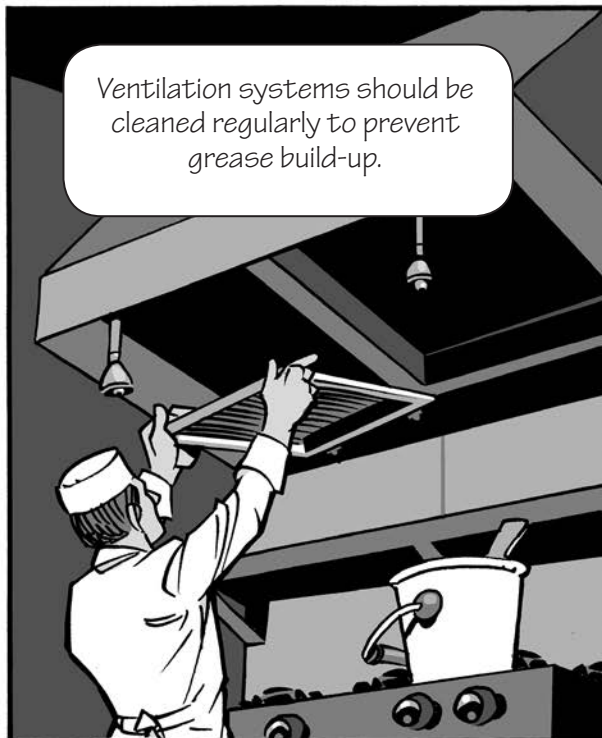


2

Ensuring that equipment is operating according to the manufacturer's specifications.



SOME IMPORTANT PREVENTATIVE MAINTENANCE MEASURES ARE:

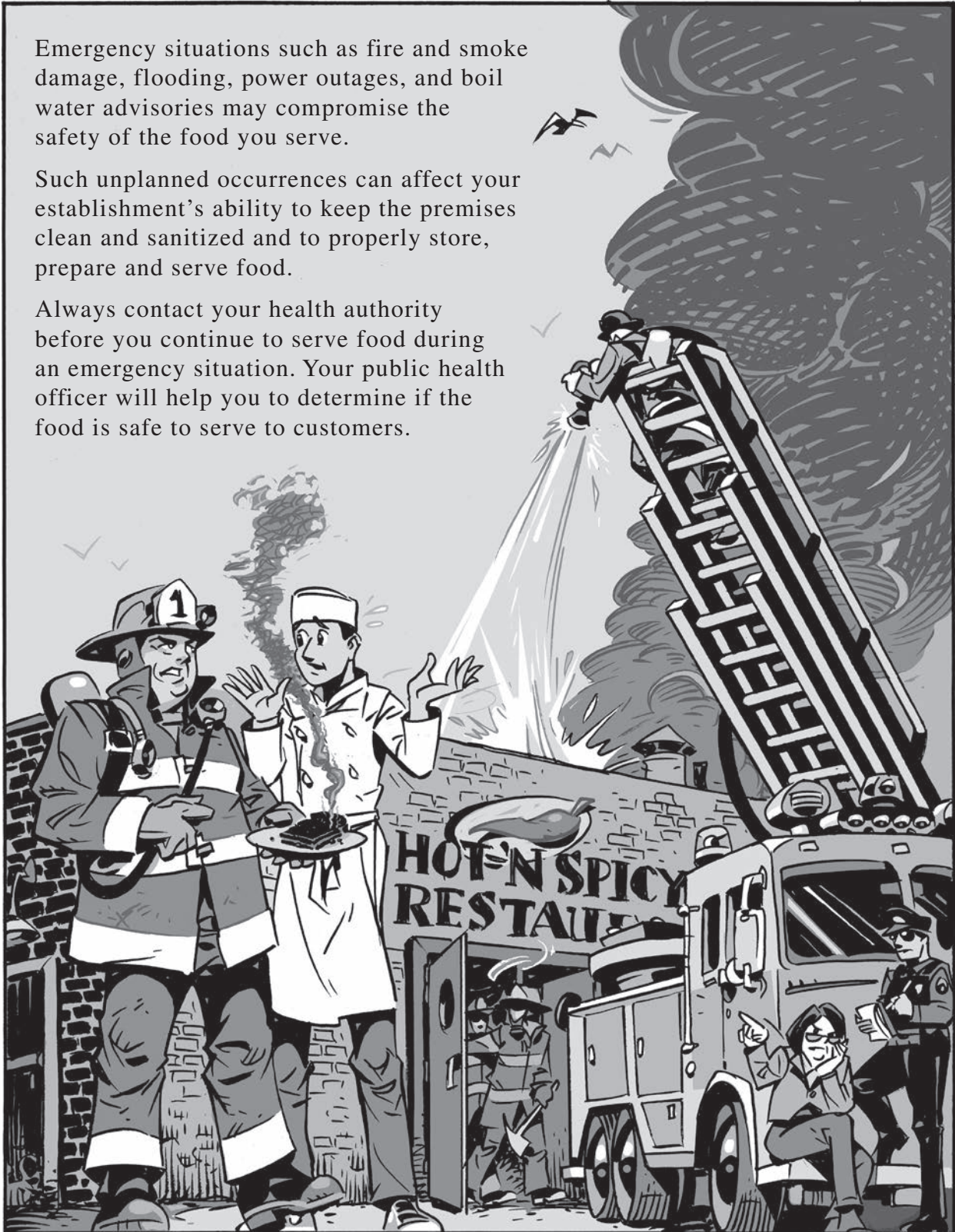


EMERGENCY SITUATIONS

Emergency situations such as fire and smoke damage, flooding, power outages, and boil water advisories may compromise the safety of the food you serve.

Such unplanned occurrences can affect your establishment's ability to keep the premises clean and sanitized and to properly store, prepare and serve food.

Always contact your health authority before you continue to serve food during an emergency situation. Your public health officer will help you to determine if the food is safe to serve to customers.



Appendices

- **Appendix A:**
Government Agency Responsibilities
- **Appendix B:**
Foodborne Illness Chart
- **Appendix C:**
Oysters and Raw Shellfish:
Handle With Care!
- **Appendix D:**
Food Thermometers
- **Appendix E:**
Sanitizing Solutions
- **Appendix F:**
Best Practices for Preventing
Allergic Reactions
- **Registration Form**
- **Answer Sheet**



Appendix A

CANADIAN GOVERNMENT AGENCY RESPONSIBILITIES

In Canada, there are several different government agencies that are responsible for food safety. While there are some variations between the provinces and territories, the following table outlines which government agencies are responsible for food safety in different parts of the food industry.

<p>Local Health Authorities (Municipal, City or Provincial Health Departments)</p>	<ul style="list-style-type: none"> • Food sold in retail stores • Food served in food service establishments • Food served in institutions such as hospitals and care homes • Food processing facilities that DO NOT ship their products across provincial boundaries or export out of the country • Food storage facilities such as food warehouses • Transportation of food
<p>Health Canada, First Nations Health Authorities</p>	<ul style="list-style-type: none"> • Food served on public conveyances such as ships and airplanes • Food prepared and served on First Nations and Inuit lands
<p>Canadian Food Inspection Agency</p>	<ul style="list-style-type: none"> • Imported foods • Food processing facilities that ship their products across provincial boundaries or export out of the country
<p>Provincial Agriculture Departments</p>	<ul style="list-style-type: none"> • Food grown on farms

Appendix B: Foodborne Illness Chart



Pathogen	Signs and Symptoms	Incubation Period	Food Involved
<i>Anisakis simplex</i> (infection)	abdominal pain; vomiting; coughing	12 hours to several days	salt-water fish
<i>Bacillus cereus</i> (toxico-infection)	nausea; abdominal pain; diarrhea; vomiting	up to 24 hours	cereal products; rice; custards and sauces; meatloaf
<i>Campylobacter jejuni</i> (infection)	diarrhea (sometimes bloody); severe abdominal pain; fever; anorexia; headache; vomiting	2 to 5 days	Raw milk, poultry; beef liver; raw clams; contaminated water
<i>Clostridium botulinum</i> (intoxication)	vertigo; double vision; difficulty swallowing, speaking and breathing; weak muscles; respiratory paralysis. Frequently fatal.	18 to 36 hours	home-canned low acid food; garlic and oil mixtures; vacuum-packed fish; fermented fish eggs; fish; marine mammals
<i>Clostridium perfringens</i> (toxico-infection)	abdominal pain; diarrhea	8 to 22 hours	cooked meat; poultry; gravy; sauces; soups
<i>Cryptosporidium</i> (infection)	severe diarrhea; low grade fever and severe intestinal distress	1 to 12 days	any food product that comes into contact with a contaminated person or contaminated water
<i>Escherichia coli</i> O157:h7 (<i>E. coli</i>) (toxico-infection)	severe abdominal pain; diarrhea (sometimes bloody); nausea; vomiting; fever; chills; headache; muscular pain; bloody urine	24 to 72 hours	soft unpasteurized cheese; contaminated water; any undercooked animal-source foods, especially hamburger
<i>Giardiasis lamblia</i> (infection)	abdominal pain; diarrhea; fever; cramps	1 week	water; raw vegetables and fruits
<i>Hepatitis A</i> (infection)	fever; anorexia; nausea; abdominal pain; jaundice	15 to 50 days	shellfish; contaminated water; any food contaminated by the feces, urine or blood of infected humans and other primates
<i>Listeria monocytogenes</i> (infection)	nausea; vomiting; stomach cramps; diarrhea; headache; constipation; fever	1 to 70 days	unpasteurized milk; soft cheeses; undercooked poultry; prepared meats; unwashed raw vegetables
<i>Norovirus</i> (infection)	nausea; vomiting; diarrhea; abdominal pain	24 to 72 hours	contaminated water; food or food contact surfaces

Pathogen	Signs and Symptoms	Incubation Period	Food Involved
<i>Salmonella</i> (infection)	abdominal pain; diarrhea; chills; fever; nausea; vomiting	usually 12 to 36 hours, but could be 6 to 72 hours	poultry; meat and meat products; eggs and egg products; other food contaminated by the feces of infected humans and other animals
<i>Shigella</i> (infection)	abdominal pain; diarrhea (sometimes bloody); chills; fever; dehydration	12 to 50 hours	moist prepared foods, especially salads such as potato, tuna and macaroni salads; raw fruits and vegetables; unpasteurized milk and dairy products; poultry
<i>Staphylococcus</i> (intoxication)	nausea; vomiting; abdominal pain; diarrhea	2 to 4 hours	ham; meat; poultry; cream-filled pastry; food mixtures; leftover foods
<i>Trichinella</i> (infection)	abdominal pain; vomiting; nausea; fever; swelling around the eyes; muscular pain; chills; laboured breathing	1 to 2 days for gastrointestinal symptoms; other symptoms occur within 2 to 4 weeks	pork; bear meat; walrus flesh
<i>Yersinia</i> (infection)	watery diarrhea; vomiting; abdominal pain; fever; headache; sore throat; may mimic appendicitis	24 to 48 hours	meats (especially pork, beef and lamb); tofu; oysters; fish; ice cream; powdered milk; unpasteurized milk; raw vegetables; soy products

Other Types of Foodborne Illness

Cause of Illness	Signs and Symptoms	Incubation Period	Food Involved
Allergies	flush; tingling skin; hives; difficulty breathing; anaphylactic shock. Sometimes fatal.	varies—can be instantaneous	various—common allergens include nuts, wheat, soya, MSG, milk, eggs, fish/shellfish, sulphites
Food intolerances and sensitivities	nausea; vomiting; diarrhea; bloating; fatigue; weakness; headaches	varies—can be instantaneous	various
Paralytic/neurologic shellfish poisoning (also known as 'Red Tide Poisoning')	Tingling; burning; numbness around lips and finger tips; giddiness; incoherent speech; difficulty standing; respiratory paralysis	30 minutes to 2 hours	mussels, clams and other bivalve molluscs

OYSTERS AND RAW SHELLFISH: HANDLE WITH CARE!

Shellfish feed by filtering water and eating algae and other microorganisms (microbes) found in the water. Sometimes pathogens are in the water and get into shellfish when they are feeding. Some pathogens can grow and multiply in shellfish—especially as the temperature gets warmer. If someone then eats the contaminated shellfish without properly cooking them, they can get sick.

Oysters are a type of shellfish that are commonly served raw or “on the shell.” Because oysters served raw are not cooked, keeping them cold is the main control step to keep them safe to eat. However, in 2015, a large outbreak of *Vibrio parahaemolyticus* (known as *Vp*) caused over 60 illnesses in people who had eaten raw oysters harvested in BC. This was the largest outbreak of *Vp* ever recorded in Canada.

Vp can only grow when temperatures are above 10°C. The only way to prevent *Vp* from growing in oysters is to keep them cold all the way through the food chain, from the ocean through to the customer’s plate. While it’s not known where along the food chain the 2015 oysters were temperature abused, it’s important that everyone along that food chain does their part to ensure that oysters meant to be served raw are handled properly and kept cold.

When you receive oysters or any other shellfish, just like raw meat or poultry, they must be refrigerated immediately. Because oysters are so sensitive to temperature changes, there are special conditions that also must be followed to keep them safe:

- Check the temperature of oysters when they arrive—if the ice has melted, or if the temperature is above 4°C—reject the shipment. It may already be contaminated.
- Do not accept oysters if there is no harvest tag on the shellfish bag. These oysters may have been harvested illegally or from closed harvest areas.
- Keep a written record of the dates on the harvest tags as they are being served.

- Keep harvest tags for 90 days after serving.
- If you are shucking oysters ahead of time, do it quickly, and put the oysters immediately back into the refrigerator until they are ready to be served.
- Restaurants that display oysters at an oyster bar should use ice on the bottom and on top of the oysters, and the oysters should be placed cup side down.
- Serve oysters on a plate of ice, and only serve small batches—6 to 12 at a time.
- During “buck-a-shuck” oyster sales, customers might order 100 or more oysters for their group. Don’t serve all the oysters at once—serve them in small batches. Once the group eats one small batch, bring the next fresh batch, so the oysters being served are always cold.
- Some jurisdictions require that establishments that serve raw oysters display a sign or have on their menu a food safety warning for customers that reads, “The consumption of RAW oysters poses an increased risk of foodborne illness. A cooking step is needed to eliminate potential bacterial or viral contamination. Medical Health Officer.” This warning gives customers the information they need to make an informed decision regarding the risk of eating raw oysters.







Appendix D: Food Thermometers

Food Thermometers: Types and Calibration

One of the critical factors in controlling pathogens in food is controlling temperatures. Disease-causing microbes such as bacteria grow very slowly at low temperatures, multiply rapidly in mid-range temperatures, and are killed at high temperatures. For safety, perishable foods must be held at proper cold temperatures to inhibit bacterial growth or cooked to temperatures high enough to kill harmful microbes.

It is essential to use a food thermometer when cooking meat, poultry, and egg products to prevent undercooking, and consequently, prevent foodborne illness. Many food handlers believe that visible indicators, such as colour changes, can be used to determine if foods are cooked to a point where pathogens are killed. However, recent research has shown that colour and texture indicators are unreliable.

Food Thermometer Types

Types	Speed	Placement	Usage Considerations
Thermocouple 	2–5 seconds	1 cm or deeper in the food, as needed	<ul style="list-style-type: none"> - Gives fastest reading - Good for measuring temperatures of thick & thin foods - Not designed to remain in food while it's cooking - Check internal temperature of food near the end of cooking time - Can be calibrated - More costly; may be difficult for consumers to find in stores
	10 seconds	At least 1.5 cm deep in the food	<ul style="list-style-type: none"> - Gives a fast reading - Can measure temperature in thin & thick foods - Not designed to remain in food while it's cooking - Check internal temperature of food near the end of cooking time - Some models can be calibrated; check manufacturer's instructions - Available in "kitchen" stores
Thermometer Fork Combination 	2–10 seconds	5–7 cm deep in the thickest part of the food	<ul style="list-style-type: none"> - Can be used in most foods - Not designed to remain in food while it's cooking - Sensor in tine of fork must be fully inserted - Check internal temperature of food near the end of cooking time - Cannot be calibrated - Convenient for grilling
Oven-Safe, Bimetal 	1–2 minutes	5–7 cm deep in the thickest part of the food	<ul style="list-style-type: none"> - Can be used in roasts, casseroles, and soups - Not appropriate for thin foods - Can remain in food while it's cooking - Heat conduction of metal stem can cause false high reading - Some models can be calibrated; check manufacturer's instructions
	15–20 seconds	5–7 cm deep in the thickest part of the food	<ul style="list-style-type: none"> - Can be used in roasts, casseroles, and soups - Temperature is averaged along probe, from tip to 5–8 cm up the stem - Cannot measure thin foods unless inserted sideways - Not designed to remain in food while it is cooking - Use to check the internal temperature of a food at the end of cooking time - Some models can be calibrated; check manufacturer's instructions - Readily available in stores
Instant-Read, Bimetal 			

D I G I T A L T Y P E

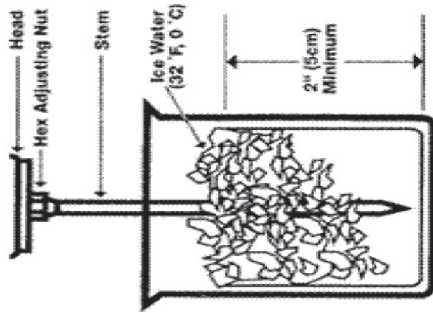
D I A L T Y P E

Calibrating a Thermometer

There are two ways to check the accuracy of a food thermometer: using ice water or using boiling water. Many food thermometers have a calibration nut under the dial that can be adjusted. Check the package for instructions.

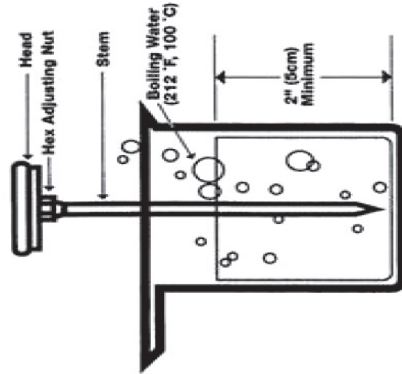
Ice Water

To use the ice water method, fill a large glass with finely crushed ice. Add clean tap water to the top of the ice and stir well. Immerse the food thermometer stem a minimum of 5 cm into the mixture, touching neither the sides nor the bottom of the glass. Wait a minimum of 30 seconds before adjusting. Without removing the stem from the ice, hold the adjusting nut under the head of the thermometer with a suitable tool and turn the head so the pointer reads 0°C (32°F).



Boiling Water

To use the boiling water method, bring a pot of clean tap water to a full rolling boil. Immerse the stem of a food thermometer in boiling water a minimum of 5 cm and wait at least 30 seconds. (For ease in handling, the stem of the food thermometer can be placed through the clip section of the stem sheath and, holding the sheath horizontally, lowered into the boiling water.)



Without removing the stem from the pan, hold the adjusting nut under the head of the food thermometer with a suitable tool and turn the head so the thermometer reads 100°C (212°F). For true accuracy, distilled water must be used and the atmospheric pressure must be one atmosphere (76 cm of mercury). A consumer using tap water in unknown atmospheric conditions would probably not measure water boiling at 100°C (212°F). Most likely it would boil as much as 3°C (5°F), lower. Remember water boils at a lower temperature in a high altitude area, so it is best to add a couple of degrees for a margin of safety.

Even if the food thermometer cannot be calibrated, it should still be checked for accuracy using either method. Any inaccuracies can be taken into consideration when using the food thermometer or the food thermometer can be replaced. For example, water boils at 100°C (212°F). If the food thermometer reads 101°C (214°F) in boiling water, it is reading one degree too high. Therefore one degree must be subtracted from the temperature displayed when taking a reading in food to find out the true temperature. In another example, for safety, ground beef patties must reach 74°C (165°F). If the thermometer is reading one degree too high, one degree would be added to the desired temperature, meaning hamburger patties must be cooked to 75°C (167°F).

Appendix E: Sanitizing Solutions

COMMON SANITIZING SOLUTIONS

Type of Washing	Chlorine Bleach based on 5% bleach concentrate	Iodine	Quats Quaternium Ammonium Compounds
Manual dishwashing	200 ppm Approx. 15 mL bleach in 4.5 L water	25 ppm or follow manufacturers' directions	200 ppm or follow manufacturer's instructions
Mechanical dishwashing	50 ppm Approx. 5 mL bleach in 4.5 L water	N/A	N/A
Glass washing	50 ppm Approx. 5 mL bleach in 4.5 L water in the cold water cycle	12.5 to 25 ppm or follow manufacturers' directions	N/A
Clean in place (CIP)	200 ppm Approx. 15 mL bleach in 4.5 L water	12.5 to 25 ppm or follow manufacturers' directions	200 ppm or higher according to manufacturers' directions

USING SANITIZERS

- **Use a test kit or test papers to check sanitizer concentrations.**
- **Use freshly mixed bleach solutions for clean-in-place situations. Use regular, unscented bleach.**
- **Always review and follow manufacturers' directions for proper strength and applications.**
- **Store chemicals away from all food, either in a separate chemical storage area or in a locked cupboard.**

BEST PRACTICES FOR PREVENTING ALLERGIC REACTIONS

All individuals in a food establishment play a role in preventing allergic reactions. The following are best practices that should be implemented:

- Management should develop and implement an allergy policy including procedures and make sure that it is clearly communicated to all staff identifying their roles and responsibilities.
- Ingredients may have several different names, and priority allergens should be clearly indicated in food plans and menus.
- Clear communication between the customer with a food allergy and restaurant staff is vital. To avoid mistakes when a customer asks about ingredients of dishes or safe foods, **write down on paper the allergens to be avoided and follow the plan for identifying these ingredients** at your establishment. **If you cannot verify all ingredients with absolute certainty, advise the customer that you are not sure. Never guess!** A customer with a food allergy is expecting to receive accurate information so that they can make an informed food choice.
- Eliminate all potential sources of cross-contamination. In the kitchen ensure that all food surfaces are cleaned

Priority Allergens and Alternative Names

The following is a partial list of alternative names for priority allergens. To become more familiar with priority allergens and the foods that contain them, visit:

<http://foodallergy.ca/about-allergies/food-allergens/>

Eggs: albumin, egg substitutes, globulin, livitin, lysozyme, meringue, many products with “ovo” in the name

Milk: casein, curds, delactosed whey, lactate, whey

Mustard: sinapis alba, brassica hirta, moench, canola protein, dijon mustard

Peanuts: arachide, arachis oil, beer nuts, cacahouette, kernels, nut meats, mandelonas, valencias

Seafood: all fish, crustaceans and shellfish

Sesame: benne, gingelly, seeds, sesamol, sesamum indicum, sim sim, tahini, tahini til, vegetable oil

Soy: bean curd, tofu, edamame, glycine max, kinanko, kouridofu, miso, natto, nimame, okara, soya, soja, soy protein, vegetable protein, tempeh, TSF, TVP, yuba

Sulphites

Tree nuts: almonds, brazil nuts, cashews, hazelnuts (filberts), hickory nuts, macadamia nuts, pecans, pine nuts (pignolias), pistachios, shea nuts or butter, walnuts

Wheat: atta, bulgur, couscous, durum, flour, farina, kamut, seltan, semolina, spelt (farro, dinkel), triticale, titicum aestivom, bran

properly, using hot water and commercial detergent. Use a separate area, clean utensils, cookware and cutting boards when preparing food for an allergic customer. At the table, ensure that the table top, containers on the table and utensils are clean and contaminant-free before seating guests.

- Be vigilant! Cross-contamination of even the smallest amount of allergen residue is dangerous for allergic consumers. For example, taking an egg or nuts off the surface of a prepared salad does **NOT** make the food safe for consumption by a person with an egg or nut allergy. The salad must be prepared from scratch ensuring that the ingredients have not been in contact with allergens.

When preparing foods consider the following:

- Be aware of all areas of the kitchen where cross-contamination can happen including equipment such as mixers, blenders, deep fat fryers, small ovens, refrigerators and storage areas.
- Remember that pre-packaged foods, including spices and sauces, may have ingredients that contain allergens. For example, chocolate chips may contain tree nuts, dairy or peanuts.
- Read the entire labels of the products you are using and make sure that they are included in your food plan. Especially look for what allergens are present in the “contains” or “may contain” statements.
- Try to keep ingredients in their original packaging so that labels can be examined. When storing ingredients in separate containers, keep ingredient labels attached to the container so that these can

What's in a label?
<p>If you are using pre-packaged foods, the ingredient label is a good source of information on allergen content.</p> <p>A label should list all ingredients. If you doubt that this is the case, do not take risks with allergy-related questions.</p> <p>Manufacturers may also include other information on a voluntary basis.</p> <p>Always read precautionary warnings, such as “may include peanuts.”</p> <p>Be wary of statements which state a product is “free from x.” Make sure to read the entire label to verify this statement.</p> <p>If ingredients on labels, particularly those coming from other countries, appear to be incomplete or lacking information, be extra cautious.</p> <p>Your ability to make decisions about the presence of allergens is only as good as the information you have available, so don't take any risks. If you cannot verify all ingredients with absolute certainty, advise the customer that you are not sure. Never guess!</p>

be examined.

- Ingredients in pre-packaged food can change without warning. Be sure to examine labels every time an item is purchased and keep information updated. If your establishment maintains an ingredient book, make sure this is kept up-to-date.
- Be aware of any product recalls for foods that may be in your kitchen. Chefs can sign up for email alerts sent from the Canadian Food Inspection Agency (CFIA) and additional information is

also available on the BC Centre for Disease Control’s website and from major suppliers.

When preparing food for a customer with a food allergy:

- Make sure that you are not substituting one allergen for another allergen without consulting the customer, for example, substituting dairy milk for almond milk (tree nuts) or soy milk, which are also priority allergens. Keep this information clear in recipes so that ingredients can be identified.
- The safest option is to prepare meals for allergic customers from scratch using fresh ingredients, separate equipment, and “off-line” in a dedicated area where there is less risk of cross-contamination. You may wish to have simple options available that can easily be prepared to accommodate customers with a food allergy; for example, foil wrapped chicken and baked potatoes with vegetables.
- **The following items have a high risk of cross-contamination:** food items purchased from bulk bins, food items without labels, food items produced on shared equipment, imported foods (for example, dates, spice mixtures, seasonings, chocolate bars and dry mixes). **Do not use these when preparing food for allergic customers.**

For more information on this topic, visit the following websites:

- Health Canada:
<http://www.hc-sc.gc.ca/fn-an/securit/allerg/fa-aa/index-eng.php>

- Canadian Food Inspection Agency – Understanding a Food Label:
<http://www.inspection.gc.ca/food/information-for-consumers/factsheets-and-infographics/food-allergies/eng/1332442914456/1332442980290>
- Food Allergy Canada:
<http://foodallergycanada.ca>



NOTES



Registration Form



Last Name		First Name		Middle Name	
Birthdate (YYYY / MM / DD)		Gender <input type="checkbox"/> M <input type="checkbox"/> F <input type="checkbox"/> X			
Mailing Address					
City				Postal Code	
Telephone		Email			
Occupation (check one) <input type="checkbox"/> Foodservice worker <input type="checkbox"/> Foodservice manager <input type="checkbox"/> Volunteer (school, church, team, etc.) <input type="checkbox"/> Student <input type="checkbox"/> Dietician <input type="checkbox"/> Other			Area of Employment (check one) <input type="checkbox"/> Foodservice industry <input type="checkbox"/> Volunteer sector <input type="checkbox"/> Care facility/Hospital <input type="checkbox"/> Educational institution <input type="checkbox"/> Unemployed <input type="checkbox"/> Other		
Language of Exam (check one) <input type="checkbox"/> English <input type="checkbox"/> Chinese <input type="checkbox"/> French <input type="checkbox"/> Japanese <input type="checkbox"/> Korean <input type="checkbox"/> Punjabi <input type="checkbox"/> Spanish <input type="checkbox"/> Vietnamese <input type="checkbox"/> Tagalog <input type="checkbox"/> German <input type="checkbox"/> Farsi <input type="checkbox"/> Arabic <input type="checkbox"/> Other (specify): _____					
Have you taken the FOODSAFE Level 1 course before? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, were you registered under the same name? <input type="checkbox"/> Yes <input type="checkbox"/> No If no, under what name? _____					
All personal information collected on this form is necessary for the administration of the FOODSAFE Program. The information will be used to determine if a person has taken and passed a FOODSAFE course, and will be used and disclosed in accordance with the <i>Freedom of Information and Protection of Privacy Act</i> .					
FOR INSTRUCTOR USE ONLY					
Exam Date		Exam Result <input type="checkbox"/> Pass <input type="checkbox"/> Fail Mark: _____%			
This course was offered by (name of organization)					
Instructor Name			Instructor Signature		

Answer Sheet

FOODSAFE Level 1 Exam Answer Sheet:

Circle the best answer for questions 1 to 50

- | | | | | | | | | | |
|-----|---|---|---|---|-----|---|---|---|---|
| 1. | A | B | C | D | 26. | A | B | C | D |
| 2. | A | B | C | D | 27. | A | B | C | D |
| 3. | A | B | C | D | 28. | A | B | C | D |
| 4. | A | B | C | D | 29. | A | B | C | D |
| 5. | A | B | C | D | 30. | A | B | C | D |
| 6. | A | B | C | D | 31. | A | B | C | D |
| 7. | A | B | C | D | 32. | A | B | C | D |
| 8. | A | B | C | D | 33. | A | B | C | D |
| 9. | A | B | C | D | 34. | A | B | C | D |
| 10. | A | B | C | D | 35. | A | B | C | D |
| 11. | A | B | C | D | 36. | A | B | C | D |
| 12. | A | B | C | D | 37. | A | B | C | D |
| 13. | A | B | C | D | 38. | A | B | C | D |
| 14. | A | B | C | D | 39. | A | B | C | D |
| 15. | A | B | C | D | 40. | A | B | C | D |
| 16. | A | B | C | D | 41. | A | B | C | D |
| 17. | A | B | C | D | 42. | A | B | C | D |
| 18. | A | B | C | D | 43. | A | B | C | D |
| 19. | A | B | C | D | 44. | A | B | C | D |
| 20. | A | B | C | D | 45. | A | B | C | D |
| 21. | A | B | C | D | 46. | A | B | C | D |
| 22. | A | B | C | D | 47. | A | B | C | D |
| 23. | A | B | C | D | 48. | A | B | C | D |
| 24. | A | B | C | D | 49. | A | B | C | D |
| 25. | A | B | C | D | 50. | A | B | C | D |

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