

FOOD HANDLER CERTIFICATION HANDBOOK

HOW TO PREPARE & SERVE FOOD SAFELY

2026 EDITION



Philosophy and Goals

Food Handler Certification Course

As people are paying more and more attention to food safety, governments have implemented strict regulations on what food people can safely eat.

However different countries and governments may have different health acts and regulations due to cultural sensitivity, diversity, inclusions or safety reasons.

After all, food practices that are considered safe in your home countries may not be considered safe in other places.

So today, we will learn important information about food safety in Canada. Which will help you do your job better.

This Course aims to provide assistance to Food industry workers to establish the food handler certification, and towards offering effective food safety education in the food retail/food services sectors.



Preface

This training manual is compiled by Chinese Food Service Safety Consultancy, according to information from sources and documents believed to be reliable and represent the best professional judgment of CFSSC.

Based on standards from the Ministry of Health, Health Protection and Promotion Act, R.S.O. 1990, c. H.7, Health Canada and The Canadian Food Inspection Agency.

This manual will cover the basics of handling food:

- Public Health Regulations
- Foodborne Illness (FBI)
- Microorganisms
- The Flow of Food
- Display, Serving, and Discarding
- Receiving and Storage
- Facility, Equipment and Pest Control
- Cleaning and Sanitizing
- Personal Hygiene
- Food Safety Management System

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CHAPTER ONE

PUBLIC HEALTH REGULATIONS

THE CONSTITUTION OF CANADA DIVIDED THE RESPONSIBILITIES OF THE GOVERNMENT INTO 3 LEVELS

FEDERAL

PROVINCIAL / TERRITORIAL

MUNICIPAL

The food service industry is regulated by legislation at all 3 levels of government (federal, provincial and municipal). All three levels work together to ensure the food safety of Canadians

Each Government level has its own management of the law and most of the health regulations are made by the provincial/territorial government.

Federal

The health and food safety of Canadians is governed by federal agencies and departments. Such as Health Canada and the Canadian Food Inspection Agency (CFIA).

The CFIA verifies industry compliance with federal acts and regulations, including the Food and Drugs Act, through activities that include the registration and inspection of abattoirs and food processing plants, and the testing of products.

Case study: romaine lettuce

In the fall of 2018, there was an E.coli outbreak linked to romaine lettuce from the Salinas Valley in California, U.S. On November 22, 2018, the Public Health Agency of Canada advised Canadians to not eat this lettuce, and told retailers and food service establishments to not sell or serve any romaine lettuce harvested from the Salinas Valley region.

Leafy greens, such as lettuce, can become contaminated in the field by soil, water, animals or improperly composted manure. Lettuce can also be contaminated by bacteria during and after harvest, from handling, storing and transporting the produce.

In Canada, individuals became sick between mid-October and mid-November 2018. There were 29 confirmed cases of E. coli illness investigated in Ontario (5), Quebec (20), New Brunswick (1) and British Columbia (3). 10 individuals were hospitalized and 2 individuals suffered from hemolytic-uremic syndrome, which is a severe complication that can result from an E. coli infection. No deaths were reported. Individuals that became ill were between 2 and 93 years of age. The majority of cases (52%) were female.

During the outbreak investigation, the CFIA advised industry not to import, distribute, sell, serve or use romaine lettuce from the suspect areas, and verified that these actions were implemented in the Canadian marketplace. Additional import control measures were put in place (requirement for a certificate), resulting in enhanced oversight by the CFIA at time of import. The Canadian outbreak was declared over on December 24, 2018, and the investigation was closed.

**FOR ALERTS AND RECALLS USE THE FOLLOWING LINK TO SIGN UP.
[HTTPS://RECALLS-RAPPELS.CANADA.CA/EN/SUBSCRIBE](https://recalls-rappels.canada.ca/en/subscribe)**

Provincial / Territorial

All provinces and territories have their own regulations for food preparation and food operations. They are included in legislation called an “ACT” .

Regulations are developed to define the acts and provide minimum standards that must be followed.

You can find these regulations in each provinces or territory’s own Public Health Act.

Legislation passed by the province or territory then gives local health department the power to enforce the CFIA and provincial / territorial acts.
Refer to Appendix for each provincial / territorial exclusive acts

Provincial and Local Health Units are the government departments that enforce health regulations. They inspect food operations to make sure they are following regulations properly with the help of Public Health Inspectors (also called Environmental Health Officers)

Each province / territory sets out the mandate to make regulations, programs and protocols which govern food premises. All local public health units are responsible for the conditions and safety under which food is held, prepared and served to the public. This is also the responsibility of the food premises owner/operator and employees.

All food premises in each province / territory must meet the minimum standards and Regulations on the design, equipment, toilet, food treatment, cooking temperature and staff hygiene of establishments.

Each province / territory has its own procedures required for setting up a food establishment. When planning and designing your establishment layout, please refer back to each individual province / territory own Public Health Act.

*Remember “Acts” and regulations can change between provinces and territories. The food handlers and operators must be aware of the requirements where they work.
Refer to appendix for each Province / Territory regulation in details

EACH “ ACT ” LAYS OUT THE POWERS OF THE MEDICAL OFFICER OF HEALTH AND THE PUBLIC HEALTH INSPECTOR.

Some of these are:

Power of Entry

The medical officer of health or a public health inspector may enter any place of business, during normal work hours, without a warrant, to carry out the duties under the Act. This would include routine inspections or the investigation of complaints of potential health hazards.

Power of Seizure

The medical officer of health or a public health inspector may seize anything suspected of being a health hazard for laboratory testing.

Power of Destruction

If a public health inspector determines that food is a health hazard, he/she has the power to destroy or dispose of the food immediately.

Power to Make an Order

Orders are issued by public health inspectors or medical officers of health to eliminate a health hazard, or to lessen the effects of a health hazard. They are in writing. They may also give instructions orally. Orders may also require a person or persons to stop doing something specific. In the case of food premises, this includes the power to order the premises to be closed until a health hazard is removed or fixed.

Public Health Inspectors (PHI)

PHIs enforce both the Acts and Regulations by routine compliance inspections of all food premises.

The regulation covers food premises, including cleaning and sanitizing, equipment, food holding temperatures, food handling, employee hygiene in food premises and a requirement for a trained food handler or supervisor on site during all hours of operation.

DURING INSPECTIONS, PUBLIC HEALTH INSPECTORS LOOK FOR:

Unsafe food handling practices

Issues of non-compliance with regulations

Investigation of foodborne illnesses and foodborne outbreaks

Investigation of consumer complaints

Action needed on food recalls, fires, floods and emergencies

If any immediate health hazards are seen during an inspection, the PHI could close the food premises and/or issue offense notices (tickets) under the Provincial Offences Act for not meeting the requirements of the Food Premises Regulation. A summons can also be issued instead of a ticket. A summons is a legal document requiring a person or corporation to appear in a Court of Justice. During a trial, a Justice of the Peace determines the fine or sentence if the person or corporation charged is convicted.

Public health inspectors will also conduct a risk assessment during the first inspection of each year, and assign each food premises a risk level of high, moderate or low.

This will determine if the establishment is inspected a minimum of three times, twice, or once a year, respectively. Low risk food premises that only offer for sale pre-packaged, non-hazardous food may be inspected a minimum of once every two (2) years.

The risk assessment takes into consideration various factors that may increase the risk of foodborne illness, such as the history of compliance, population being served, number of food preparation steps, presence of certified food handlers, and if a food safety management plan is in place. During the inspection, the public health inspector may also do a Hazard Analysis Critical Control Point (HACCP) audit.

The requirements for food premises inspection frequencies and risk assessments are outlined in each province / territory's **"Food Safety Protocol"** .

During Public Health Inspections, PHI will conduct a risk assessment which will determine the food premises inspection frequencies. These requirements are outlined in the table below.

	MINIMUM # OF YEARLY INSPECTIONS	EXAMPLES	RISK FACTORS CONSIDERED
HIGH RISK FOOD PREMISES	3	FULL SERVICE RESTAURANTS, LONGTERM CARE FACILITIES, HOSPITALS, DAYCARES, BANQUET FACILITIES	<ul style="list-style-type: none"> • EXTENSIVE FOOD PREPARATION/SERVING • VULNERABLE POPULATION SERVED • OPERATOR COMPLIANCE WITH REGULATIONS AND COMMITMENT TO FOOD SAFETY PRACTICES
MODERATE RISK FOOD PREMISES	2	FASTFOOD ESTABLISHMENTS, BAKERIES, HOTDOG CARTS, HIGH SCHOOL CAFETERIAS	<ul style="list-style-type: none"> • FEWER PREPARATION STEPS • VULNERABLE POPULATION SERVED • FOOD SAFETY PROCESSES IN PLACE TO REDUCE LIKELIHOOD OF FOODBORNE ILLNESS • GENERALLY HEALTHY POPULATION SERVED
LOW RISK FOOD PREMISES	1 OR ONCE EVERY 2 YEARS	CONVENIENCE STORES, BARS THAT DO NOT PREPARE FOOD	<ul style="list-style-type: none"> • ANY POTENTIALLY HAZARDOUS FOOD IS PRE-PACKAGED • NO FOOD PREPARATION

The importance of training programs

The primary purpose of food handler certification training is to comply with legal requirements and reduce the risk of foodborne illnesses.

Training ensures legality: Certified staff members onsite, ensures compliance to avoid failing inspections, fines, or shut down orders from regional authority.

How training help prevents illnesses: Well trained staff members with proper handling stops foodborne bacteria and cross contamination, protecting customers from foodborne illnesses.

Consumer trust: Visible hygienic and well trained staffs improve customer confidence and business reputation.

Municipal

The provincial/territorial government has enacted legislation authorizing the local municipal health bureau to create by-laws to deal with issues that are important to them that are not dealt with at the provincial or federal level.

Some municipalities create By-laws that have food safety requirements that are different from provincial/territorial requirements.

By-laws can be different in each municipality as each area has issues that are unique to their own situation.



City By-Laws

Customized by the local government for specific local needs.

Examples for facilities in Toronto, by-laws include:

- **Smoking bylaw control**
- **Licensing**
- **Garbage control**
- **Sewage disposal**
- **Building standards**
- **Zoning Municipal**

By-laws are enforced by municipal by-law enforcement officers.

Inspections

Public Health Inspectors can make an inspection at any time during your operation hours, they don't have to inform you when they are coming.

During an inspection of the establishment, we should actively and professionally cooperate with the Inspector and answer all questions honestly.

The Inspectors can give orders, tickets and summons to court, remove the permit and even close the establishment permanently.



During inspections some of the things PHIs would be looking for ...

Potentially hazardous foods are maintained at the required temperatures.

Example: Cooked poultry is stored or held for service outside the danger zone, at 4°C or below, or 60°C or higher .

Food is protected from contamination and adulteration.

Example: Food displayed for sale or service is protected from contamination by enclosed containers.

Food contact surfaces can be readily cleaned and sanitized.

Example: Any article or equipment that comes in direct contact with food is of sound and tight construction, kept in good repair, suitable for their intended purpose, and made of material that can be readily cleaned and sanitized. (Eg. durable, non-absorbent, non-toxic, smooth and easy to clean)

Ensuring good personal hygiene is being practiced by all employees.

Example: The food handler is clean and wearing clean outer garments while working with food. Food handlers wash their hands after hands are contaminated, before commencing or resuming work, including after using the washroom.

Cleaning and sanitizing of multi-service utensils to prevent harmful bacteria from spreading.

Example: Multi-service utensils must be cleaned and sanitized after each use.



Ensuring that owners/operators are maintaining the food premises.

Example: All floors, walls and ceilings are readily cleanable, kept clean and in good repair.

Ensuring presence of a trained food handler

Example: During all operating hours, operators must ensure there is at least one food handler or supervisor on site who has completed food handler training.

Posting results of inspections by the public health unit

Example: Operators ensure the results of any inspection conducted by a public health inspector are posted in accordance with the inspector's request.

Responsibilities

The responsibility for safe food belongs to everyone in your food premises, from the owner to the chef to the server to the dishwasher. Every person in your premises has a job to do, and part of that job is keeping your customers and the food you prepare or sell to them safe. As a food handler, it's your responsibility to know what the regulations and standards are and to follow them. You have a responsibility to provide safe food. (Responsibility of premises owner and employee)

In Review

This section introduced food safety, and the legislation in place to keep food safe.

The following topics have been covered:

1. Role of each levels of Government
2. Provincial / Territorial ACT
3. Public Health Inspectors for food safety
4. By-laws and Inspections
5. Responsibility of premises owner and employee

CHAPTER TWO

FOODBORNE ILLNESS (FBI)

WHY FBI IS SERIOUS, STATISTICS IN CANADA, IMPACT ON BUSINESS, CUSTOMER AND WORKER MAY BECOME ILL AND DIE, GREATER IMPACT ON VULNERABLE POPULATION, ALLERGIC REACTION, PROPER PROCEDURE FOR FBI COMPLAINT IS MADE, NOTIFYING MANAGER & LOCAL PUBLIC HEALTH & RECORD KEEPING

SOME SYMPTOMS ARE

- **STOMACH CRAMPS**
- **NAUSEA**
- **VOMITING**
- **DIARRHEA**
- **FEVER**

WHAT IS FOODBORNE ILLNESS (FOOD POISONING)?

Foodborne illness used to be called 'food poisoning,' but because more foodborne illnesses are caused by infection than poison, this has been changed.

Foodborne illness (FBI) is caused by eating or ingesting infected food.

When food is contaminated by bacteria, viruses, parasites or chemicals.

"Any of these things in food can be called a contaminant."



Symptoms can start soon after eating contaminated food, or they can occur up to a month or more later. How long it takes for the symptoms to begin will depend on:

- What caused the illness
- How healthy the person was before this illness
- The amount of contaminant the person ate

IMPACTS OF FOODBORNE ILLNESS

Foodborne illness doesn't just affect the person who gets sick. The average cost of foodborne illness outbreaks to Canadian taxpayers is estimated to be between \$12 and 14 billion every year. Some of these costs are:

HIGH-RISK GROUPS

Everyone has the potential to get sick. Regular adults may carry disease but show no noticeable symptoms, High-risk groups are (elderly, children, pregnant women and patients) their immunity is lower than the average person, even a small amount of infected food will make them unwell.

For these groups, foodborne illness can be very dangerous and even fatal.

*Every year, a total of about 4 million (1 in 8) Canadians are affected by a foodborne illness (Public Health Agency of Canada, 2016).

- Medical costs, such as doctor's visits, hospitalization and medications
- Investigation costs, like the health unit doing tests to confirm the type of foodborne illness
- Loss of productivity, including sick people missing work, and food premises having to close during an investigation
- Legal and higher insurance costs, if a food premise is sued by those who got sick

CAUSES OF FOODBORNE ILLNESS

THERE ARE FOUR CAUSES OF FOODBORNE ILLNESS:

- Chemical Contamination
- Physical Contamination
- Allergens
- Microbiological Contamination

A foodborne illness from food contaminated by bacteria, viruses or parasites is microbiological. Bacterial illnesses are one of the most common type of foodborne illness

(Will be covered in the next chapter Microorganism).

This section will cover chemical and physical contamination and allergens.

CONTAMINATION SOURCES

Chemical Contamination

- **Cleaning supplies**
- **Insecticide**
- **Toxins (already deteriorated utensils, tools)**

Symptoms usually happen fast, from 20 minutes to a few hours after eating the contaminated food. They usually start suddenly with the most common symptoms being nausea, vomiting, abdominal or stomach pain, and sometimes, diarrhea.

Metal Food Poisoning

Dissolved metal in food can cause chemical food poisoning. If an acidic food, like fruit juice, maple syrup or tomatoes, is stored or cooked in metal containers, the acid can cause the metal to dissolve. Lead, copper, tin, zinc, iron and cadmium are all possible sources of metal food poisoning.

Chemical Additives

According to Health Canada, a food additive is any chemical substance added to food during preparation or storage to achieve a specific technical effect, such as coloring, thickening, firming, or preserving food. When used correctly, these intentional chemical additives are not harmful to most people and can improve the appearance, taste, and shelf life of food. However, improper use or excessive amounts can lead to food poisoning.

Also many food additives can make a person sick if he/she is allergic to it.

Three additives well-known for allergic reactions are:

- Sulphites (used to maintain color and give longer shelf life)
- Monosodium Glutamate (MSG) (used to boost flavor)
- Tartrazine, also known as FD&C Yellow #5 (a yellow food coloring)

Food allergies and how to help customers with allergies are covered in the Allergens section.

Many food additives are regulated in Canada under the food and drug regulations under the Food and Drugs Act. You can find a list of all allowed food additives on the Health Canada website: www.hc-sc.gc.ca. Search “food additive dictionary.”

INCIDENTAL ADDITIVES

Poisonous chemicals like insecticides, rodenticides, and cleaning agents used in food premises can cause food poisoning if they accidentally contaminate food. This type of contamination is known as an incidental chemical additive. To ensure safety, such chemicals should be stored in their original containers or, if transferred to smaller containers, clearly labeled with the product name and contents. Proper storage, usage, and handling instructions must be followed to prevent food contamination. For example, some cleansers need to be rinsed off surfaces before food preparation to avoid foodborne illness. Additionally, chemicals should never be stored with food or left on food preparation surfaces.

PHYSICAL CONTAMINATION

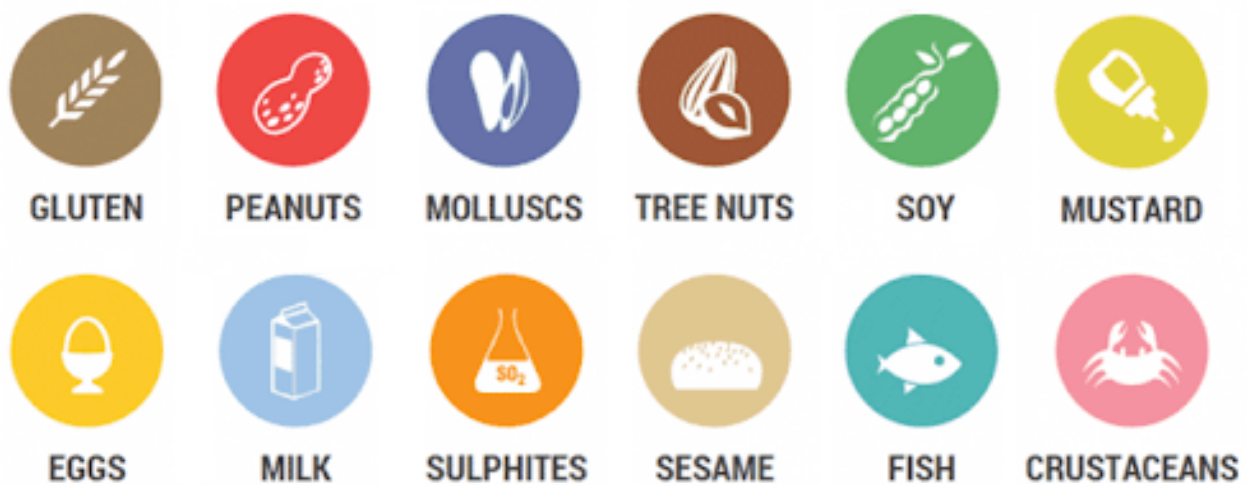
- **Environment (dust, insects ...)**
- **Human factors (hair, nails, earrings ...)**
- **Food source (bones, fish scales, feathers ...)**

These objects could cause anything from a small cut to possible choking. To keep this from happening you should:

- Put and maintain protective shields or covers on lights over food storage and preparation areas.
- Remove staples, nails and other objects from boxes and crates when food is received so they don't fall into the food.
- Avoid using glasses to scoop ice, because the glass may break in the ice. Use only commercial, food-grade plastic or metal scoops with handles.
- Avoid chilling glasses or any food items in ice that will be used in drinks.
- Avoid storing toothpicks or non-edible garnishes on shelves above food storage or preparation areas.

ALLERGENS

Food allergies or sensitivities affect many people, with common allergens including peanuts, shellfish, and eggs. Symptoms of an allergic reaction can occur within minutes or, in some cases, up to several hours after exposure to the allergen. In Canada, it's estimated that over 2.6 million people (7.5% of the population) have a food allergy. This means that, on average, one in every 13 customers at a food premises may have a food allergy.



FOR MORE INFORMATION ON EACH OF THESE, PLEASE SEE THE FACT SHEETS ON THE CFIA WEBSITE FOOD ALLERGIES AND ALLERGEN LABELING.

CFIA PRODUCT RECALL AND CONTAMINATION SITE ([SUBSCRIBE - CANADA.CA](https://recalls-rappels.canada.ca/en/subscribe))

[HTTPS://RECALLS-RAPPELS.CANADA.CA/EN/SUBSCRIBE](https://recalls-rappels.canada.ca/en/subscribe)

SYMPTOMS OF AN ALLERGIC REACTION COULD INCLUDE:

- Skin reaction: hives, swelling (face, lips, tongue), itching, warmth, redness
- Respiratory (breathing): coughing, wheezing, shortness of breath, chest pain or tightness, throat tightness, hoarse voice, nasal congestion or hay fever-like symptoms (runny, itchy nose and watery eyes, sneezing), trouble swallowing
- Gastrointestinal (stomach): nausea, pain or cramps, vomiting, diarrhea
- Cardiovascular (heart): paler than normal skin color/blue color, weak pulse, passing out, dizziness or light-headedness, shock
- Other: anxiety, headache, uterine cramps, metallic taste

Anaphylaxis

Anaphylaxis is a severe, life-threatening allergic reaction that can occur rapidly after contact with an allergen, often within minutes. Immediate treatment with an epinephrine auto-injector (e.g., EpiPen®) is crucial at the first sign of a reaction, as it can help reverse symptoms such as breathing difficulties. After administering epinephrine, the person must be taken to the hospital immediately.

For individuals with food allergies, avoiding allergenic foods is essential, as even a tiny amount can trigger a reaction. Therefore, they need to know the exact ingredients in their food. It's vital for food service staff to understand the seriousness of food allergies and be aware of the risks to help prevent potentially life-threatening reactions.

Communication

Knowing the ingredients included in all food options is critical when a person with an allergy dines out.

Some things the retail food service industry can do to help people with allergies are:

- Ask diners before they order if they have a food allergy.
- Ensure staff know how and where to access ingredient information if requested by a customer.
- Make sure the ingredients used in your menu options are documented and are complete, accurate and up to date.
- Make sure your food doesn't get cross-contaminated by other foods.
- Have an accurate and up-to-date recipe binder or electronic file.
- Avoid introducing new common allergens to recipes, when possible.
- Educate serving and kitchen staff on how to manage food allergy requests or questions (e.g. refer to manager or chef on duty). If you're not sure what's in a product, say so.
- Do not give incomplete or inaccurate information.

Use the following ways to let your customers and staff know what ingredients are in your food:

- Provide allergen management information online
- Update your company website to include your allergen management policy and procedures. Include information on menu options and ingredients, as well as who to contact directly with any allergy related questions.
- Print the ingredient information on your menus
- If you have a smaller menu that doesn't change often, this could work for you. If you have a large menu, or you change it often, this could be too costly.
- Use food allergy and sensitivity charts
- An allergy chart lets customers and staff quickly see which menu items have known priority allergens in them. These charts are designed to identify known allergens rather than all ingredients. You'll see a sample allergy chart on the next page.
- Use recipe binders or electronic file
- A recipe binder or electronic file would list all the menu items, with all ingredients listed for each, like a recipe cookbook. The list would include the ingredients of any prepared food used in the recipe, like a bottled sauce or a blend of spices. The binder/file should be changed whenever menu items are added, removed or updated. Daily menu items and special items should all be included.
- Choose a designated employee
- An employee on each shift would be designated to answer customers' questions. This employee would need direct access to the recipes and kitchen staff, and a clear understanding about the importance of ingredient information and potential for cross contamination. Servers would then have all questions answered by this employee.
- Check with guests in advance
- The organizer of a catered event should ask if any of their guests have special dietary needs or food allergies. Menus can either have allergens removed, or a special meal can be served to any guests in question. When printing banquet and catering contracts, a section called "food allergies or special dietary needs" should be added to address this.

Allergens Contaminations

All staff must be aware of the risks of introducing allergen contamination. Like cross-contamination, allergen contamination happens when food isn't properly separated. Cross contamination can occur by:

- Using equipment that hasn't been thoroughly cleaned and still has other food on it
- Contaminating (adulteration) of food, whether on purpose or by accident
- Using rework materials, like using pastry dough for two different recipes that may have come into contact with an allergen
- Using the wrong packages or wrong labels
- Not identifying all ingredients in food received from a supplier
- Using misleading names for foods or ingredients. For example, "Bombay duck" is actually a type of fish
- Carrying too many plates at one time, causing food on separate plates to touch
- Touching different types of food without handwashing in between

KEEP IN MIND OF THE FOLLOWING

How Allergens enter our body

- Through food and drink
- Through breathing
- Absorbed through the skin

How to avoid food allergies

- Avoid cross-contamination, allergen ingredients must be handled independently
- Give the guests sufficient and correct information.
- If a customer inquires whether an allergen ingredient is in a dish, and if you do not know you should tell them you are not sure and never guess.
- Use only ingredients that are approved for each recipe(no substitutions)

WHEN FOOD ALLERGIES HAPPEN, CALL 911 IMMEDIATELY

WHAT IS CROSS-CONTAMINATION?

WHEN SAFE FOOD, SUBJECT TO EXTERNAL FACTORS AND INFECTIONS, IS NO LONGER SAFE TO EAT.

HARMFUL SUBSTANCES TRAVEL FROM ONE SURFACE TO ANOTHER (FOOD HANDLER, EQUIPMENT, RAW FOOD CONTAMINANTS READY TO EAT FOOD)

Common causes of cross contamination

- **Food to food**

(Blood and juices from raw meat mixed with cook food)

- **People pass to food**

(The waiter did not wash his hands after using the toilet)

- **Utensil to food**

(Using the same knife to cut raw and cooked meat)

- **Water to food**

(Cleaning ingredients and utensils with unclean water)

Practices to avoid food Contamination

- Chemicals(cleaning materials) should be stored separately from food
- Do not store chemicals with utensils
- The chemical must be kept in its original packaging
- Highly acidic foods should not be stored in metal ware to avoid acid dissolving the metal into the food
- Preparing food must avoid wearing any jewelry
- Put on the hair restraints(hair nets, caps, chefs hats) to prepare food, thus protecting food from cross contamination.
- Avoid debris caused by the aging of the wall and ceilings to fall into the food

Complaints

If your food premises receives a complaint of a foodborne illness, take the complaint seriously. Do not give any medical advice, and you should call your public health unit to report any foodborne illness outbreak.

Record the details:

- Who got sick
- What food they ate and when
- What symptoms they had and when
- Write down everything you can about what happened

You should also:

- Talk to your staff
- Ask if any of them have or had the same symptoms
- Ask if any of them were ill when handling food
- Review how the food was prepared
- Save food samples from the meal that was eaten
- Don't give medical advice. Instead, refer to a physician or nurse practitioner.

In Review

This section introduced the different types of foodborne illness, and the impacts of foodborne illness.

The following topics have been covered:

1. What is Foodborne Illness
2. The symptoms of foodborne illness
3. Different Chemical Contamination
4. Physical Contamination
5. Allergens
6. Impacts of foodborne illness on people and business

CHAPTER THREE

MICROORGANISM

FOODBORNE ILLNESS CAN BE CAUSED BY MICROBIOLOGICAL, CHEMICAL, PHYSICAL HAZARDS, AND ALLERGENS, WITH MICROBIOLOGICAL CONTAMINATION BEING THE MOST COMMON CAUSE. MICROORGANISMS, WHICH ARE TINY GERMS INVISIBLE TO THE NAKED EYE, CAN COME FROM VARIOUS SOURCES LIKE FOOD, WATER, ANIMALS, OBJECTS, AND THE HUMAN BODY. CONTAMINATED FOOD MAY APPEAR NORMAL, SO UNDERSTANDING AND CONTROLLING THESE MICROORGANISMS IS CRUCIAL FOR FOOD SAFETY.

Remember

Microorganisms are tiny life-forms visible through a microscope.

Microorganisms are everywhere (food, water, humans, animals, the environment)

Sometimes our food may be contaminated by harmful microorganisms (pathogens) of bacteria, viruses, parasites, fungi, etc.

Microorganisms that make us sick are called 'Pathogens'

Microbial Contamination

- Harmful microbes
- The microbes exist in the natural environment
- The human body naturally carries and spreads the microbes

Microbial contamination has two distinct pathways through which microorganisms, such as bacteria, viruses, or fungi, contaminate food. Understanding these pathways is crucial for implementing effective preventive measures, such as proper hygiene, cleaning protocols, and food handling practices.

Direct Microbial Contamination

This occurs when microorganisms are transferred directly from their source to food.

Examples:

1. Raw meat or poultry juices dripping onto ready-to-eat foods in a refrigerator.
2. Contaminated hands touching food, such as a food handler not washing hands after using the restroom.
3. Infected animals or insects, such as flies landing directly on food and transferring pathogens.

Indirect Microbial Contamination

This involves microorganisms being transferred to food via an intermediary, such as surfaces, equipment, or utensils.

Examples:

1. Cross-contamination via cutting boards or knives, such as using the same knife to cut raw chicken and salad without washing it in between.
2. Improperly cleaned equipment, such as a meat grinder harboring bacteria from previous use.
3. Contaminated water used in food preparation or washing produce.

TYPES OF MICROORGANISMS

Bacteria

Bacteria are everywhere, most foodborne illnesses are caused by pathogenic (Bad Harmful Bacteria) bacteria. Some examples of pathogenic bacteria are:

- **Salmonella** Most commonly found in raw poultry, but also found in other meats, unpasteurized milk and raw eggs.
- **Campylobacter** Commonly found in poultry and meat. It can be carried by rodents, wild birds, household pets such as cats and dogs and can also be found in untreated water.
- **Listeria** Found in soil. People can get infected by eating dairy products, vegetables, and fish and meat products that are contaminated with the bacteria.
- **Escherichia coli** Lives in the intestines of animals and can be spread to the outer surfaces of meat when it is being butchered. E. coli can also be spread through contaminated water.
- **Clostridium perfringens** Can be found in high protein or starch-like foods such as cooked beans or gravies and is likely to be a problem in improperly handled leftovers.

Viruses

Viruses are extremely small, often too tiny to be seen with a standard microscope, and are found in nearly all life forms, including humans, animals, plants, and fungi. Unlike bacteria, viruses don't grow in food; they require living cells to reproduce. Foodborne illnesses caused by viruses, known as enteric viruses, enter the body through the intestinal tract. Symptoms typically appear suddenly and last for one to two days, with some lingering weakness. These viruses are highly contagious, often untreatable, and can be spread even by asymptomatic individuals. The most common way viruses enter food is through human hands, making handwashing crucial. Contaminated water, cross-contamination, and exposure to infected seafood or shellfish are other sources.

Examples of foodborne viruses include Hepatitis A, Avian flu, Norovirus and Rotavirus.

The virus is the smallest microbe, requires a host, usually by the food carrier to be spread around food. (transmitted from food handler to food)

Parasites

Parasites live on or in humans and animals, using them to grow. People can contract parasites through contaminated water or food washed with it, eating undercooked meat from contaminated animals, or cross-contamination.

Parasites, like viruses, do not grow in food. Symptoms of parasitic infections vary by the type of parasite but can include abdominal pain, diarrhea, muscle pain, coughing, skin lesions, and weight loss.

Examples of parasitic infections include:

- **Trichinosis (pork tapeworm):** Spread through raw or undercooked pork or wild game.
- **Anisakiasis (parasitic roundworm):** Spread through uncooked marine fish and raw fish dishes like sushi, sashimi, ceviche, or salmon.

Parasites are single or multicellular organisms that are parasitic in humans and animals and can pass through food, to avoid food poisoning, “Sushi Grade” fish in the market have been treated by freezing to -35°C to kill possible parasites and their eggs.

The best way to control the spread of parasites is through cooking.

Protozoa

Protozoa are a type of parasite that live in the digestive tracts of people and animals and can cause foodborne illnesses. They can enter food through contaminated water, surviving longer and being harder to remove from water than bacteria. Protozoa are more likely than other microorganisms to infect individuals who consume contaminated food or water. Cross-contamination can also spread protozoa to other foods.

Examples of foodborne illnesses caused by protozoa include:

- **Giardiasis** (beaver fever or backpacker’s diarrhea): Spread through contaminated water or food.
- **Cryptosporidiosis:** Spread through contaminated water.

Yeast

Yeast, commonly used in making bread and alcohol, can also spoil food by slowly consuming it. Signs of yeast contamination include bubbles, an alcoholic smell or taste, pink spots, or slime. Yeast can grow at most food storage temperatures but typically spoils food without causing illness. It thrives on sugar and moisture, making foods like jellies and honey particularly susceptible.

Mold

Molds play a role in producing items like cheese, certain wines, and antibiotics like penicillin. However, the molds commonly found in kitchens are the slimy, rotten, or fuzzy types that spoil food. While individual mold cells are tiny, mold colonies appear as visible fuzzy growths on food.

Some molds produce toxins called mycotoxins, which can cause serious illness or infections. It's impossible to determine by sight whether a mold is toxic.

Spoilage: Changes the sensory qualities of food - such as taste, smell, texture, and appearance. Making it unpalatable, but they generally do not cause illness.

Spoilage vs Food Safety (Quality vs Safety)

- Spoilage cause visible or odorous changes like slime, sourness, or rotting. Usually easy to spot, smell, or taste before consumption.
- Pathogens cause foodborne illness, leading to symptoms like severe gastroenteritis, fever, or worse. Typically invisible, odorless, and tasteless, meaning safe looking food can still make you sick.

Examples of mycotoxins include:

- **Aflatoxin:** Often found in nuts, peanuts, and peanut butter.
- **Ochratoxin A:** Often found in grain, coffee, and wine.

Mold can grow on nearly any food, at any storage temperature, and under various conditions. While freezing can prevent mold from growing, it won't kill existing mold cells in the food. The visible mold on food is just the surface indication; if the mold produces toxins, they are typically found beneath the surface.

Mold is similar to a plant, with the visible part akin to a flower and hidden roots spreading into the food, making it unsafe. The softer the food, the deeper the mold is likely to penetrate.

Fermented and moldy foods are likely to contain toxins, if found, please discard immediately.

HOW BACTERIA MAKE US SICK?

Bacterial infections

When food contaminated with living pathogenic bacteria is consumed, it can lead to an infection-type foodborne illness. Even a small amount of bacteria can cause an infection, depending on the type. After ingestion, the bacteria travel to the intestines, where they multiply. Symptoms typically appear one or more days after eating the contaminated food, often within three days, though some bacteria can take 10 days or even over two months to show symptoms. These symptoms usually develop slowly and can last for several days, with fever being a common sign of infection.

Common examples of this type of food poisoning include Salmonella, Campylobacter, and Shigella, among others.

Remember

Bacteria follow the food into the body, breed in the digestive system, causing fever, diarrhea, stomach pain

Bacterial toxins

Foodborne illness can also be caused by toxins produced by bacteria, rather than the bacteria itself. These bacterial waste products, known as toxins, are poisonous to humans and can lead to a type of foodborne illness called foodborne intoxication. Toxins are odorless and tasteless, and some cannot be destroyed by normal cooking temperatures, meaning that cooking contaminated food may not eliminate the risk.

Toxins can originate from bacteria growing in food or from bacteria on a person handling the food. Infections, cuts, burns, boils, and pimples all harbor bacteria, and if these bacteria or their toxins contaminate food, they can cause foodborne illness.

Toxin Symptoms

Foodborne intoxication symptoms can begin the same day or within a day or two of consuming contaminated food and can last up to two weeks. These illnesses are dangerous because toxins are poisons. A well-known example is **Clostridium botulinum** (C. botulinum), which causes botulism.

Symptoms of botulism include:

- **Nausea**
- **Vomiting**
- **Tiredness**
- **Dizziness**
- **Headache**
- **Double vision**
- **Dryness in the throat and nose**
- **Respiratory failure**
- **Paralysis**
- In some cases, Death

It's important to note that in foodborne intoxication, it's not only the bacteria itself causing illness, but the toxin produced by the bacteria also.

BACTERIA

Bacteria are dangerous for several reasons:

- They multiply rapidly at room temperature.
- They can live and reproduce in food.
- They are not killed by refrigeration or freezing.
- Their spores and toxins may remain harmful even after cooking.

Bacteria can be transported by water, food, and as "hitchhikers" on humans, insects, rodents, and objects like dishes, towels, and clothing. They thrive and multiply quickly under favorable conditions, which include the right temperature, moisture levels, and a food source.

Bacteria can double every 10-20 minutes under ideal conditions, which means they can reach dangerous levels very quickly.

Key factors that support microbial growth include:

- **Time and Temperature:** Bacteria multiply rapidly in the "Danger Zone" which is between 40°F and 140°F (4°C and 60°C).
- **Oxygen:** Many bacteria require oxygen to grow, although some can thrive without it.
- **pH:** Bacteria generally prefer neutral to slightly acidic environments. Extreme pH levels can inhibit their growth.
- **Moisture:** Bacteria need moisture to grow. Low moisture levels can prevent bacterial growth.
- **Protein:** Foods high in protein provide a rich environment for bacteria to thrive.

Spores

Some bacteria can form spores to survive extreme heat, dryness, or chemicals. These spores are a dormant, resting stage that can reactivate into active bacteria when favorable conditions arise. **Clostridium botulinum** (C. botulinum), which causes botulism, is an example of a spore-forming bacterium. If an infant ingests botulinum spores, they can grow into active bacteria in the intestines and produce toxins. This can also occur in adults with preexisting medical conditions affecting their intestines.

Bacteria Growth

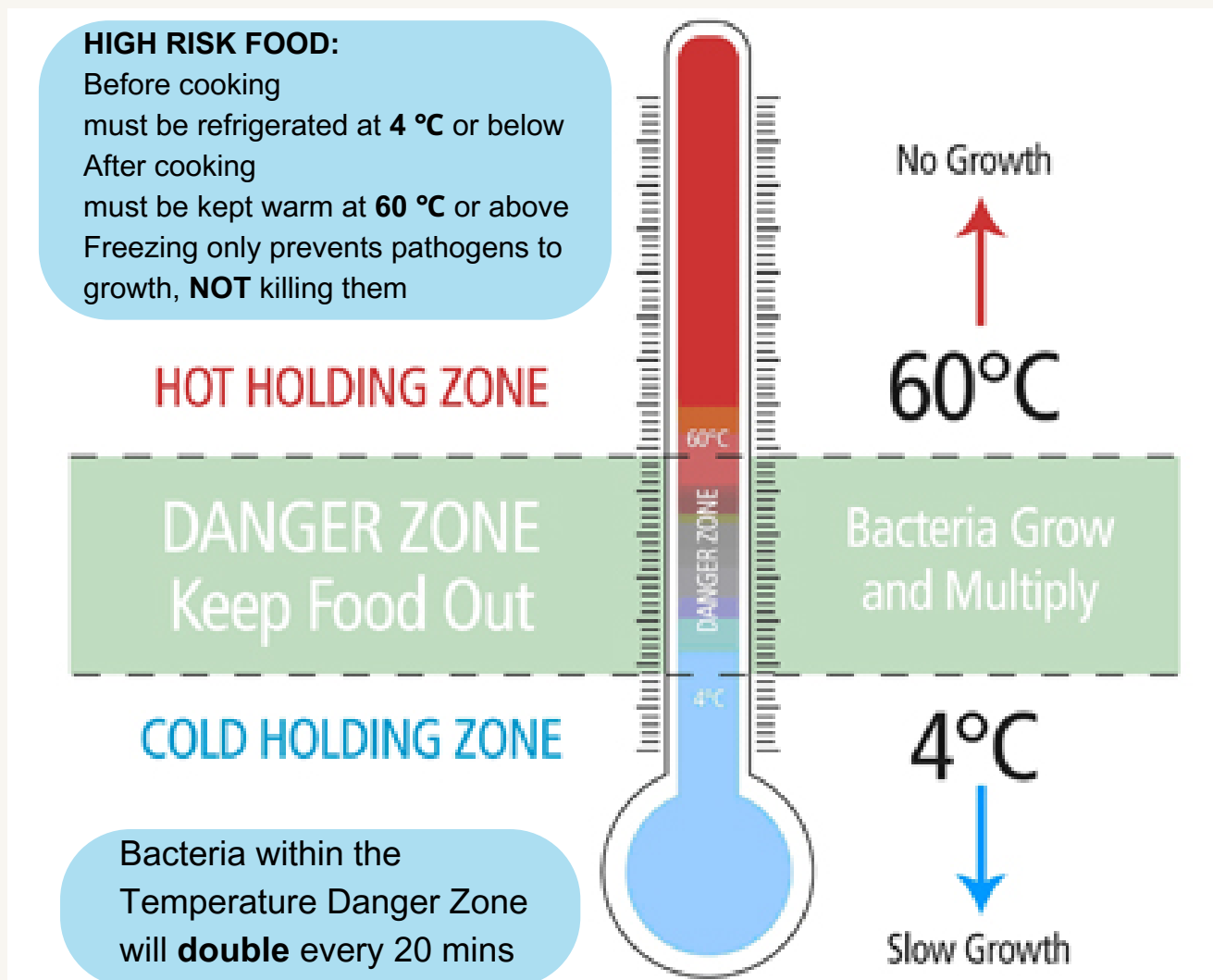
Time and Temperature

Temperature control is crucial for slowing bacterial growth in food. The temperature danger zone is between 40°F and 140°F (4°C and 60°C), where bacteria grow most rapidly.

To prevent dangerous bacterial growth:

- Heat food to at least 140°F (60°C) to stop bacteria from growing, but this won't kill bacterial spores or eliminate toxins.
- Chill food to 40°F (4°C) or below to significantly slow bacterial growth, but it won't kill bacteria, spores, or toxins.

Maintaining food outside the danger zone is essential for reducing the risk of foodborne illness.



Oxygen

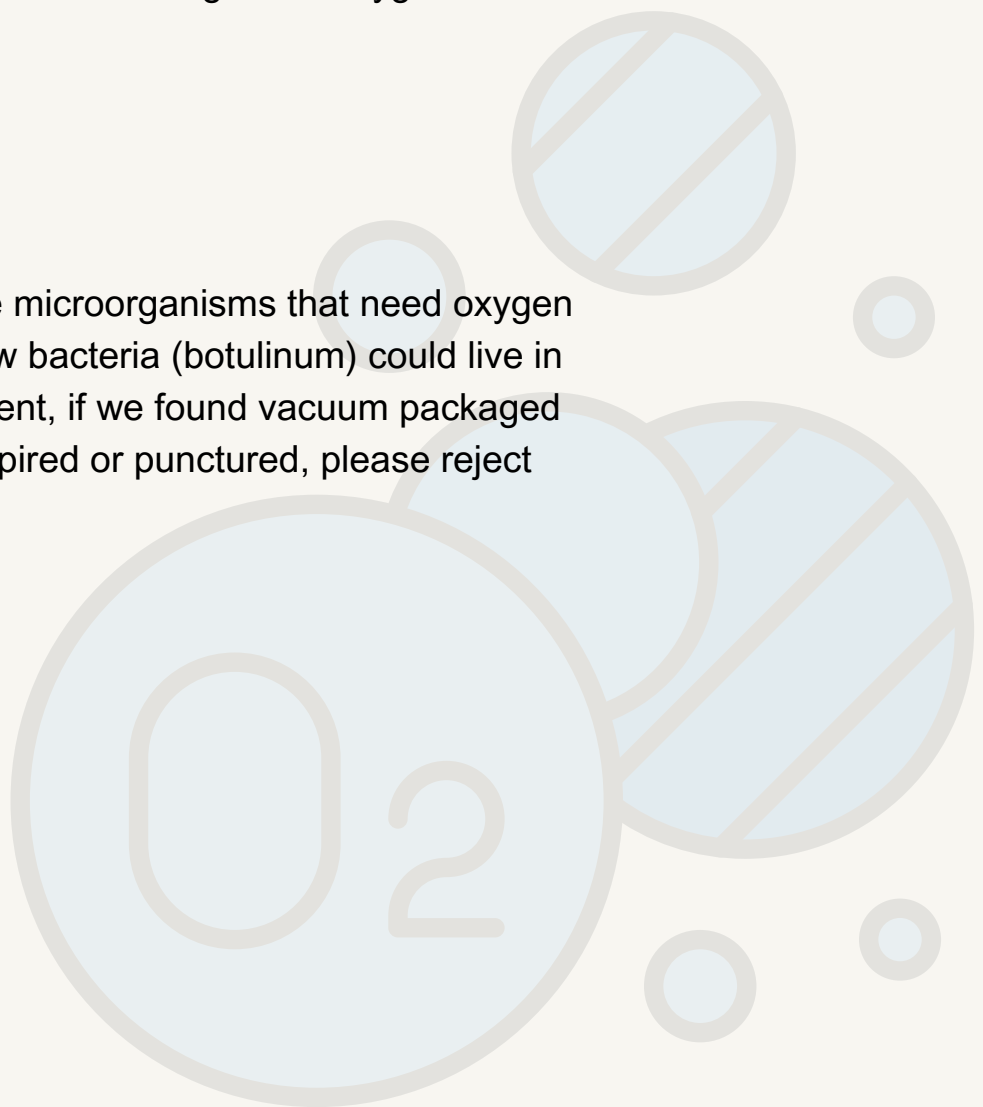
Bacteria that cause foodborne illness can be categorized based on their oxygen needs:

- **Aerobic Bacteria:** These bacteria require oxygen to grow. An example is Salmonella, commonly found in poultry products like chicken, turkey, and eggs.
- **Anaerobic Bacteria:** These bacteria thrive in environments without oxygen. An example is Clostridium botulinum, which can be found in improperly packaged cans or jars.

Aerobic bacteria are akin to aerobic exercise, which involves increased oxygen intake, while anaerobic bacteria grow in oxygen-free environments.

Remember

Aerobic bacteria are microorganisms that need oxygen to survive, only a few bacteria (botulinum) could live in a vacuum environment, if we found vacuum packaged and canned food expired or punctured, please reject immediately.

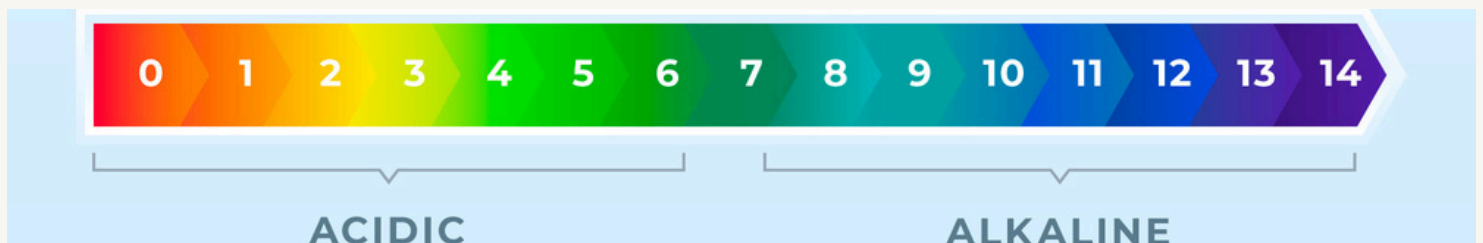


pH

The pH scale measures how acidic or alkaline a substance is, ranging from 0 to 14, with 7 being neutral. Pure water has a pH of 7.

- **Acidic:** pH below 7
- **Alkaline:** pH above 7

Pathogenic bacteria generally prefer a slightly acidic (around pH 4.6) to neutral environment for growth. Most foods are acidic, with a pH ranging from 2 to 7.



Moisture

Bacteria need moisture to grow, the higher the Water Activity (A_w) the faster they grow so they thrive in moist foods such as:

- **Meat: steak, hamburger, pork**
- **Dairy Products: milk, cheese**
- **Fish**
- **Eggs**
- **Vegetables**

Dry foods lack sufficient moisture for bacterial growth but can support bacterial survival. When water is added to dry foods, it can provide the necessary moisture for bacterial growth.

To make food safer:

- Freeze or dehydrate it to reduce available moisture.
- Cook food to kill bacteria.
- Add solutes like salt, sugar, or preservatives to lower the water activity and slow microbial growth.

Nutrients/Protein

Bacteria thrive on a good supply of food or nutrients, with protein being their main nutrient.

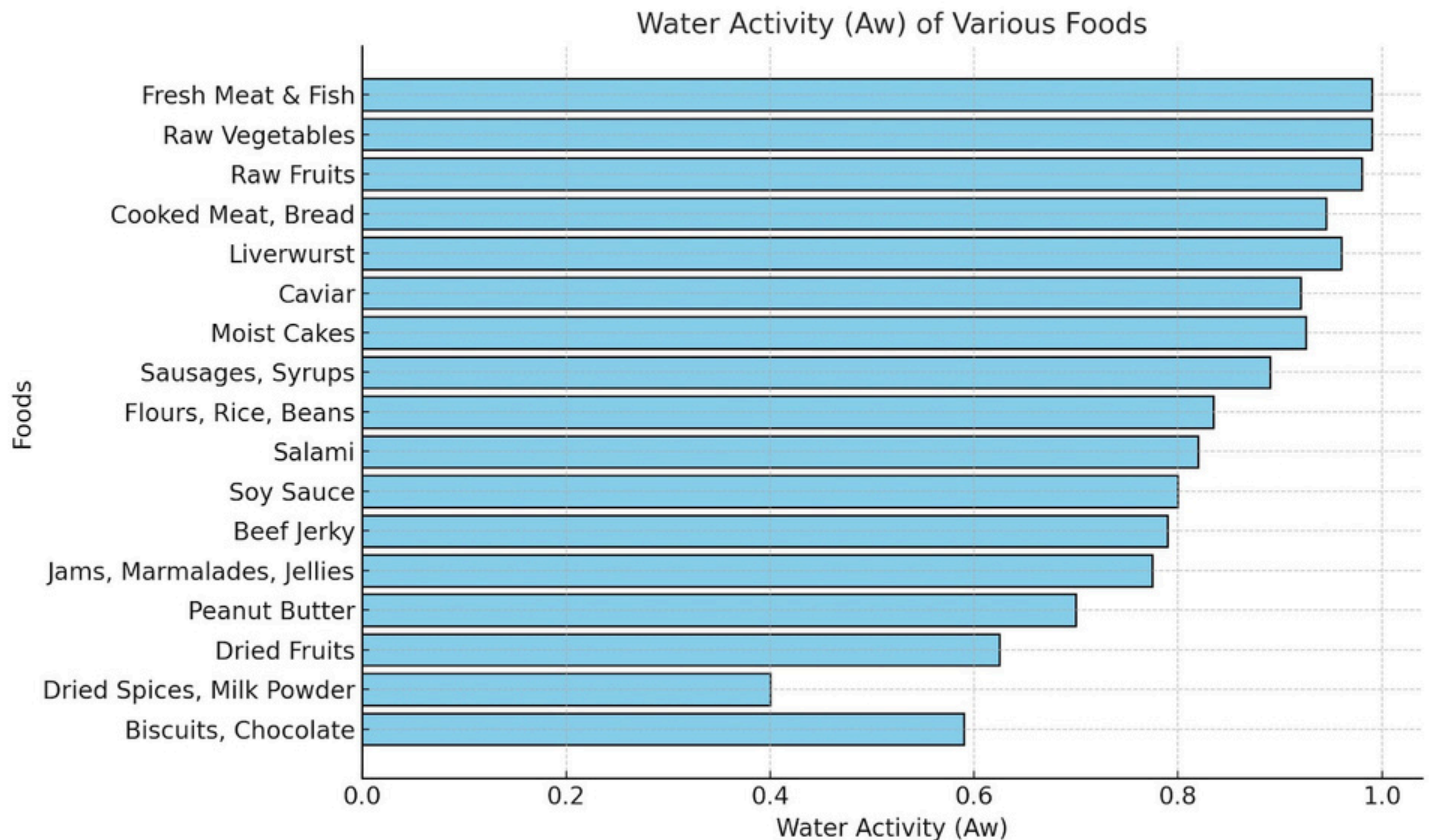
Foods rich in protein that support bacterial growth include:

- **Meat: steak, hamburger, pork**
- **Fish**
- **Poultry: chicken, turkey**
- **Eggs**
- **Dairy Products: milk, cheese**

Foods high in both protein and moisture are particularly conducive to bacterial growth.

Water Activity (A_w) is a measure of the availability of water in a food product for microbial growth and chemical reactions. It is expressed as a ratio and ranges from 0 (completely dry) to 1 (pure water).

Microorganisms require water for survival and growth, but they can only utilize water that is not bound to food molecules. The A_w level helps determine how prone a food product is to spoilage or contamination by microorganisms. A_w level of 0.85 or higher such as Raw meat, poultry, milk, and eggs. Is Also known as Potentially Hazardous Food.



Key Points:

- Foods with high water activity (e.g., fresh fruits, meats, and dairy products) are more susceptible to microbial growth.
- Foods with low water activity (e.g., dried fruits, grains, and salted meats) inhibit microbial growth.
- Dry Foods such as rice and flour do not contain the moisture necessary to grow pathogens, but pathogens can survive in them. They become Potentially Hazardous once moisture is added.

Examples:

- $A_w = 0.98$: Fresh meat or milk (supports most bacterial growth).
- $A_w = 0.7$: Dried fruits (inhibits most bacteria but may allow molds).
- $A_w = 0.5$: Crackers or powdered milk (prevents growth of most microorganisms).

Note: Reducing water activity through drying, salting, or adding sugar is a common preservation method.

POTENTIALLY HAZARDOUS FOODS

Potentially hazardous foods are those that support bacterial growth due to their high protein content and moisture levels. These foods require careful monitoring of time and temperature to prevent bacterial growth, toxin production, and spore formation.

Examples of potentially hazardous foods include:

- **Moist foods with a pH above 4.5**
- **Dairy Products**
- **Meat, Fish, Poultry, and Eggs**
- **Some Raw Vegetables and Fruits: e.g., bean sprouts, garlic in oil, cut melon, especially if they won't be cooked**

Any food containing these items can also be considered potentially hazardous. For example:

- **Cream-filled doughnuts**
- **Salads with sliced chicken**
- **Pasta dishes with meat sauce**
- **Casseroles with cheese**

Certain raw and cooked vegetables and fruits can support the growth of pathogenic microorganisms and are thus potentially hazardous. These foods are prone to contamination and have been linked to outbreaks, such as *E. coli* in spinach (September 2006) and *Salmonella* in fresh tomatoes (July 2008)

Remember

High-Risk Food

Food that can easily provide breeding ground for pathogenic organisms, and metamorphism will produce toxins (High moisture, high protein food)

- **Dairy products**
- **Eggs, poultry**
- **Pork, beef, lamb, fish**
- **Bean sprouts**
- **Shellfish**
- **Soy products**

Foods contain cut fruits, cooked rice, beans, potatoes and vegetables, soup, sauce, and juice. Microorganisms transmission between food, handler and environment, if we could maintain personal hygiene and wash hands correctly will effectively control the population of bacteria in our food, in order to prevent both direct and indirect transmission.

Carriers

Microorganisms can originate from various sources like food, water, animals, objects, or even the human body. They can be naturally present or introduced through carriers, which are people or things that transfer microorganisms into food. Since microorganisms are microscopic, they can be on people or objects without being noticed. People can unknowingly transfer germs to food during preparation, even if they feel healthy, as they might carry microorganisms without showing symptoms. Additionally, improper food handling can lead to cross-contamination, where microorganisms from one type of food are transferred to another.

Remember

Viruses, protozoa and parasites can't grow in food, but they can be transferred to food by a carrier. Bacteria can also be transferred to food by a carrier.

WHO CAN GET SICK

The likelihood of getting sick from eating contaminated food depends on several factors:

- **The person's health:** Individuals with weakened immune systems, such as the very young, elderly, pregnant women, or those with medical conditions, are more susceptible to illness.
- **The amount of pathogen (infectious dose):** The number of organisms required to cause illness varies by pathogen. For instance, more than 500 *Campylobacter* organisms, 100,000 *Salmonella*, or as few as 10 *Shigella* organisms can cause illness in a healthy person. Individuals with compromised immune systems need even fewer organisms to get sick.
- **The type of microorganism:** Some microorganisms, such as protozoa and parasites, are more likely to cause illness when ingested.

In Review

The following topics have been covered:

- What are Microorganisms
- The types of pathogenic microorganisms that cause foodborne illness: viruses, parasites, Protozoa, yeasts, mold and bacteria.
- The sources and preventions
- The foodborne illnesses these pathogenic microorganisms cause and the symptoms of illness
- What bacteria needs in order to grow: time and temperature, oxygen, pH, moisture and protein
- Potentially Hazardous Food
- Spore forming bacteria and growth
- Temperature Control and the Danger Zone
- Why some people are more likely to get sick than others when they eat contaminated food
- How carriers can transfer microorganisms to food



CHAPTER FOUR

THE FLOW OF FOOD

Understanding the flow of food

Design your restaurant as with the flow(single direction), understand the steps, understand our responsibility, to effectively avoid the possibility of foodborne illnesses.



Food Safety Sequence

The basic sequence of food preparation involves:

1. **Receiving and storage**
2. **Freezing**
3. **Thawing**
4. **Refrigeration**
5. **Food preparation**
6. **Cooking**
7. **Hot and cold holding**
8. **Cooling**
9. **Reheating**

Not all foods go through every stage or in this order. For instance, fresh vegetables might skip freezing and thawing, while salad ingredients may not be cooked or reheated. It's crucial to monitor and control food temperatures throughout these stages to prevent bacterial growth. Using a probe thermometer is essential for checking temperatures at each stage.

Thermometer

The thermometer helps us to check:

- The temperature when the ingredients are received
- The temperature when the ingredients are stored
- The temperature of cooking
- The temperature of the hot dishes when kept warm
- The temperature in cooling process
- Temperature of Cleaning and disinfection

Types of Thermometers

The Probe Thermometer

To ensure proper food temperatures:

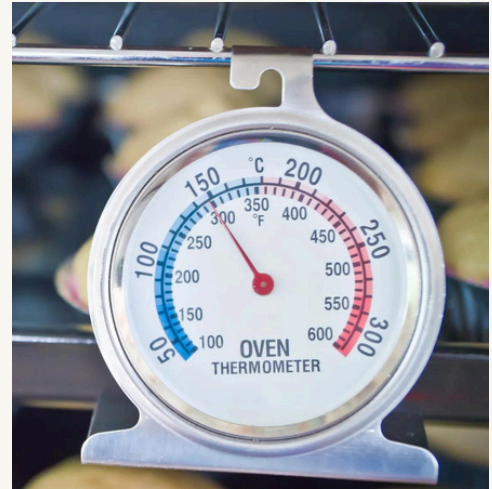
- Use a probe thermometer by inserting it into the thickest part of the food or the center if there's no thickest part.
- Wait at least 15 seconds for the reading to stabilize, then record the temperature.
- Clean and sanitize the probe with alcohol swabs or a sanitizing solution after each use to prevent cross-contamination.
- Avoid touching the bottom or sides of the food containers with the probe to ensure accurate readings.
- Do not leave the thermometer in food while cooking in an oven, microwave, or on the stove.



Oven and Grill Thermometers

Oven and grill thermometers are designed to endure high temperatures and offer a broad temperature range, making them essential tools for your kitchen. They are used inside ovens or grills to measure the internal temperature of these appliances. Key benefits include:

- **Testing Hot Spots:** They help identify areas with uneven heat distribution in ovens and grills.
- **Optimizing Food Placement:** They assist in finding the best spot to place food, ensuring consistent and reliable cooking results.



Deep Fryer and Candy Thermometers

Candy and deep fry thermometers are designed to withstand the high temperatures of boiling oil or sugar. They're ideal for tasks like bulk candy production or frying foods. Features include:

- **Built-in Clip:** Allows the thermometer to be attached to the side of a pot for continuous temperature monitoring.
- **Long Probe:** Can be submerged into liquids for accurate readings.
- **Easy-to-Read Scales:** Provides clear temperature indicators, making them user-friendly for both beginners and experienced cooks.



Refrigerator and Freezer Thermometers

Refrigerator and freezer thermometers are essential for monitoring the internal temperatures of these appliances to keep perishable items stored safely. They are built to endure cold environments and provide accurate readings even in low temperatures. They come in various styles:

- Cabinet Mount Thermometers: Attached to the interior walls of the appliance.
- Hanging Thermometers: Suspended inside the refrigerator or freezer.
- Standing Thermometers: Positioned on shelves or other surfaces within the appliance.

These options ensure you can choose the best model for your refrigerator or freezer layout.



Dishwasher Thermometers

Dishwasher thermometers are designed to handle high temperatures and moisture in commercial dishwashers to ensure proper sanitization. They come in various styles:

- Disposable Thermometers: Often attached to a dish rack or utensil basket, these are used for a single cycle.
- Dishwasher Probes: Inserted into a dish or utensil during the wash cycle to provide real-time temperature readings.

These tools help confirm that the dishwasher is operating at the correct temperature for effective cleaning and sanitization.

Thermometers cleaning and sanitizing

Always clean and disinfect your thermometer before and after each use. This practice helps prevent cross-contamination and ensures accurate readings for each new measurement. Here's a general approach:

- **Clean:** Use warm, soapy water to clean the probe or any part of the thermometer that has come into contact with food.
- **Disinfect:** After cleaning, use alcohol swabs or a sanitizing solution to disinfect the probe. This step is crucial for eliminating any remaining bacteria or contaminants.
- **Dry:** Allow the thermometer to air dry or use a clean, dry cloth before storing it.

Following these steps helps maintain the accuracy of your thermometer and ensures food safety.

Thermometer Recalibration

Regular recalibration of your thermometer is essential for accurate temperature readings. Recalibrate your thermometer and keep written procedures and records:

- **After Extreme Temperature Changes:** If exposed to very high or low temperatures.
- **If It Has Been Dropped:** To ensure accuracy is not compromised.

Even without these events, recalibrate regularly. The recommended method is the ice point method, which involves:

1. Placing the probe in a mixture of ice and water.
2. Adjusting the thermometer to read 32°F (0°C), the freezing point of water.

This method helps maintain the precision of your thermometer.

How to Recalibrate Ice point method

To calibrate your thermometer using the ice point method:

1. Prepare the Ice Slush: Mix crushed ice and water in a 50/50 ratio. This mixture will consistently be at 0°C (32°F), providing a standard reference temperature.
2. Insert the Probe: Place the thermometer probe into the ice slush, ensuring it doesn't touch the sides or bottom of the container. Wait for the needle to stabilize and read the temperature.
3. Adjust if Necessary: If the reading isn't 0°C (32°F), adjust the thermometer. For models with a calibration nut, use a small wrench to turn it until the thermometer reads 0°C (32°F). Keep the probe in the ice slush while making adjustments to ensure accuracy.
4. Adjust Other Models: For thermometers without a calibration nut, use the provided calibration mechanism or follow the manufacturer's instructions for adjustment.

How to Recalibrate Boiling point method

To calibrate a thermometer using the boiling point method:

1. Boil Water: Bring a pot of water to a rolling boil.
2. Insert the Probe: Place the thermometer probe into the boiling water, making sure it doesn't touch the sides or bottom of the pot.
3. Wait for Stabilization: Allow the thermometer to stabilize. The boiling point of water is 100°C (212°F) at sea level.
4. Check the Reading: Verify if the thermometer reads 100°C (212°F). If not, adjust it accordingly.
 - For Thermometers with Calibration Nuts: Use a small wrench to turn the calibration nut until the thermometer reads 100°C (212°F).
 - For Digital Thermometers: Follow the manufacturer's instructions to adjust the calibration settings.
5. Consider Altitude Adjustments: Note that the boiling point of water decreases as altitude increases. For accurate calibration at high altitudes, adjust the target temperature based on local boiling point changes.

Get to know the Center Temperature

The center temperature refers to the internal temperature of the thickest part of food, which is critical for ensuring it is cooked thoroughly and safely. This is especially important for items like roasts, casseroles, and large cuts of meat.

Here's how to accurately measure it:

1. **Insert the Probe:** Place the thermometer probe into the thickest part of the food, or the center if there's no clearly thickest part.
2. **Avoid Bones and Fat:** Ensure the probe does not touch bones, fat, or the sides of the pan, as these can give false readings.
3. **Wait for Stabilization:** Allow the thermometer to stay in place until the temperature reading stabilizes, which usually takes a few seconds.
4. **Check the Temperature:** Verify that the internal temperature reaches the recommended level for safe consumption based on food safety guidelines. and as recommended by the manufacturer.

Accurate measurement of the center temperature helps ensure that food is cooked evenly and to a safe temperature, reducing the risk of foodborne illnesses. Flexible packaging food, such as milk, and sauces we can use the package to wrap around the thermometer to measure.

Remember

In the process of Food Handling, starting from receiving to reheating, we will use the thermometer, in order to ensure that the food are at the correct temperature. Make sure the food is at the right temperature and we should check our refrigerator and freezer regularly.

Refrigerated (below 4 °C)
Frozen (below -18 °C)

CHECK EVERY 2 HOURS
display cooler (below 4 °C)
warming cabinet (above 60 °C)

FOOD SAFETY SEQUENCE

Receiving and Storage

It is important for food to be kept at the right temperatures while it's being shipped to you and when you are storing it in your food premises.

Freezing

To ensure frozen foods remain solid and safe:

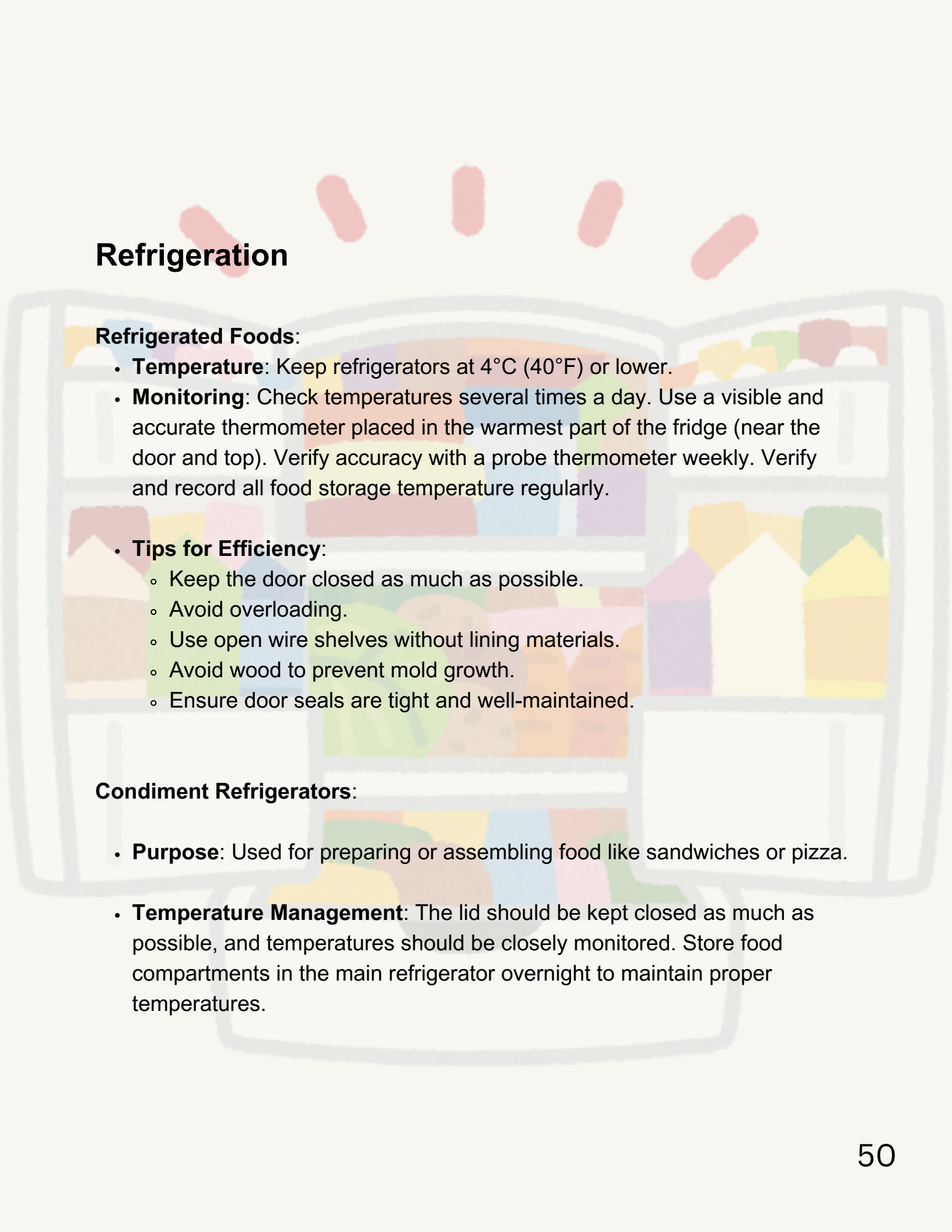
- **Monitor Temperatures:** Check the freezer temperature several times a day and use a probe thermometer weekly to verify the accuracy of the freezer's thermometer.
- **Maintain Freezer Efficiency:**
 - Keep the door closed as much as possible.
 - Avoid overloading the freezer.
 - Use open wire shelves without lining materials like cardboard or tin foil.
 - Ensure door seals are tight and well-maintained.

If food has been thawed, don't refreeze it without cooking it first, and remember freezing only prevents microbial growth but does not destroy all microorganisms.

Thawing

Never thaw foods at room temperature, as this can allow bacteria to grow quickly due to the food's outer layers reaching the danger zone temperature. Instead, use these safer methods:

- **In the Refrigerator (4°C/40°F):** Thaw food slowly in the fridge, which is the safest method. Allow a day or more for large items (10 hours/kg or 5 hours/lb.)
- **In Cold Running Water:** Use a large clean sink with continuous cold running water. Avoid splashing and sanitize the sink and utensils afterward. This method is faster but requires constant attention.
- **As Part of Continuous Cooking:** Thaw small portions of food like seafood or ground beef during cooking. This method is not suitable for large items.
- **In the Microwave:** Only use this method if you will immediately cook the food, as it can partially cook the food and is not effective for large items.



Refrigeration

Refrigerated Foods:

- **Temperature:** Keep refrigerators at 4°C (40°F) or lower.
- **Monitoring:** Check temperatures several times a day. Use a visible and accurate thermometer placed in the warmest part of the fridge (near the door and top). Verify accuracy with a probe thermometer weekly. Verify and record all food storage temperature regularly.
- **Tips for Efficiency:**
 - Keep the door closed as much as possible.
 - Avoid overloading.
 - Use open wire shelves without lining materials.
 - Avoid wood to prevent mold growth.
 - Ensure door seals are tight and well-maintained.

Condiment Refrigerators:

- **Purpose:** Used for preparing or assembling food like sandwiches or pizza.
- **Temperature Management:** The lid should be kept closed as much as possible, and temperatures should be closely monitored. Store food compartments in the main refrigerator overnight to maintain proper temperatures.

Food Preparation

When preparing food at room temperature, extra precautions are necessary due to the risk of bacterial growth in the danger zone (20°-50°C or 68°-122°F), especially at around 37°C (98°F). Bacteria multiply rapidly in this range,

Increasing the risk of foodborne illness. To minimize risk:

- **Time Limit:** Do not leave potentially hazardous foods at room temperature for more than two hours.
- Be aware that local jurisdictions may have different requirements.
- **For Large Amounts of Food:**
 - **Use Small Batches:** Prepare smaller portions to reduce the time food spends at room temperature.
 - **Pre-Chill Ingredients:** Use pre-chilled ingredients to lower the initial temperature of the food.
 - **Pack Food on Ice:** Keep food cool by placing it on ice.

Don't let foods be in the danger zone longer than necessary. If you need to leave your work station for any reason, put food back in the refrigerator until you can start with it again.

Cooking

To ensure food safety:

- **Cook Hazardous Foods:** Food mixtures containing hazardous foods (like dairy, meat, poultry, fish, and eggs) should be cooked to an internal temperature of at least 74°C (165°F). Use a probe thermometer to verify this temperature for at least 15 seconds.
- **Cooking Meats:**
 - **Solid Cuts** (e.g., steak): Surface bacteria are killed even if the center does not reach 74°C (165°F) because the outer layers are thoroughly heated.
 - **Ground Meats:** Since surface bacteria are mixed throughout, ground meats must be cooked all the way through to 74°C (165°F) to ensure all bacteria are eliminated.

Following these guidelines helps ensure that all potentially harmful bacteria are destroyed and the food is safe to eat.

COOKING FOOD FROM RAW		TEMPERATURE REQUIREMENT
 PORK		71°C(160°F)
 POULTRY WHOLE		82°C(180°F) at least 15sec.
 POULTRY PIECES /GROUND		74°C(165°F) at least 15sec.
 GROUND MEAT (NON POULTRY)		71°C(160°F) at least 15sec.
 FISH		70°C(158°F) at least 15sec.
 FOOD MIXTURE / RICE		74°C(165°F) at least 15sec.

Hot and Cold Holding

Holding food means keeping it at the right temperature once it's been prepared and until it's served. Food can be held hot, cold or at room temperature.

Holding Food Properly:

- **Hot Holding:**

- Purpose: Keeps food hot after cooking until it is served.
- Temperature Requirement: Maintain at 60°C (140°F) or higher.
- Examples: Buffets, hot dogs in carts, fast food in warming trays.
- Monitoring: Regularly check and record temperatures with a probe thermometer.

- **Cold Holding:**

- Purpose: Keeps food cold for service or display.
- Temperature Requirement: Maintain at 4°C (40°F) or lower, similar to refrigerator temperature.
- Monitoring: Regularly check and record temperatures with a probe thermometer.

- **Room Temperature Holding:**

- Room temperature falls within the temperature Danger Zone 4°C - 60°C (40°F - 140°F), making extended holding unsafe.
- Any perishable food sitting in the temperature Danger Zone for cumulative periods exceeding 2 hours must be discarded.

Tips:

Avoid overfilling containers.

Use metal containers for better cold conduction compared to plastic.

Store food in a refrigerated unit or on ice.

Move food into the refrigerator if it will be stored overnight

Cooling

Cooling foods too slowly is one of the leading causes of foodborne illness

Cooling Cooked Food Safely:

- **Cooling Process:**

- First Stage: Cool food from 60°C (140°F) to 20°C (68°F) within two hours.
- Second Stage: Cool food from 20°C (68°F) to 4°C (40°F) or lower within the next four hours.

- **Cooling Methods:**

- Shallow Pans: Transfer hot food to shallow pans (2-3 inches/5-7 cm deep). Partially cover to protect from contamination and allow heat to escape. Place on top shelves in the refrigerator and stir to speed up cooling.
- Large Containers: To cool faster, use:
 - An ice water bath
 - Stirring
 - An ice wand
 - Adding ice directly to the food
 - Dividing food into small quantities
- Monitor Temperature: Use a probe thermometer to ensure food cools quickly and stays out of the danger zone.

- **Cooling After Preparation:**

- Room Temperature Foods: Cool from 20°C (68°F) to 4°C (40°F) or less within four hours, including foods prepared at room temperature like salads.

- **Storage:** Once cooled, cover food tightly to prevent contamination and drying out. Label and date containers to facilitate FIFO (first in, first out).

Using these methods helps minimize the time food spends in the danger zone and reduces the risk of bacterial growth

Reheating

The safe internal temperature for reheating all leftover is 74°C (165°F) :

- **Temperature Requirement:** Bring the food to its minimum cooking temperature 74°C (165°F) and hold it at that temperature for at least 15 seconds.
- **Timing:** Achieve this temperature within two hours to minimize time in the danger zone.
- **Reheating Methods:**
 - High Temperature: Use the highest temperature possible to reheat quickly.
 - If use microwave - rotating / stirring food to distribute heat evenly. Allow food to rest for 2 minutes after removal from microwave.
 - Soups/Stews/Gravies: Stir and bring to a boil; reheat in small amounts for faster results.
 - Thermometer Use: Always check reheating temperature with a probe thermometer.
- **Avoid Hot-Holding Units:** Do not use hot-holding units for reheating, as they don't heat food quickly or to high enough temperatures.
- **Leftovers:** Discard leftovers after reheating; do not reheat leftovers of leftovers.

In Review

The following topics have been covered:

1. Thermometer (types, use, maintenance, cleaning and sanitizing)
2. The proper way to storage with freezing and refrigeration
3. Safe methods for thawing and preparing food
4. Safe temperatures for cooking meats and other hazardous food
5. How to safely hold food at hot, cold and room temperatures
6. Different methods of cooling food safely by minimizing time in the danger zone
7. Proper ways to reheating food

CHAPTER FIVE

DISPLAYING, SERVING AND DISCARDING

Food Displaying

Use a thermometer to monitor temperature to ensure foods are kept out of the Danger Zone. Regularly check and record temperatures with a probe thermometer.

Food Handling Practices:

- **Separation of Old and New Food:** Never mix old food with new food to prevent contamination. Old food may spoil faster and introduce contaminants to new food.
- **Cleaning Utensils:** After replacing a pan of food, send the pan and all utensils used with it for dishwashing. Use clean, sanitized utensils for the new food.
- **Sneeze Guards:** Always use protective shields (sneeze guards) to prevent contamination from airborne particles.
- **Utensil Handles:** Ensure utensil handles do not come into direct contact with the food.

You should always use new utensils and new food pans when replacing food on display.

Discarding old food before replacing with fresh food

You should always discard old food before replacing it with fresh food to maintain the safety, quality, and hygiene of food displays.

Key Reasons:

- **Prevents Spoilage and Contamination:**
 - Why: Old food is more likely to have begun the process of spoilage, which can introduce harmful bacteria, mold, or other pathogens.
 - Example: If you mix old food with fresh food, the bacteria from the spoiled portion can spread to the new food, increasing the risk of foodborne illnesses for consumers.
- **Maintains Food Quality:**
 - Why: Fresh food has a better texture, flavor, and appearance compared to food that has been sitting out for a long time.
 - Example: Replacing old food with fresh food without mixing ensures that customers receive high-quality meals, which is essential for customer satisfaction and the reputation of the food service establishment.
- **Avoids Cross-Contamination:**
 - Why: Mixing old food with new food can lead to cross-contamination, especially if the old food has been exposed to contaminants during its time on display.
 - Example: For instance, an old batch of salad that has been sitting out might have come into contact with utensils that were not properly sanitized. Mixing it with a fresh batch of salad could spread any contaminants.
- **Enhances Operational Efficiency:**
 - Why: By consistently discarding old food before adding new food, staff can maintain a clean and organized display, making it easier to manage and monitor food safety.
 - Example: A clean, well-maintained food display is easier to monitor for temperature control, appearance, and freshness, which improves overall food safety and operational efficiency.

Food Serving

Sanitary practices during food serving are crucial to prevent contamination and ensure that the food remains safe to eat. Contamination during serving can introduce harmful bacteria, viruses, or other pathogens, which may cause foodborne illnesses. Even if food has been safely prepared, improper handling during serving can negate those efforts and put consumers at risk. By adhering to sanitary practices, food service workers protect both the food and the health of those consuming it.

Examples of Sanitary Practices in Food Serving:

- **Using Clean Utensils for Serving:**

- Why: Contaminated utensils can transfer bacteria and viruses to food during serving.
- Example: Always use clean tongs, spoons, or serving forks for each dish. Use trays to serve and hold plate underneath with thumb on rim.
- Replace serving utensils if they fall on the floor or if they come into contact with other contaminated surfaces.
- Self-service: make sure handle of serving utensils do not touch food.
- Cover cutlery: invert glasses and cups

- **Avoiding Bare-Hand Contact:**

- Why: Direct hand contact with ready-to-eat food can introduce contaminants, even if hands appear clean.
- Example: Use gloves, tongs, or deli papers when serving food to avoid touching it with bare hands. Change gloves frequently, especially when switching between different tasks.

- **Preventing Cross-Contamination:**

- Why: Cross-contamination can occur when serving different types of food with the same utensils or when using contaminated surfaces.
- Example: Use separate utensils for each dish, especially when serving allergen-free or raw foods alongside cooked foods. Clean and sanitize serving surfaces between uses.
- Protection of catered food and delivered food.

- **Proper Handling of Dishware and Utensils:**

- Why: Handling dishware or utensils improperly can transfer contaminants from hands to food-contact surfaces.
- Example: Hold plates by the edges, avoid touching the eating surfaces of cutlery, and handle glasses by the base or stem. This minimizes the risk of transferring contaminants from hands to the parts of the utensils that come into contact with food or the mouth.

- **Using Sneeze Guards and Covers:**

- Why: Sneeze guards and covers protect food from airborne contaminants, such as droplets from sneezing or coughing.
- Example: Ensure that sneeze guards are properly installed over buffet lines or salad bars, and keep food covered until it is served to reduce the risk of contamination.

- **Proper Handling and Disposal of Single-Use Items:**

- Why: Reusing single-use items like disposable plates, cutlery, or gloves can lead to contamination.
- Example: Discard single-use items after they've been used, even if they appear clean, to prevent the spread of germs.
- Single-use items must be stored in a dry and clean area, away from contaminated areas such as disposal bins and food preparation surfaces.

- **Personal Hygiene of Servers:**

- Why: Food handlers can easily transfer bacteria or viruses to food through poor personal hygiene.
- Example: Servers should wash their hands frequently, avoid touching their face or hair while serving food, and ensure that their uniforms or aprons are clean.

By following these sanitary practices, those serving food can significantly reduce the risk of contamination, ensuring that the food remains safe and healthy for consumption.

Discarding

Any food that has been served but not eaten must be thrown out, Even if food looks like it hasn't been touched. You don't know for sure that it hasn't been, it could be contaminated and must be discarded.

Handling Leftover and Single-Use Items:

- **Discard Served Food:** Any food that has been served but not eaten must be thrown out, except for low-risk food in unopened packaging or containers.
- **Single-Use Items:** Disposable plates, plastic cutlery, or chopsticks must be discarded after use, even if they appear unused.
- **No Reuse:** Single-service items cannot be cleaned or sanitized properly, so they must not be reused.

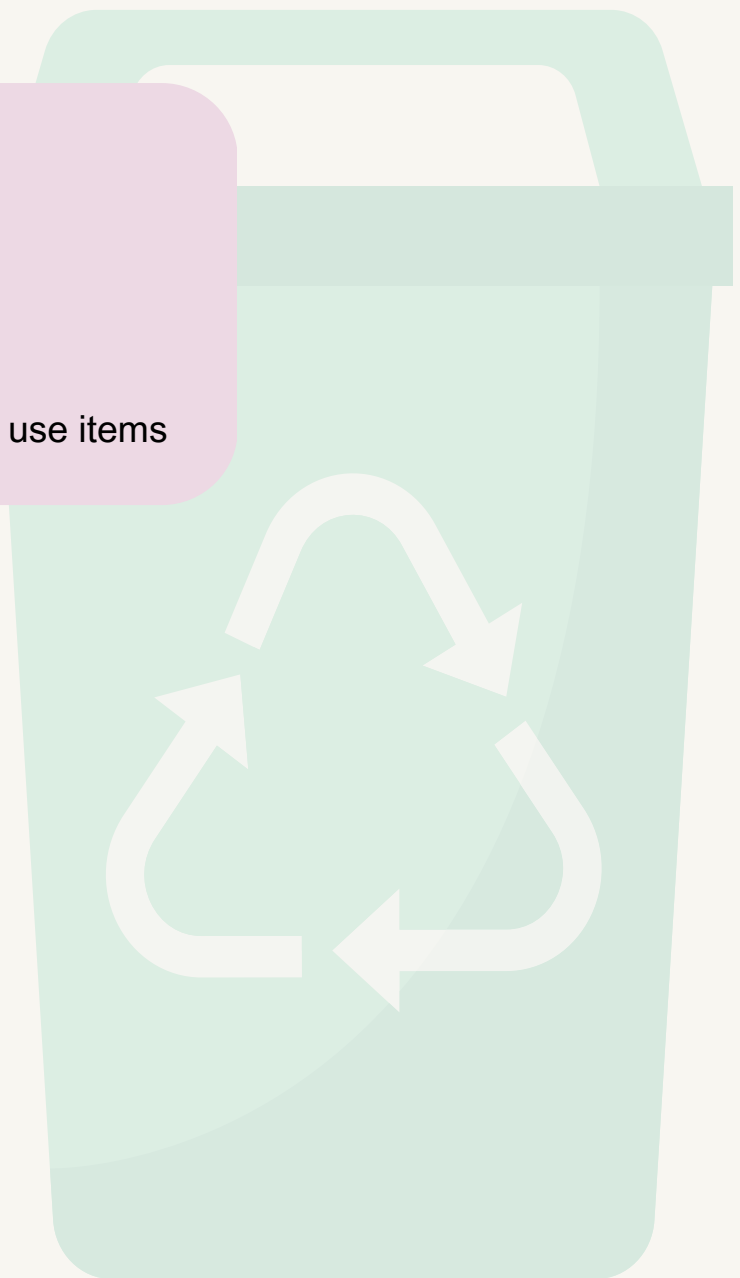
Remember

- Cold food to be refrigerated at 4 °C or below
- Hot food to be kept at 60 °C or above
- Frozen food should be kept at -18 °C or below
- Cold and warm food temperatures should be checked every 2 hours, use a thermometer to monitor temperature to ensure food are kept out of the Danger Zone
- Display Refrigerators and Warming Cabinet should be equipped with thermometers
- Allergens have to be separated with different utensils and tools
- Raw meat and cooked food must use separate tools and cutting boards or tools must be sterilized before use

- Old food and Single use containers must not be turned over even after cleaning and disinfection, should be discarded
- Cracked or damaged tools and utensils must be discarded
- Use clean damp cloth or paper towel with sanitizer to clean tables after use and/or change table linens between settings
- Maintain personal hygiene of service personnel
- If you have a cut or infection on your hands, must use band aid and gloves
- Wear a mask when you have a sore throat and/or a cold
- When sick, you must avoid contacting food and take the day off, because you could contaminate food and make customers, and co-workers sick.

In Review

- Food Display Controls
- Food Serving Techniques
- Sanitary Practices
- Discarding leftovers and single use items



CHAPTER SIX

RECEIVING AND STORAGE

Food safety is crucial at every stage of preparation and production. To ensure that the food served to customers is safe, it must come from a reliable source and be stored properly.

To prevent food contamination, the first line of defense is from receiving the food.

Shipping and Receiving

When receiving food at your premises, it's essential to inspect all deliveries to ensure they come from an approved source and are in good condition.

Key checks include:

- Ensuring delivery trucks are clean and free from contamination.
- Verifying proper shipping temperatures.
- Checking for dents, rust on cans, and any bulging, leaking, or stained packaging.
- Looking for signs of spoilage or pest infestation, like gnawed holes or insect wings.
- Confirming proper and intact labeling.
- Checking the manufacturer's 'best before' date and rejecting food if the date has passed.

These steps help ensure that the food you accept is safe for consumption. Always keep records of incoming shipments of food and if products were not accepted.

How to Receive Delivery

After inspecting and accepting food deliveries, follow these steps to keep the food safe:

1. **Remove Potential Contaminants:** Remove staples, nails, or other fasteners from packages to prevent them from becoming physical contaminants in the food.
2. **Check Invoices:** Compare the delivered items against invoices to ensure you receive everything you ordered and nothing extra.
3. **Temperature Control:** Quickly move refrigerated and frozen items into cold storage to maintain safe temperatures and prevent spoilage. Remember to maintain proper temperature control during transportation of foods.
4. **Prevent Contamination:** Move all food to storage areas promptly to avoid contamination.
5. **Maintain Records:** Keep all receipts and records for up to a year after purchase, as required.
6. **Inspected Sources:** Ensure food, especially items like meat, dairy, and eggs, comes from government-inspected sources.

These practices help ensure the safety and quality of the food you receive and serve.

How to Reject Delivery

Employees responsible for receiving goods should follow these steps if a shipment doesn't meet food safety standards:

1. **Know the Policy:** Be familiar with your company's policy on handling substandard shipments.
2. **Rejecting Shipments:** If rejecting all or part of a shipment, record the rejection in a delivery log.
3. **Delivery Log Details:** Include in the log:
 - Date of the rejection
 - Details of the food involved
 - Package identification (if available)
 - Standards not met
 - Type of adjustment or action taken

This process helps ensure that only compliant and safe products are accepted and maintains accurate records for quality control.

Meat, Poultry and Seafood

Only government-inspected meat, poultry, and fish/shellfish are allowed in food premises. These foods should have government approval markings on their packaging. Meat and poultry should be rejected if they are discolored, have an unusual smell, or feel slimy, sticky, or dry. They must be delivered either frozen or refrigerated.

Fish and shellfish should arrive either frozen solid or live at 4°C (40°F). Fish should be rejected if they have a strong fishy or ammonia smell, sunken or cloudy eyes, soft flesh that leaves a fingerprint, or if the shipping temperature is above 4°C (40°F).

Shellfish (clams, mussels, oysters) should be rejected if their shells are partly open and don't close when tapped, as this indicates they are dead. Lobster and shrimp should be rejected if they are soft and have a strong odor.

Eggs

Hen eggs used in food premises must come from a registered egg station and be graded. Consumers can buy ungraded eggs directly from producers for personal use but not for resale. Always inspect egg cartons for cracks, feathers, or feces, as these indicate the eggs are Grade C, which may carry a risk of Salmonella and cannot be used in food premises. Cracked eggs and Grade C eggs must be rejected. Liquid eggs must be pasteurized, and their packaging should not be broken or damaged.

Eggs and egg products should be delivered at 1-4°C (40°F) and rejected if they arrive at a higher temperature. Eggs shipped directly from an egg grading station can be delivered at 13°C (55°F). Acceptable eggs should be refrigerated immediately upon receipt and stored in their original containers. Non-hen eggs, like duck and quail eggs, must be clean, un-cracked, and transported or stored at 4°C or lower.

Dairy Products

Only buy pasteurized milk, and ensure that all dairy products like ice cream, cheese, sour cream, and yogurt are made from pasteurized milk. However, cheese made from unpasteurized milk in a licensed plant, or from animals other than cows or goats, is acceptable if it has been processed to destroy bacteria and prevent contamination.

Ice cream should be frozen, and most other dairy products should be stored between 2°-4°C (36°-40°F). Dairy products should not have a sour or moldy taste, or an unusual color or texture. Always check the 'best before' date, and ensure that dairy products are delivered at 4°C (40°F) or lower, rejecting them if the temperature is higher.

Canned Foods

Food premises are prohibited from using or accepting any home-canned foods due to the high risk of botulism. Commercially prepared canned foods are safe because they are heated to high temperatures and undergo regular quality control testing.

Do not accept metal cans with swollen sides or ends, seam flaws, rust, dents, leaks, or bad-smelling contents. Reject any can without a label. Once a metal can is opened, it should not be reused to store or cook food.

Fresh Produce

Inspect fresh fruits and vegetables for wilting, mold, or signs of pest infestation, and reject any products that are not in good condition. To prevent cross-contamination, ensure that refrigerated produce is stored below ready-to-eat foods and above raw meats, poultry, or seafood.

Dry Goods

Dry goods, including cereal, grains, nuts, rice, crackers, pretzels, sugar, and flour, should be received in dry, intact packages. Dampness or mold may indicate spoilage or bacterial growth. Inspect packages for holes or tears, which could signal infestation, and ensure the products are well within their 'best before' or expiration dates. Store all grain and bulk foods in closed metal or plastic containers to prevent contamination and keep pests out.

Storage

Different foods have varying storage needs—some can be stored at room temperature, while others require refrigeration or freezing to remain safe.

A guide in the appendix provides specific storage times for different conditions.

All foods should be stored on shelves, at least **15 cm (6 inches)** off the floor, to allow for proper floor cleaning and to protect the food from contamination and pests. If space is limited, consider smaller, more frequent deliveries or simplifying the menu.

Prioritize food storage in the following order:

- Potentially Hazardous Foods that require refrigeration
- Frozen Foods
- Fresh Foods that require refrigeration
- Dry Foods
- Chemicals and Non-food items

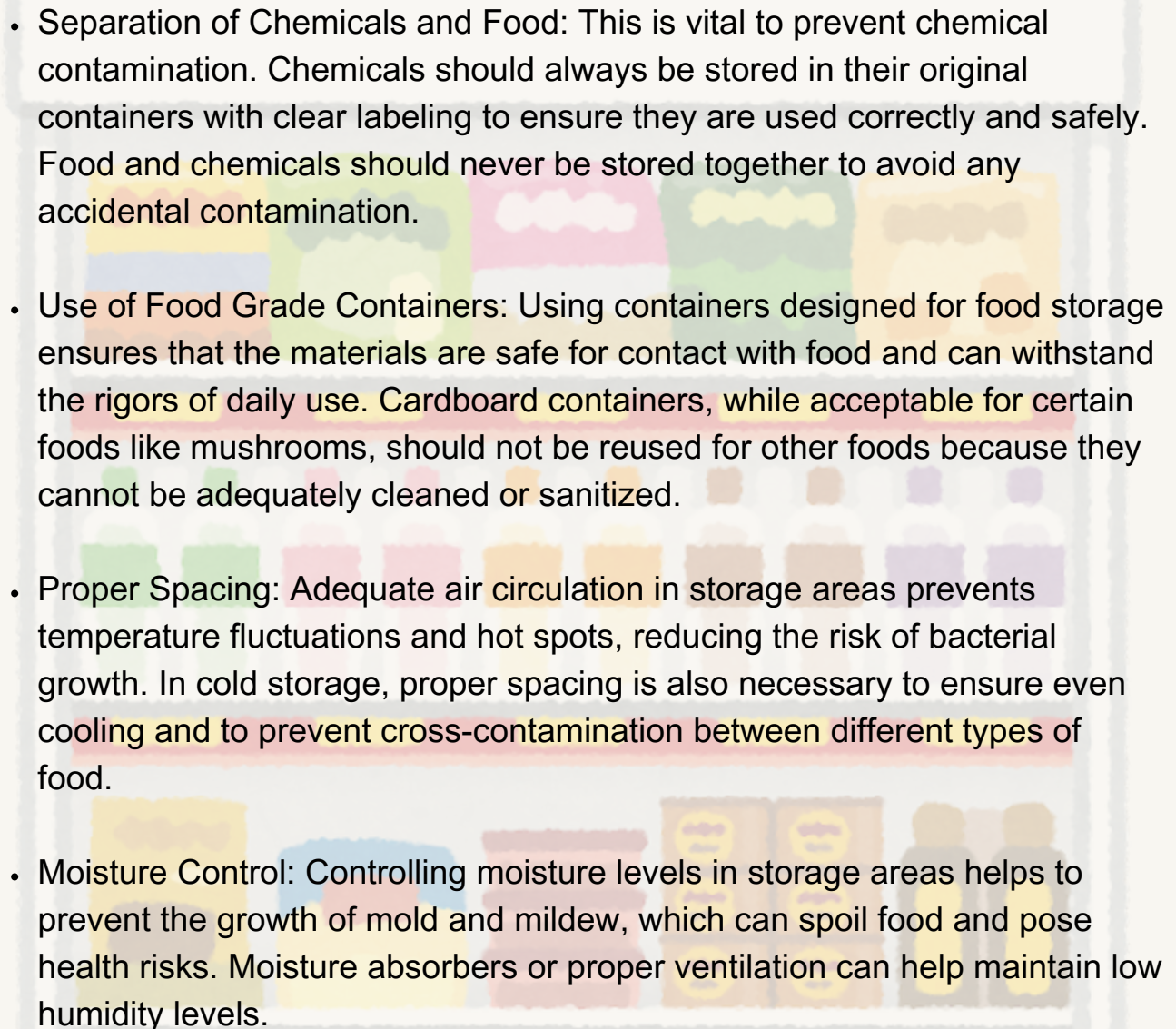
Never store food in washrooms, staff dressing rooms, corridors, or furnace rooms. Additionally, items like mops, pails, and brooms should be kept separate from food storage areas.

Storage Guidelines

These rules provide a strong foundation for food storage practices, which are essential for maintaining food safety and quality.

Here's a breakdown of each point:

- **Cleanliness:** Keeping storage areas clean is crucial to prevent contamination from dirt, dust, or pests. Regular cleaning routines should be established, and spills should be cleaned up immediately to avoid attracting pests.
- **Off-the-Floor Storage:** Storing food at least 15 cm (six inches) off the floor helps in cleaning the floor area and reduces the risk of contamination from pests and flooding. It also makes it easier to spot any signs of pest activity.

- 
- **Separation of Chemicals and Food:** This is vital to prevent chemical contamination. Chemicals should always be stored in their original containers with clear labeling to ensure they are used correctly and safely. Food and chemicals should never be stored together to avoid any accidental contamination.
 - **Use of Food Grade Containers:** Using containers designed for food storage ensures that the materials are safe for contact with food and can withstand the rigors of daily use. Cardboard containers, while acceptable for certain foods like mushrooms, should not be reused for other foods because they cannot be adequately cleaned or sanitized.
 - **Proper Spacing:** Adequate air circulation in storage areas prevents temperature fluctuations and hot spots, reducing the risk of bacterial growth. In cold storage, proper spacing is also necessary to ensure even cooling and to prevent cross-contamination between different types of food.
 - **Moisture Control:** Controlling moisture levels in storage areas helps to prevent the growth of mold and mildew, which can spoil food and pose health risks. Moisture absorbers or proper ventilation can help maintain low humidity levels.

Following these guidelines will help maintain food safety, reduce waste, and ensure the longevity of stored food.

Stock Rotation

To ensure stored food remains safe and fresh, follow these guidelines:

- **FIFO (First In, First Out) Rule:** This is a fundamental principle in food storage that ensures older products are used before newer ones, reducing the risk of spoilage. Properly rotating stock based on expiration or 'best before' dates helps in maintaining the freshness of food products. Products without these dates should be dated when they're received. New products should be put behind older products to make sure that older products are used first – the first product you received (in) is the first product you use (out).
- Adhere to recommended storage times for refrigerated, frozen, and dry goods, ensuring all items are dated. Any foods showing any signs of spoilage should not be used.
- Avoid overstocking to prevent food waste.
- Check manufacturer's best before date, keep near-expiration items separate from other foods. Foods passed their expiry date must be discarded immediately.

Remember

- **Must purchase from a government approved supplier**
- **When the truck arrived, check the food if it's at the required temperatures**
- **Keep record of incoming shipment of food and if any products were not accepted**
- **refrigeration food must be at 4 °C or below**
- **Frozen food are must be at -18 °C or below**
- **Pest or mouse bite marks are not acceptable**
- **Package damaged are not acceptable (Canned goods should be rejected if they are Swelling, Rusting, or missing labels)**
- **Moldy food are not acceptable**

Record time and temperature of receiving, plans to restock regularly, avoid mistreating the food which need to be refrigerated.

- **All ingredients should follow First-In First-Out method to be use**
- **Avoid cross-contamination, cooked and ready to serve food should put on the upper part of the refrigerator, raw meat should be placed lower part of the refrigerator**
- **Make sure you have adequate refrigerated space for your needs, Do not packed too full in the refrigerator to avoid uneven temperature**
- **Dry goods such as rice and flour should be placed in sealed containers**
- **Shelf should be waterproof material, the distance from shelf bottom to ground surface should be 15 cm, the shelf back to the wall should be 5 cm for easy to clean and pest control.**
- **Chemicals must be clearly labeled and must be stored separately from the food**
- **Temperature controlled rooms and compartments equipped with accurate indicating thermometers**
- **Containers should be dated and store according to the best before date**

In Review

The following topics have been covered in this section:

- **Receiving and Storage**
- **How to Receive and Reject deliveries**
- **Different shipping and storage requirements for different types of foods**
- **Storage Guidelines**
- **Storage Rotations and First In First Out (FIFO)**

CHAPTER SEVEN

FACILITY, EQUIPMENTS AND PEST CONTROL

Facility

A well-designed kitchen layout reduces risks of cross-contamination, temperature abuse, and hygiene issues. Key points include:

- **Easy Cleaning and Good Flow:** Design premises to be easy to clean and ensure a smooth flow for people and food products to minimize cross-contamination, temperature abuse, and hygiene issues.
- **Convenient Handwashing:** Place handwashing sinks in accessible locations to encourage frequent use.
- **Proximity of Refrigeration:** Position refrigerators near food preparation areas to keep food properly stored until needed.
- **Review Plans:** Submit plans or blueprints for building or renovation to the public health unit for review to avoid costly changes after construction.

For effective food safety, ensure your premises have:

- **Cleanliness:** Keep the building clean and maintain all areas.
- **Proper Lighting:** Adequate lighting helps with cleaning and safety.
- **Good Repair:** Regularly repair any damage to maintain hygiene and safety.
- **Proper Ventilation:** Ensure good airflow to reduce moisture and contamination.
- **Pest Control:** Keep the building pest-free to prevent contamination.

Additionally, focus on:

- **Flooring:** Use tight, smooth, and non-absorbent materials.
- **Walls and Ceilings:** Ensure they are easy to clean and repair any damage promptly.
- **Maintenance:** Regularly check and replace water-damaged or broken ceiling tiles.

Garbage Control

Garbage containers inside food premises should be easily accessible and plentiful to prevent overfilling. They should be emptied regularly to maintain sanitation. Containers should have lids or covers to prevent odors, pests, and contamination, and they should be cleaned and sanitized after each use. Outdoor garbage containers should be pest-proof and contain odors and hazards, with any spills or leaks cleaned up immediately.

Liquid waste - Must disposal of waste water in a sanitary manner and prevents pooling on the ground.

Solid waste - Containers must lined with plastic bags of sufficient size to collect solid waste and empty at least at the end of each day or when full.

Handle liquid waste in restaurants by separating fats, oils, and grease from regular wastewater and using licensed contractors for oil and grease removal.

Cooking Oil: Pour used cooking oil and hot grease into designated, sealed waste grease buckets then transfer to outdoor recycling bin and schedule regular professional disposal.

Grease Traps: Clean and service grease trap or interceptors routinely to stop blockages and keep waste water flow properly.

Mop Water: Empty dirty mop water only into designated utility sinks connected to the sanitary sewer system, never into outdoor ground drains or storm sewers.

Keep Outdoor Bins Covered: Keep outdoor grease storage and waste container lids tightly closed to prevent rainwater from mixing with leaks and creating polluted runoff.

Maintain Compliance Logs: Keep detailed written receipts and maintenance logs of your grease trap servicing and oil pickups for local health and environmental inspectors.

Improper grease disposal from restaurants and food service establishments can cause serious problems in the municipal sewer system, including sewage backups into businesses and homes, and potential interruption of business operations

Handle solid waste by reducing, safe storage, and proper disposal.

Manage inventory: Use the first in first out method (FIFO)

Dangerous solid waste: Place broken glass or sharp items into puncture proof, dedicated containers instead of standard trash bag.

Garbage bin: Always line indoor and outdoor bins with heavy duty garbage bags and keep lids tightly closed to keep pest away.

Equipment

Ensure equipment is properly designed, constructed, located, operated, maintained, and cleaned to prevent contamination.

All equipment should be made of corrosion-resistant and non-toxic materials. Your equipment needs to be cleaned often enough to keep it from getting a buildup of food residue or any other contaminants like dust or debris.

Equipment that's used without breaks at room temperature or used with hazardous foods needs to be cleaned and sanitized at least once every four hours and between being used with raw and ready-to-eat foods.

To prevent cross-contamination in the kitchen. All equipment must be washed, rinsed and sanitized often, especially between being used with different foods.

- **Clean Equipment:** Wash, rinse, and sanitize equipment frequently, especially between uses with different foods.
- **Separate Raw and Ready-to-Eat Foods:** Avoid cross-contamination by using separate equipment, utensils, cutting boards, and preparation areas for raw and ready-to-eat foods.
- **Use Color-Coded Tools:** Employ color-coded utensils and cutting boards for raw and ready-to-eat foods to reduce the risk of contamination.
- **Immediate Cleaning:** If separate tools aren't available, promptly wash, rinse, and sanitize any surfaces or equipment that come into contact with raw food.

Equipment Care

Proper use and care of equipment are crucial to prevent equipment cross-contamination:

- **Sanitizing Solution:** Keep a sanitizing solution on hand, mixed to the proper strength, in a bucket or labeled spray bottle.
- **Wiping Cloths:** Soak wiping cloths in a sanitizing solution to prevent bacterial growth.
- **Cutting Surfaces:** Replace cutting surfaces with cracks or crevices, as they cannot be properly cleaned.
- **Meat Slicers:** Disassemble and thoroughly clean and sanitize meat slicers after each use. If used multiple times a day, clean them throughout the day.
- **Utensils:** Change utensils frequently and replace any that fall on the floor with clean ones. Do not reuse dirty utensils.
- **Can Openers:** Clean can opener blades regularly, as they come into contact with food.

Pest Control

Insects and rodents are more than just a nuisance in food premises. Pests can contaminate your food supplies. They can damage your building by causing electrical or fire hazards and creating holes in the building structure.

Cockroaches

Cockroaches can survive with little food and water and they can survive and reproduce in any dark, warm, humid and hard-to-clean places.

Thus cockroaches are very difficult to eliminate once they infest an area.

Here's what you need to know:

- **Survival and Reproduction:** Cockroaches can survive on minimal food and water for up to two years. A female can lay over 500 eggs, which are protected by an egg case.
- **Preferred Hiding Spots:** They thrive in dark, warm, moist, and hard-to-clean areas, including behind refrigerators, in sink and floor drains, around hot water pipes, in electrical equipment motors, under shelf liners and wallpaper, and in delivery boxes and bags.
- **Signs of Infestation:** Cockroaches emit a strong oily odor and their feces resemble large grains of pepper. They feed on organic materials and lay eggs in the corrugated sections of cardboard.
- **Behavioral Cues:** Seeing cockroaches in well-lit areas often indicates a severe infestation, as they typically avoid light and search for food and water in the dark.

Flies

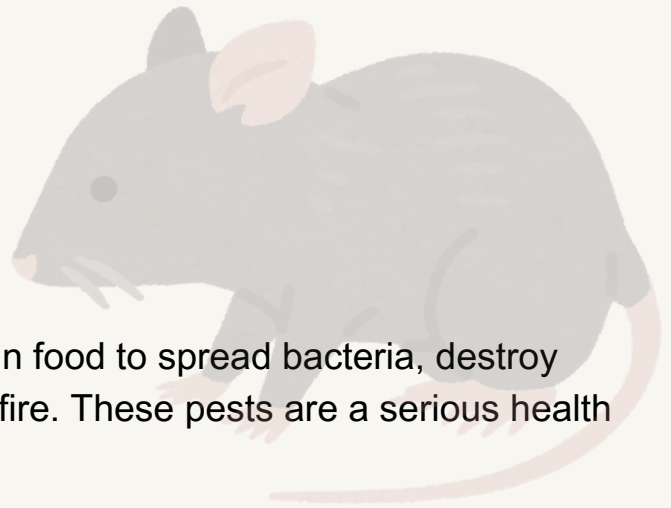
Flies are a significant issue in food premises due to their potential to spread contamination. Their bodies are covered with hair, their feet are easy to spread germs to any surface and any contaminants they have contact with will be adhered to the body.

Flies have no teeth, cannot chew on food, but they will spit out stomach acid and suck the melted food back to consume. So even if the flies were scared off, the stomach acid would be left behind and they would also have germs. Flies usually defecate while they are eating.

Here's what you need to know:

- **Reproduction:** A female housefly can lay 375 to 750 eggs, which can hatch in as little as seven days, allowing a small fly problem to escalate quickly.
- **Contamination Spread:** Flies carry filth because their bodies are hairy and their feet have suction cups, which pick up and transfer contaminants. They vomit on solid food to dissolve it and then suck it up, leaving behind vomit and germs. They often defecate while feeding.
- **Attraction and Entry:**
 - Flies can enter through tiny openings, even as small as a pinhead.
 - They are attracted to rot, garbage, human feces, and animal waste, which are their breeding and feeding grounds.
 - They prefer moist, warm, and rotting material out of sunlight for laying eggs, typically around garbage can rims and other protected, out-of-the-wind areas.

Rodents



Large and small mouse rodents can ruin food to spread bacteria, destroy buildings and even bite wires to cause fire. These pests are a serious health hazard.

As they move around, their feces will fall into the food. Being bitten by a rodent is very dangerous to humans and must be handled with care to prevent transmission of disease.

Rodents, such as rats and mice, pose serious problems in food premises:

- **Damage and Hazards:** They damage property by chewing through walls and electrical wires, potentially causing fires. They also contaminate food and surfaces with their waste.
- **Health Risks:** Rodents spread diseases through their urine and feces, which can fall, be blown, or carried into food. Their waste is a major contamination risk due to their poor bladder control.
- **Breeding and Control:** Rodents breed frequently and can be difficult to control. Rats, in particular, are wary of poorly set traps and other control measures. Dead rats must be handled carefully to prevent disease spread.
- **Behavioral Signs:** Rodents are usually active in the dark and at night. Seeing them in daylight or well-lit areas indicates a severe infestation.

COCKROACHES AND RODENTS ARE ACTIVE IN THE DARKNESS AND AT NIGHT, IF YOU SEE THEM IN THE DAYTIME OR IN WELL-LIT PLACES, IT IS A SIGN THAT THE RODENTS ARE ALREADY WELL SETTLED. CALL A LICENSED PEST CONTROL COMPANY RIGHT AWAY !!!

Pest control company

Food premises operators should use certified pest control services and focus on integrated pest management (IPM) practices to reduce reliance on chemicals and prevent contamination:

- **Sanitation and Housekeeping:** Deny pests access to food, water, and shelter through rigorous sanitation and housekeeping practices.
- **Pest-Proofing:** Implement measures to keep pests out by ensuring the building is well-sealed and free of entry points.
- **Professional Services:** Collaborate with a licensed pest control company for effective management and prevention strategies.

To effectively manage pests in food premises:

- **Emergency and Prevention:** Use pest control companies both for emergency situations and for preventative measures.
- **Licensed Professionals:** Hire a licensed pest control company suited to your premises and work closely with them to establish a comprehensive contract, inspection system, treatment procedures, and follow-up.
- **Chemical Safety:** Understand the chemicals and procedures used in specific areas to ensure safety for employees and customers.
- **Record Keeping:** Maintain receipts and records of all pest management activities for up to a year for review by public health inspectors.
- **Pest Prevention:** Ensure your premises are protected against pest entry and free of conditions that promote pest harboring or breeding.

Pest Prevention Guidelines:

DO:

- Seal gaps, cracks, and openings in floors, walls, and equipment.
- Repair leaky plumbing.
- Keep the building's exterior in good condition.
- Use screens to cover windows, doors, and vents.
- Install heavy plastic strips or air curtains on frequently used receiving doors.

DON'T:

- Don't provide a water source for pests; drain sinks and fix leaky pipes.
- Don't leave doors open when not in use. Use door sweeps to close gaps, as mice can squeeze through openings as small as a quarter inch, and rats can squeeze through half-inch gaps.

Remember

- Insecticide companies must be government-licensed
- A report must be given for every inspection by health inspectors
- Doors and windows check regularly make sure they are intact without damage
- Effective and adequate waste disposals

The design of your premises should be based on the flow of food to avoid cross-contamination

- Walls and ceilings, should be smooth, use materials that are easy to clean and stay dry.
- The floor must be easy to clean, but also have a slope for water to drain and should be coved (concave curved surface) at the wall which makes cleaning easier.
- Proper dishwashing facilities, cooler, freezer, and dry storage space.
- The lights should be sufficient, shades must use shatterproof materials.
- Ventilation system must comply with government regulations and have the appropriate filter to avoid fumes and hot air pollution to food.
- Ensure equipment is properly designed, constructed, located, operated, maintain, and clean to prevent contamination.
- Equipment should be made of corrosion resistant and non toxic materials.
- Regularly clean the range hood to avoid fire hazards.
- Establishment must have potable water that is safe to drink and use for cooking, water source must have hot and cold water and enough water pressure.
- Handwashing sinks with liquid hand soap and single-use towels in suitable dispenser in accessible locations to encourage frequent use.
- Garbage disposal - Both liquid waste water and solid garbage must comply with government specifications and keep away from food sources.
- All unauthorized members of the public “Visitors” must adhere to the policies and procedures of the food premises, avoid areas with food is prepared, processed, or stored.

In Review

The following topics have been covered in this section:

- **Facility and Design of Premise**
- **Equipment is properly designed, constructed, located, operated, maintained, and cleaned to prevent contamination**
- **Types of Pest**
- **Pest prevention and control measures**
- **Pest control company and its role**

CHAPTER EIGHT

CLEANING AND SANITIZING

Maintaining cleanliness in food premises is crucial not just for appearance, but for controlling microorganisms to keep food and customers safe. While it's nearly impossible to eliminate all microorganisms, effective cleaning and sanitizing can reduce them to safe levels. This requires both steps to be done correctly.

A well-maintained food premises relies on:

- Proper use of cleaning and sanitizing agents.
- Educating staff on correct cleaning and sanitizing procedures.
- Dedicated management and employees.
- Good organization.

Cleaning

Using detergents and hot water to remove food, dirt and soil and prepare for Sanitizing.

When cleaning, use appropriate chemicals and friction to remove dirt or soil, such as washing floors with cleaner or dishes with soap.

The cleaning process involves:

1. Removing visible food, dirt, or debris.
2. Using cleaning chemicals and friction to remove remaining residue.
3. Rinsing with hot tap water to eliminate cleaning chemicals.

For food contact surfaces like counters, dishes, cutting boards, or utensils, cleaning alone isn't sufficient. Even if a surface looks clean, it may still harbor unsafe levels of microorganisms. Therefore, after cleaning, these items must be sanitized.

Sanitizing

The use of disinfectants to reduce the number of microbes and controls the extent to which food safety is ensured.

Sanitizing reduces the number of microorganisms to safe levels. This can be done by soaking cleaned utensils in diluted bleach or using very high water temperatures in a dishwasher's sanitizing cycle.

Steps to sanitize effectively:

- Always clean items before sanitizing.
- Use very hot water (**at least 77°C or 170°F**) or chemicals to eliminate microbiological contaminants.
- Ensure items are in contact with the chemical solution or hot water for at least **45 seconds**.
- Use test reagents, strips, or a thermometer to confirm the sanitizer or solution is effective.

Always follow the manufacturer's instructions when using chemical sanitizers. It's important to mix chemicals properly. Not using enough chemicals will mean microorganisms are not being killed; using too much can lead to chemical contamination.

Chemical Sanitizers

When selecting a sanitizer, it's important to also obtain test reagents or strips to measure the solution's strength, which are available from chemical or restaurant suppliers. For hot water sanitization, use an accurate thermometer to verify the water temperature.

Types of Sanitizers:

- **Chlorine-Based Products:**

- Strength: 100 ppm (100 mg per liter)
- Common Example: Household bleach(5% strength)
- Preparation: Mix 2 ml of 5% bleach per liter of water.

- **Quaternary Ammonium-Based Products ("Quat"):**

- Strength: 200 ppm (200 mg per liter)
- Preparation: Follow the manufacturer's label for proper concentration.
- Note: May require rinsing of food contact surfaces after use.

- **Iodine-Based Products:**

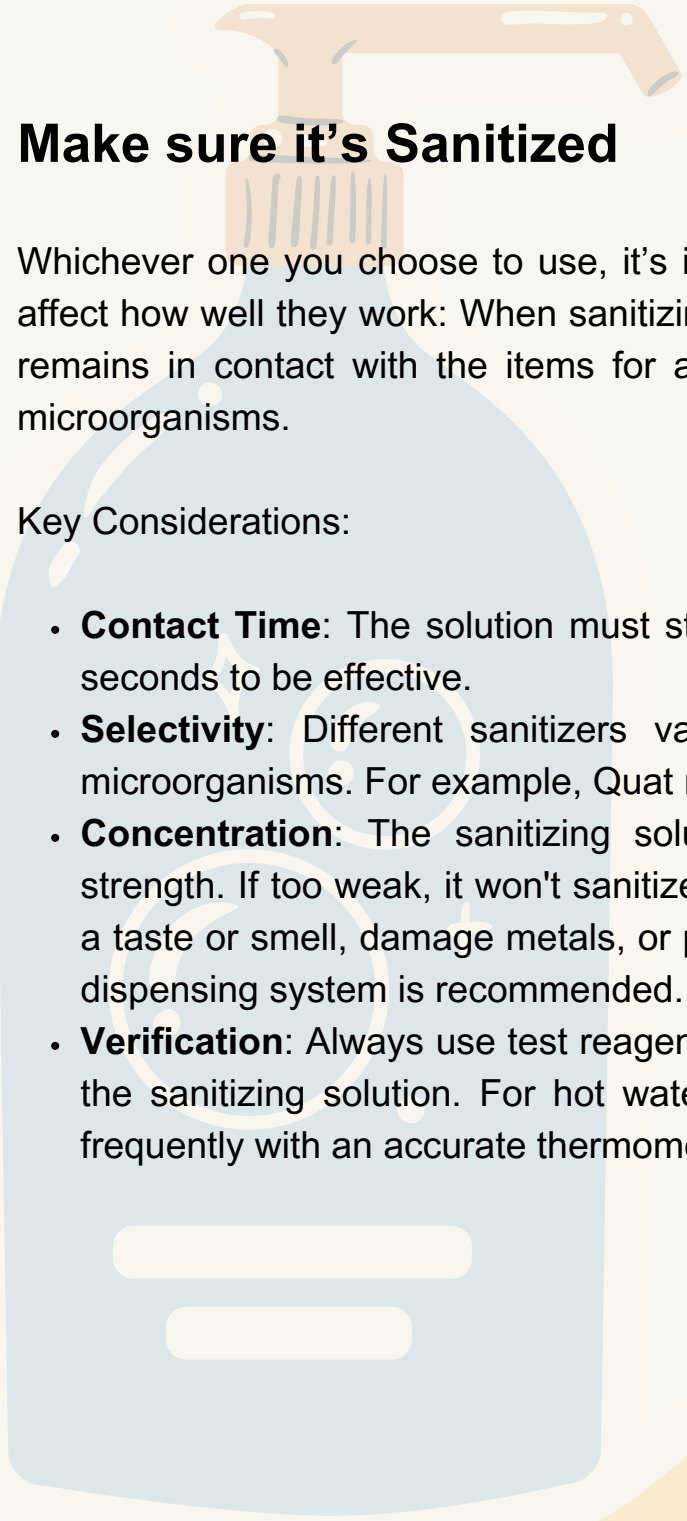
- Strength: 25 ppm (25 mg per liter)
- Preparation: Follow the manufacturer's label for proper concentration.

Other sanitizers may be used if they are:

- Approved by Health Canada, the Canadian Food Inspection Agency, or the local medical officer of health.
- Used according to the manufacturer's directions.
- Provided with a test reagent to ensure the correct concentration.

Ensure that approvals and manufacturer directions are available for inspection by public health officials.



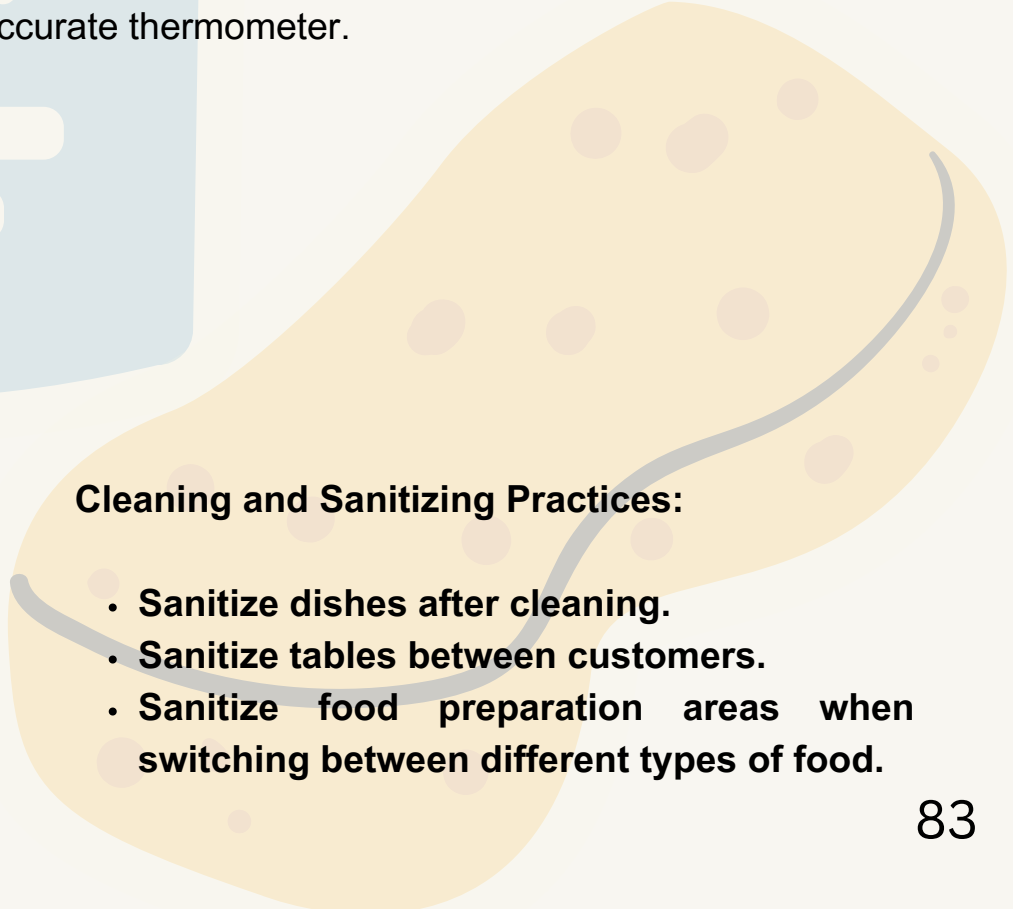


Make sure it's Sanitized

Whichever one you choose to use, it's important to remember the things that affect how well they work: When sanitizing, it's essential to ensure the solution remains in contact with the items for at least **45 seconds** to effectively kill microorganisms.

Key Considerations:

- **Contact Time:** The solution must stay on the items for a minimum of 45 seconds to be effective.
- **Selectivity:** Different sanitizers vary in effectiveness against specific microorganisms. For example, Quat may not kill all types.
- **Concentration:** The sanitizing solution must be mixed to the correct strength. If too weak, it won't sanitize effectively; if too strong, it may leave a taste or smell, damage metals, or pose a health risk. Using an automatic dispensing system is recommended.
- **Verification:** Always use test reagents or strips to measure the strength of the sanitizing solution. For hot water sanitization, verify the temperature frequently with an accurate thermometer.



Cleaning and Sanitizing Practices:

- **Sanitize dishes after cleaning.**
- **Sanitize tables between customers.**
- **Sanitize food preparation areas when switching between different types of food.**

Sterilizing

The microorganisms and spores are completely eliminated.

Sterilizing is a process that goes beyond sanitizing by completely eliminating or destroying all forms of microorganisms, including bacteria, viruses, fungi, and spores. Sterilization is often used in medical and laboratory settings, but it can also be applied in certain food preparation contexts where absolute microbial control is necessary.

Common Methods of Sterilization:

- **Heat Sterilization:**

- Autoclaving: Uses high-pressure steam at temperatures of 121°C (250°F) or higher, typically for 15-20 minutes.
- Dry Heat: Involves using hot air at temperatures of 160-170°C (320-338°F) for extended periods, often 1-2 hours.

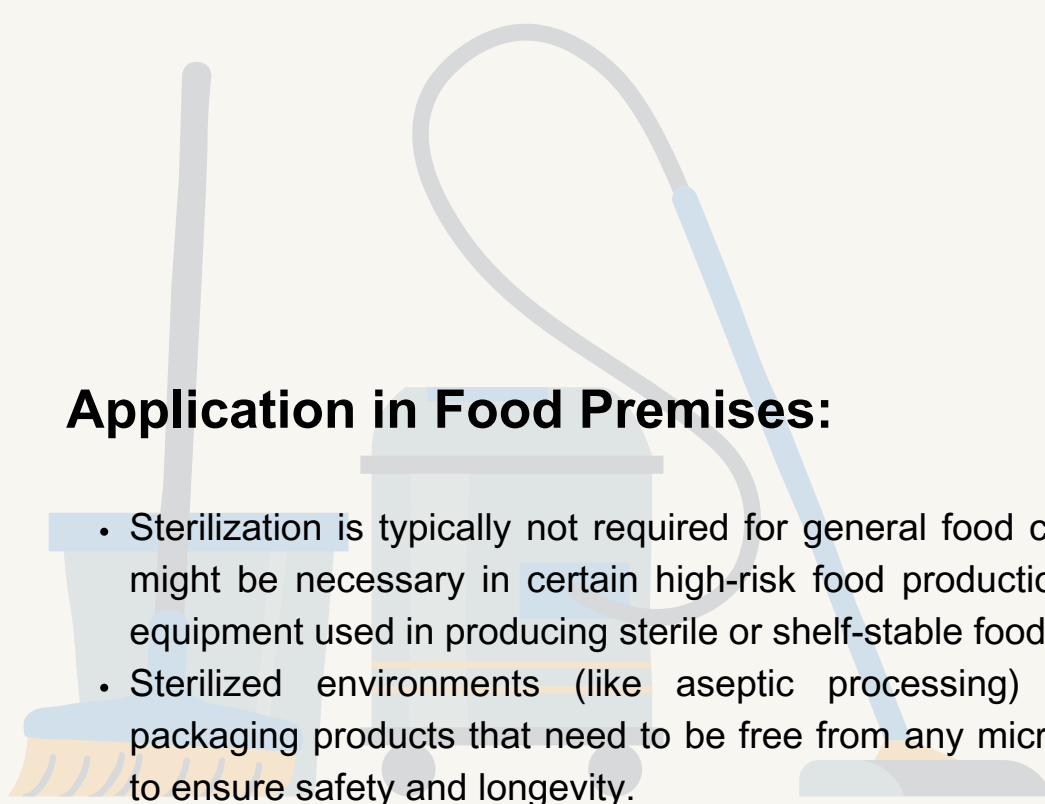
- **Chemical Sterilization:**

- Ethylene Oxide Gas: A chemical used for sterilizing medical and pharmaceutical products that cannot withstand high temperatures.
- Hydrogen Peroxide Plasma: Used in low-temperature sterilization processes, suitable for delicate instruments.

- **Radiation Sterilization:**

- Gamma Radiation: Penetrates and kills microorganisms through ionizing radiation, commonly used for disposable medical equipment and food products.

- **UV Light:** Though more for surface sterilization, it can be used to sterilize air and water.



Application in Food Premises:

- Sterilization is typically not required for general food contact surfaces but might be necessary in certain high-risk food production processes or for equipment used in producing sterile or shelf-stable food products.
- Sterilized environments (like aseptic processing) are crucial when packaging products that need to be free from any microbial contamination to ensure safety and longevity.

In contrast to sanitizing, which reduces microorganisms to safe levels, sterilizing ensures that no microorganisms survive.

General housekeeping

Washrooms, locker rooms, must be cleaned and disinfected every day.

Washrooms must have, male / female marked, hot and cold water, soap and disposable toilet paper.

Trash cans and environmental recycling buckets must comply with municipal regulations.

The kitchen hood must be cleaned regularly to avoid the accumulation of grease and fire hazards.

Dishwashing

Correctly washing our dishes is Important

- Control and minimize microbial contaminants
- Proper cleaning procedure: wash, rinse, and sanitize
- Often enough to prevent the accumulation of food residue and other debris

In food premises, three primary dishwashing methods are used depending on the type of dishes and available equipment:

- **Manual Dishwashing Using Three Sinks:**

- Step 1: Wash dishes in the first sink with hot soapy water to remove food residue.
- Step 2: Rinse in the second sink with clean hot water to remove soap.
- Step 3: Sanitize in the third sink using a sanitizing solution or very hot water.

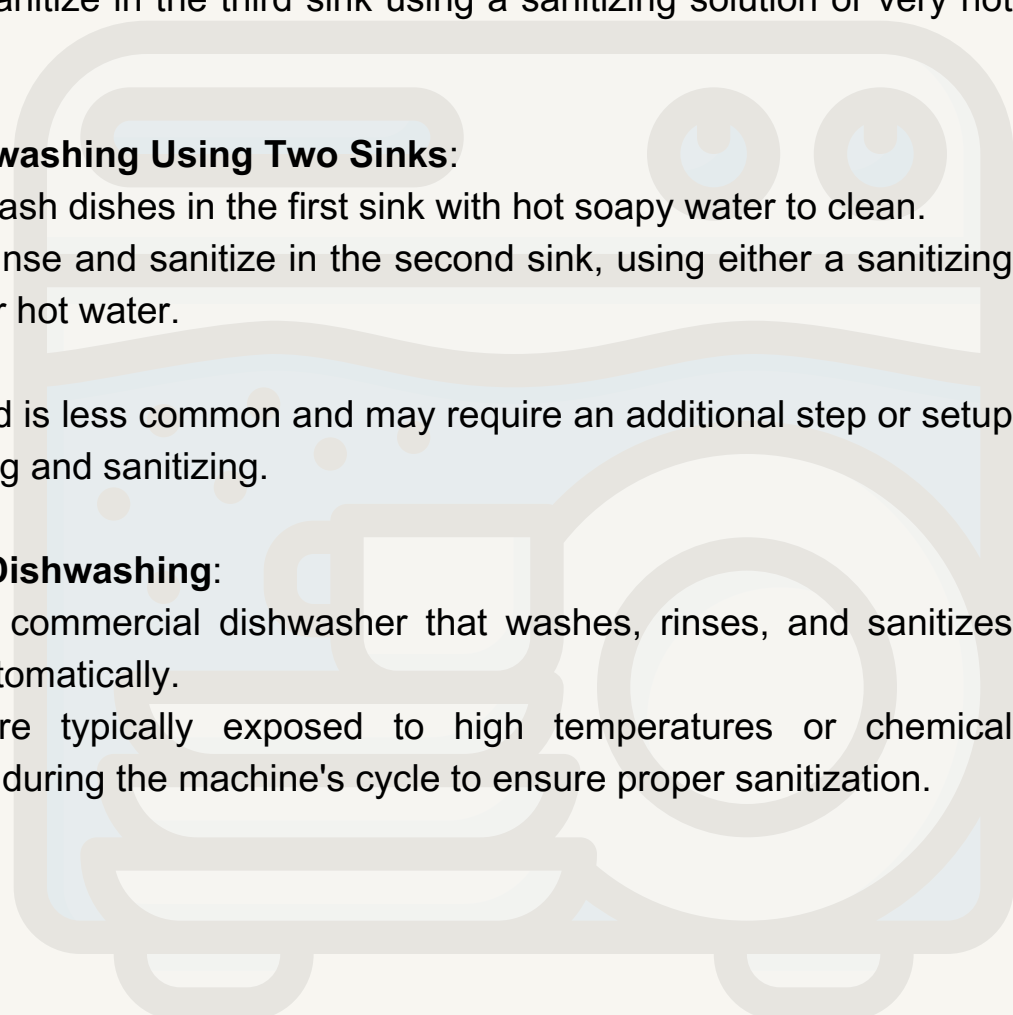
- **Manual Dishwashing Using Two Sinks:**

- Step 1: Wash dishes in the first sink with hot soapy water to clean.
- Step 2: Rinse and sanitize in the second sink, using either a sanitizing solution or hot water.

Note: This method is less common and may require an additional step or setup for effective rinsing and sanitizing.

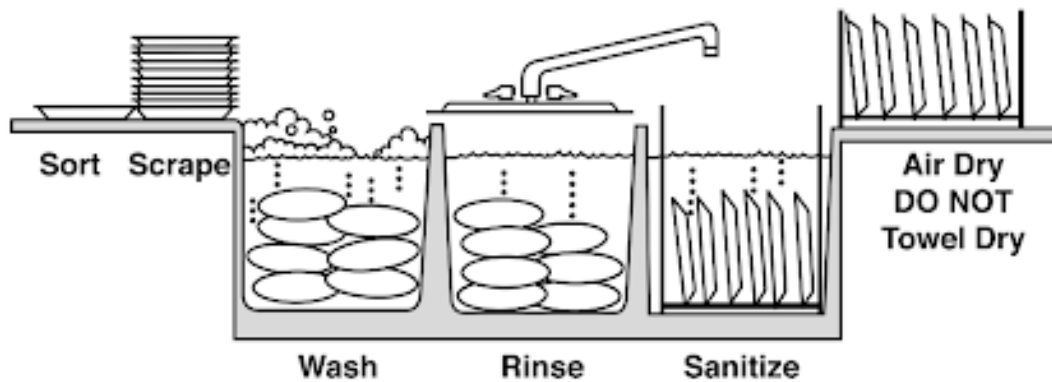
- **Mechanical Dishwashing:**

- Utilizes a commercial dishwasher that washes, rinses, and sanitizes dishes automatically.
- Dishes are typically exposed to high temperatures or chemical sanitizers during the machine's cycle to ensure proper sanitization.



Manual Dishwashing Procedure

To be posted near dishwashing area



Three Compartment Sink

Scrape / Pre-Rinse

If you have items with baked-on grease or heavy food residue, pre-soak and scrape before you wash. Remove any leftover food on the dishes by scraping or rinsing it off.

First Sink Tank Cleaning

First remove any food that is left on any dishes by scraping or rinsing. Clean and scrub dishes, kitchen utensils and pots to ensure that all food and grease are cleared. Cleaning requires the use of chemicals and scrubbing, use warm water and detergent at 45 ° C and scrub.

Second Sink Tank Rinsing

Use water with a temperature of at least 45 ° C to rinse dishes, utensils and pots to remove detergent and any remaining food residue. This step is very important and must remove any detergent that remains on the dish if the water does not look clean and must be changed.

Third Sink Tank Sanitizing

Soak the dishes, kitchen utensils and pots in sterile water at a temperature of at least 77 ° C for sterilization. Or soak in water at a temperature of at least 45 ° C with a chemical solution and let it sit for at least 2 minutes to give disinfectant enough time to reduce the number of microbes to a safe level.

To ensure that the sanitizer is effective, test its strength immediately after mixing it in the sink. This ensures that the solution is at the correct concentration for proper sanitization. You may use a test paper to test its concentration.

Air Dry

After sanitizing, put the dishes, pots or utensils on a clean corrosion-resistant inclined drainage board to air dry. Never use a towel to dry, because the workers or wet cloth are likely to cause contamination. (If you must, then make sure cloth and towel for washing, drying, polishing are in good repair clean and use for no other purpose.) Wash hands before handling clean wares.

Two Compartment Sink

First Sink Tank Cleaning + Rinsing

First remove any food that is left on any dishes by scraping or rinsing. Clean and scrub dishes, kitchen utensils and pots to ensure that all food and grease are cleared. Cleaning requires the use of chemicals and scrubbing, use warm water and detergent at 45 ° C and scrub.

Use water with a temperature of at least 45 ° C to rinse dishes, utensils and pots to remove detergent and any remaining food residue.

This step is very important and must remove any detergent that remains on the dish if the water does not look clean and must be changed.

Second Sink Tank Sanitizing

Soak the dishes, kitchen utensils and pots in sterile water at a temperature of at least 77 ° C for sterilization. Or soak in water at a temperature of at least 45 ° C with a chemical solution and let it sit for at least 2 minutes to give disinfectant enough time to reduce the number of microbes to a safe level.

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Air Dry

After sanitizing, put the dishes, pots or utensils on a clean corrosion-resistant inclined drainage board to air dry.

Never use a towel to dry, because the workers or wet cloth are likely to cause contamination. (If you must, then make sure cloth and towel for washing, drying, polishing are in good repair clean and use for no other purpose.)

Machine wash (Hot water & Chemical sanitizer)

Dishwashers in food premises must meet minimum standards outlined in the Food Premises Regulation and be regularly cleaned and maintained. There are two basic types of dishwashers:

1. Hot Water Sanitizing Dishwashers: Use high temperatures to sanitize.
2. Chemical Sanitizing Dishwashers: Use chemical solutions to sanitize.

Both types can be used, provided they are checked regularly to ensure they are sanitizing effectively. All machines must have gauges that show wash and rinse temperatures.

High Temperature Washer

High-temperature dishwashers use hot water in the rinse cycle to sanitize. The water must reach at least 82°C (180°F) and remain at that temperature for at least 10 seconds. If the machine cannot achieve this temperature, a water temperature booster should be used.

Low Temperature Washer

Low-temperature dishwashers use chemical sanitizers in the rinse cycle. To ensure proper sanitization, test strips should be available to measure the sanitizer concentration. Avoid overcrowding the dishwasher to ensure effective cleaning. Place bowls, cups, and glasses open side down, pre-soak and mix cutlery to prevent nesting.

NSF International

NSF approved dishwashers may also be used in food premises. They may have different time/temperature settings for washing and sanitizing. Operators must ensure that it is working as per manufacturer directions.

After Washing

Always wash your hands before handling clean dishes.

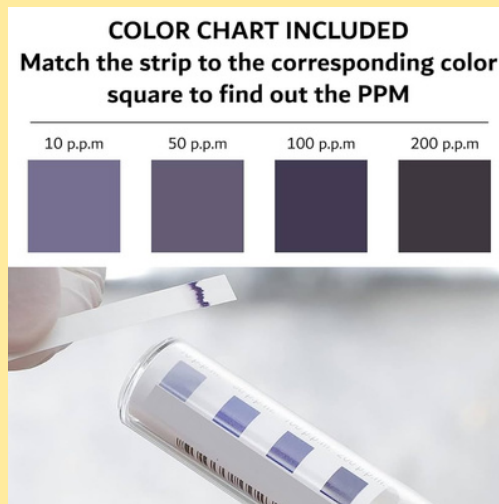
After cleaning, dishes, utensils, and pots should be stored on clean, sanitized surfaces, away from dust, garbage, or splashes, and at least 15 cm (6 inches) off the floor. Ensure they are completely dry and cool before storing; avoid towel drying to prevent contamination. Discard any damaged dishes, such as those that are cracked, chipped, or warped, as they can be physical hazards.

Large utensils/equipment

Should sanitize by spraying or rinsing with either hot water or steam that reached a minimum of 82 °C/180°F, or a chemical solution double the strength as described in general sanitizing.

To ensure that the sanitizer is effective

- Test its strength immediately after mixing
- You must use a test paper to test its concentration
- Retest every 2 hours, if concentration dropped, make necessary changes or remix immediately



Remember

- Only use Government approved chemicals
- Follow manufacturer's directions for all chemical sanitizers.
- Wash water temperature must reach between 60°C and 71°C
- Sanitizing rinse, Water (hot water dishwashers) should reach a minimum of 82°C and be applied for a minimum of 10 seconds,
- Chemical solution (chlorine, quaternary ammonium compound, iodine) not lower than 24°C for at least 45 seconds
- Proper use; do not over crowd
- Washing equipment must be clean and maintained regularly
- Regular checkup should be done, repair or replace if necessary
- When hand wash, use 45 °C or higher hot water for dishwashing and preparing chemical sanitizers
- When hand wash, dishes should soak in chemical sanitizer for at least 2 minutes Sanitize with hot water, at least 77 °C for at least 45 seconds
- Chlorine Chlorine (Spray 200 mg / L) (Soak 100 ppm)
- Iodine (Spray 25 mg / L) (Soak 25 ppm)
- Quaternary Ammonium (Spray 200 mg / L) (Soak 200 ppm)

In Review

The following topics have been covered in this section:

- Define and explained the importance of Cleaning
- Define and explained the importance of Sanitizing
- Define and explained the importance of Sterilizing
- Dishwashing Methods
- Manual Dishwashing (3 Compartment sink, 2 Compartment sink) wash, rinse, and sanitized.
- Mechanical Dishwashing (Hot water sanitizing and Chemical sanitizing)

CHAPTER NINE

PERSONAL HYGIENE

Personal hygiene of food industry workers

People are major sources of microorganisms that can cause foodborne illness. Microorganisms are present on and in the body (e.g., on hands, face, hair) and on clothing, regardless of whether a person feels ill. These microorganisms can transfer to food and make others sick, even if the person carrying them shows no symptoms.

Therefore, it is crucial for food handlers to practice good personal hygiene to prevent transferring harmful microorganisms to food, as even a small amount can be dangerous to some individuals.

In order to ensure food safety, personal hygiene is very important. Even a very clean and healthy person will always have bacteria on their hands, body and clothes.

Our skin and respiratory system is likely to bring disease-causing bacteria, all workers must maintain good personal hygiene and cleaning habits, so that harmful bacteria don't spread to food.

Good personal habits such as:

- Do not touch body, nose, hair, mouth etc.
- Do not open bags by blowing in them.
- Do not taste foods with fingers or lick fingers (use clean utensils)
- Restrain or cover hair.
- Wear clean clothing and uniforms. (change when necessary)
- Personal effects and jewelry should be remove.

Uniforms, Clothing and Aprons

The Food Premises Regulation mandates that all employees in food premises wear clean outer clothing when handling food. Light-colored clothing is recommended because it makes dirt and stains more visible. Dirty clothing may carry pathogens, so if a food handler's clothing or apron becomes dirty, it should be changed for a clean one immediately.

Hair

Human hair can cause both physical and microbial contamination in food. To prevent this, headgear like hats or hair nets should be worn to keep hair out of food and off food contact surfaces. Headgear also reduces the likelihood of touching hair and then food. Hair can carry microorganisms, some of which may be pathogens, making it essential to prevent hair from contaminating food.

Food Handler Requirements:

- **Food Handlers:** Must wear headgear to confine hair and prevent contamination.
- **Food Service Workers** (e.g., servers): Headgear is required if they also engage in food preparation tasks (e.g., preparing salads, desserts, or ladling soup).

Headgear should be worn properly, covering all hair, including the forehead and back of the neck.

Hands and Nails

Hands can easily pick up and transfer germs, so thorough handwashing is crucial for preventing the spread of foodborne illnesses and communicable diseases. Special attention should be given to cleaning under fingernails, which can harbor dirt and germs.

Avoid wearing hand jewelry. Rings, bracelets and wrist watches can trap dirt, making thorough hand washing harder.

Hand Hygiene Tips:

- **Use a Personal Nail Brush:** Clean under fingernails with a nylon brush.
- **Keep Nails Trimmed:** Well-trimmed nails are easier to keep clean.
- **Avoid Nail Polish:** It can chip and fall into food.
- **Care for Hangnails:** Protect and treat them to prevent infection.

Handwashing Guidelines:

- **Before Starting Work:** Always wash hands before beginning any tasks.
- **Before Handling Food or Cleaning:** Wash hands before handling food or cleaning dishes and utensils.
- **After Contamination:** Wash hands whenever they become dirty or contaminated with germs or different types of food.

Proper handwashing is the most effective way to prevent the spread of communicable diseases and foodborne illnesses.

Nose or Mouth Contact

Touching your nose or mouth can contaminate your hands. If you do, wash your hands immediately. To avoid transferring microorganisms to your hands, avoid:

- **Biting your nails**
- **Smoking**
- **Licking your fingers**
- **Smoothing your hair, beard, or mustache**
- **Touching your nose**

If you do any of these things, you must wash your hands properly before handling food or anything that touches food, like counters or utensils.

Coughing and Sneezing:

- Contain coughs and sneezes with tissue paper and wash your hands right afterward.
- If no tissue is available, cough or sneeze into your upper sleeve, not your hands.
- Avoid using cloth handkerchiefs, as they can reintroduce germs to your hands.

Handling Contaminated Food:

- Throw away any food contaminated by a sneeze or cough.
- Clean and sanitize any food contact surfaces affected by a sneeze or cough.

Some other common ways that your hands could get contaminated are:

- **Handling raw foods**
- **Clearing tables**
- **Handling dirty dishes**
- **Handling garbage**
- **Cleaning and mopping**
- **Handling bottoms of boxes**
- **Handling money**

Using the washroom

Proper handwashing after using the toilet or urinal is crucial, as fecal matter and urine can spread high levels of microorganisms and pathogens, even if you don't feel sick. Toilet paper does not prevent germs from transferring to your hands. Hepatitis A outbreaks have occurred due to improper hand hygiene, with the virus present in feces before symptoms appear.

Contaminated food handled by infected individuals, such as sandwiches and salads, has been linked to these outbreaks.

Handwashing to prevent Foodborne Illness (FBI)

Designated sinks. Use a sink that's only used for handwashing.

You must properly wash your hands so that surface microorganisms are removed, you need to use lots of soap and warm water.

Supplied with hot and cold running water that is safe for human consumption and available in quantities sufficient to meet the needs of the commercial food establishment.



Effective Handwashing Steps:

- Wet Hands: Rinse hands under clean, running water (warm or cold).
- Apply Soap: Use enough soap to cover all surfaces of your hands.
- Lather: Rub hands together to create a lather, making sure to scrub all areas:
 - Front and Back: Clean both the front and back of hands.
 - Between Fingers: Interlace fingers and scrub between them.
 - Under Nails: Use a brush if needed to clean under fingernails.
 - Around Wrists: Don't forget to scrub wrists.

- Scrub: Continue scrubbing for at least 20 seconds. Sing the "Happy Birthday" song twice as a timer.
- Rinse: Rinse hands thoroughly under clean, running water to remove all soap and residue.
- Dry: Dry hands with a clean paper towel or air dryer. Avoid using shared cloth towels to prevent cross-contamination.
- Turn Off Tap: Use a paper towel to turn off the faucet to avoid touching it with clean hands.

Following these steps ensures that your hands are properly cleaned and reduces the risk of spreading germs and pathogens.

Disposable Plastic gloves

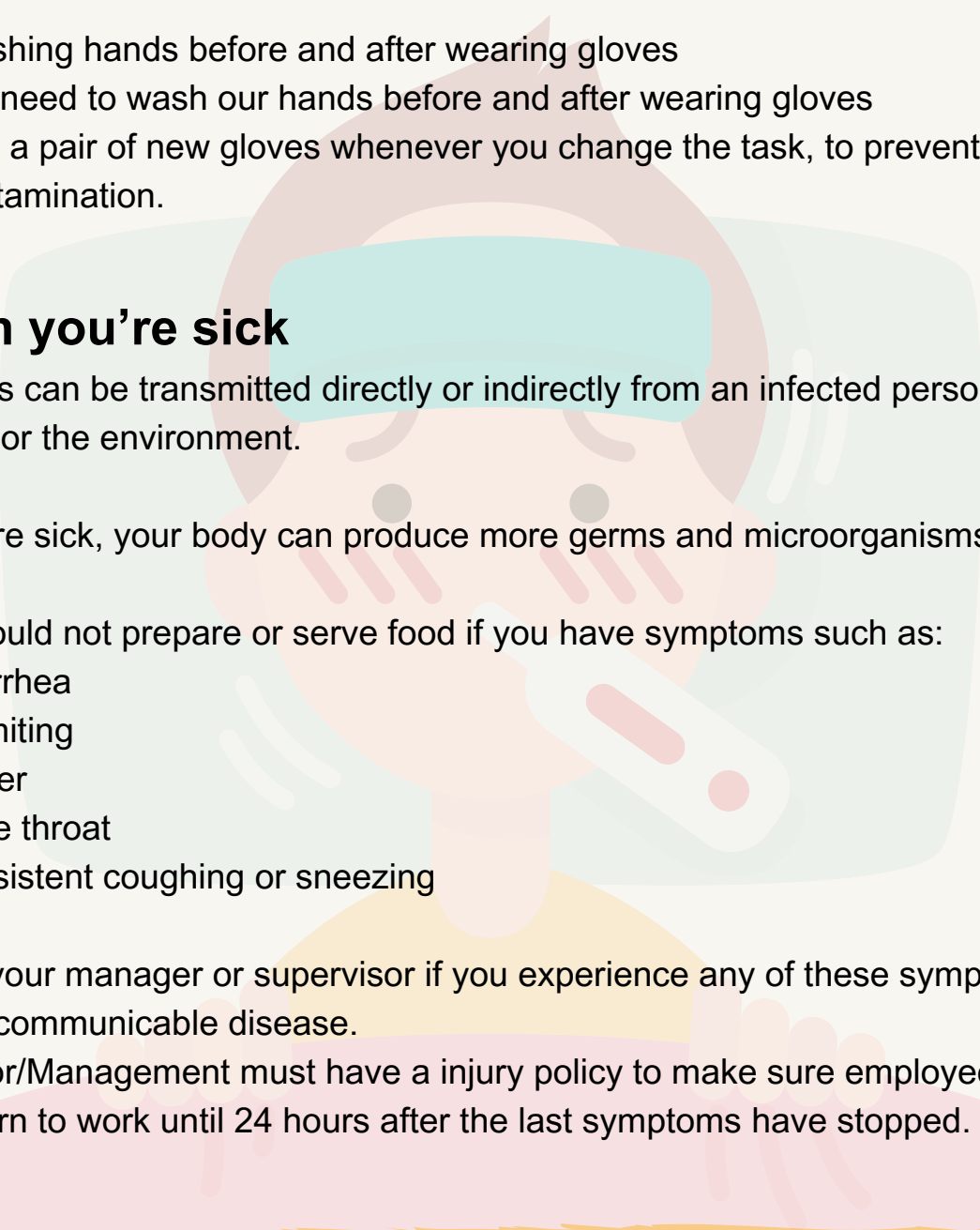
- Disposable plastic gloves can be used instead of bare hands, but they can pick up microorganisms just like hands.
- Wash your hands before and after using gloves, and always use a new pair when changing tasks or after potential contamination.
- Dispose of used gloves properly.
- Wearing disposable gloves is not a substitute for hand washing.
- Gloves should be changed as often as you would wash your hands.

Rules on the use of plastic gloves

- If the hand is wounded or infected, you must wear bandages and then gloves over your hands, until the wound or infection is cured.
- Plastic gloves can be contaminated by microorganisms.
- Gloves must be stored in a clean place and away from any sources of contamination.
- Can only be used once, absolutely not reusable
- If the gloves are damaged or leaky, they must be replaced

When you must wear Gloves

- If you have a cut or infection on your hand, cover it with a bandage and then wear a glove over the bandaged hand until it heals.
- A bandage alone is insufficient, as it can get wet and dirty, potentially carrying pathogens.
- This is the only situation where gloves are necessary unless required by your employer's policy.
- Always change gloves after each task.

- 
- Washing hands before and after wearing gloves
 - We need to wash our hands before and after wearing gloves
 - Use a pair of new gloves whenever you change the task, to prevent any contamination.

When you're sick

Illnesses can be transmitted directly or indirectly from an infected person, animal, or the environment.

If you are sick, your body can produce more germs and microorganisms.

You should not prepare or serve food if you have symptoms such as:

- Diarrhea
- Vomiting
- Fever
- Sore throat
- Persistent coughing or sneezing

Inform your manager or supervisor if you experience any of these symptoms or have a communicable disease.

Operator/Management must have a injury policy to make sure employees do not return to work until 24 hours after the last symptoms have stopped.

Returning to work

If you have diarrhea, the level of pathogens your body sheds is so high that handwashing alone may not reduce them to safe levels. Even after 24 hours without symptoms, your body can still shed pathogens, though in lower quantities. Continue practicing proper handwashing even if you feel well, as you might still be contagious. Some illnesses can lead to shedding microorganisms up to two weeks before symptoms appear.

Remember

- Personal hygiene and cleaning habits
- Restrain your hair (hair net or hat)
- Avoid activities that introduce contamination(multitasking during food preparation)
- Shower each day before going to work
- Wear clean clothing and uniforms (change into uniform at work)
- Avoid illness transmitted directly or indirectly from an infected person or animal, or the environment
- Hand sanitizers can not replace washing hands
- Must wash hands after touching face or hair, sneezing or coughing, and removing garbage
- Advise management if suffering from a communicable disease and/or common symptoms
- Operator/management must encourage employees to avoid food handling work when they're showing or feeling symptoms of illness or injured.

In Review

The following topics have been covered in this section:

- **Personal Hygiene and the impacts on food safety**
- **Importance of Handwashing**
- **Proper Handwashing procedures**
- **Employee Illness and the proper procedure for managing it**

CHAPTER TEN

FOOD SAFETY MANAGEMENT SYSTEMS

During inspections, the public health inspector may do a Hazard Analysis Critical Control Point (**HACCP**) audit. Also identifying the risks of food and setting up a safe food processing plan can benefit us in preventing foodborne illness, keeping records, and retention in the event of a foodborne illness or product recall.

Hazard Analysis Critical Control Points

HACCP stands for Hazard Analysis Critical Control Point, a self-inspection system designed to manage physical, chemical, biological, and allergen contamination throughout food processing.

Developed initially for NASA to ensure the safety of astronauts' food, HACCP proved successful and was adopted globally in food production. The primary goal of HACCP is to reduce or eliminate foodborne illness and prevent food adulteration.

For details on implementing a HACCP system, consult the Canadian Food Inspection Agency (CFIA) website.

Before implementing any food safety management system, ensure you follow these basic food safety practices:

- **Clean and Sanitary Premises:** Maintain cleanliness through regular cleaning, sanitizing, pest control, and equipment maintenance.
- **Safe Food Stores:** Ensure safety in food receiving, storage, and transportation.
- **Safe Food Handling and Packaging:** Use proper methods for handling and packaging food.
- **Good Personal Hygiene:** All staff handling food must practice good personal hygiene.

HACCP Principles

The seven principles of HACCP are:

1. Conduct a hazard analysis.
2. Determine the Critical Control Points (CCPs).
3. Establish critical limit(s).
4. Establish a system to monitor control of the CCPs.
5. Establish the corrective action to be taken when monitoring indicates that a particular CCP isn't under control.
6. Establish procedures for verification to confirm that the HACCP system is working effectively.
7. Establish documentation concerning all procedures and records appropriate to these principles and their application.

Step 1 Hazard analysis

The first step in HACCP is hazard analysis, which includes:

- Identifying Potential Hazards: Recognize any potential hazards at each stage of food processing or preparation.
- Assessing Criticality: Determine the significance of each hazard.
- Evaluating Likelihood: Assess how likely each hazard is to occur.

Hazards should be identified at every stage of food processing and preparation, including:

- **Receiving and storage**
- **Freezing**
- **Thawing**
- **Refrigeration**
- **Food Preparation**
- **Cooking**
- **Hot and cold holding**
- **Cooling**
- **Reheating**

Hazard Examples:

Different types of food safety hazards include:

- **Microorganisms:** Can grow during preparation, storage, or holding, and may survive heating.
- **Chemicals:** Can contaminate food or food contact surfaces.
- **Physical Objects:** Can accidentally enter food.

Examples of Potential Hazards:

- **Allergen Addition:** Adding a known allergen to a recipe.
- **Physical Contamination:** Moving foods from original packaging to storage containers.
- **Microbiological Contamination:** Reheating food from cold to hot temperatures.
- **Chemical Contamination:** Cleaning food contact surfaces with chemicals.

Each potential hazard should be assessed to determine its criticality based on the risk level and likelihood of causing foodborne illness.

Processing Risks:

Certain food preparation or processing methods can increase hazard risks:

- **Large Volumes of Food:** Increase time in the temperature danger zone.
- **Multiple Step Preparation:** Especially if spanning over multiple days or involving several food handlers.
- **Significant Temperature Changes:** Moving through the danger zone from hot to cold or cold to hot.

Step 2 Critical Control Point

A Critical Control Point (CCP) is a stage in food preparation or production where food safety could be compromised. After identifying and analyzing hazards, establish CCPs to manage these risks.

For each critical hazard identified, document methods to reduce, prevent, or eliminate the risk. Use a standard Hazard Analysis/Critical Control Point worksheet for record-keeping.

Follow all the standards set by the government to customize the treatment, to effectively eliminate, reduce and prevent any potential hazard

A printable worksheet can be found in the appendix.

Critical Control Point (CCP) Examples:

- **Temperature and Time Controls:**
 - Cook hazardous foods to the minimum temperature needed to kill bacteria.
 - Store foods at temperatures that prevent bacterial growth.
 - Limit the time food spends in the danger zone.
- **Allergen Controls:**
 - Clearly communicate food ingredients to customers.
 - Use safe food handling methods to prevent allergens from contaminating unintended foods.
 - Substitute known allergens with foods less likely to cause a reaction.

Step 3 Critical Limits

For each Critical Control Point (CCP), a critical limit must be established to ensure food safety. Here are some examples:

- **Raw Chicken Parts** (Salmonella): Cook to a minimum internal temperature of 74°C (165°F) to kill Salmonella bacteria.
- **Bacterial Growth** (Cooling): Cool cooked foods from 60°C (140°F) to 20°C (68°F) within two hours, and from 20°C (68°F) to 4°C (40°F) or less within the next four hours.
- **Handwashing**: Wash hands between handling raw foods and ready-to-eat foods to prevent cross-contamination.

Step 4 Monitoring Procedures

To ensure critical limits are maintained at each Critical Control Point (CCP), the system must be monitored. Monitoring procedures need to be documented. They should be measurable and recordable, and it needs to be clear who's responsible for doing them and how often. Examples of monitoring include:

- **Cooking Temperatures**: Check temperatures during cooking to ensure they meet critical limits.
- **Refrigerator and Freezer Temperatures**: Regularly monitor to ensure they stay within safe ranges.
- **Cooling Times**: Verify that food cools quickly enough to prevent bacterial growth.
- **Inspection Stamps or Labels**: Check for government inspection stamps or labels on received food.
- **Signs of Infestation or Contamination**: Inspect for any evidence of pests or contamination.
- **Shipping Temperatures**: Confirm that received food is shipped at the correct temperatures.

Step 5 Corrective Actions

Corrective Actions are steps taken when monitoring shows that critical limits at a Critical Control Point (CCP) are not being met. They involve:

- **Correcting the Problem:** Address the immediate issue to bring the process back into control.
- **Identifying Affected Products:** Determine which products may have been impacted by the issue.
- **Dealing with Affected Products:** Decide how to handle the products that have been affected (e.g., discard or reprocess).
- **Preventing Future Issues:** Implement measures to prevent recurrence of the problem.

Examples of Corrective Actions:

- **Cooking Chicken:** If chicken is not cooked to a minimum internal temperature of 74°C (165°F), continue cooking until the correct temperature is reached.
- **Cooling Foods:** If food is not cooled to 20°C (68°F) within two hours, discard the food.
- **Handwashing:** Discard any food handled with contaminated hands.
- **Holding Baked Chicken:** If baked chicken is held at below 60°C (140°F) for less than two hours, reheat to 74°C (165°F) for at least 15 seconds. If held for over two hours, discard the chicken.

Records should document what actions were taken, when, and why, ensuring compliance with food safety standards.

Step 6 Verification Procedures

Verification is a process used to ensure that the HACCP system is functioning correctly. It is performed in addition to regular monitoring and is typically done less frequently.

Verification procedures should be documented and include:

- **Who Will Perform Verification:** Identify the person responsible for conducting the verification.
- **How to Conduct Verification:** Detail the methods and procedures to be used.
- **When to Perform Verification:** Specify the frequency or schedule for verification activities.
- **What Needs to Be Verified:** Outline the specific aspects of the HACCP system that will be checked to ensure they are working as intended.

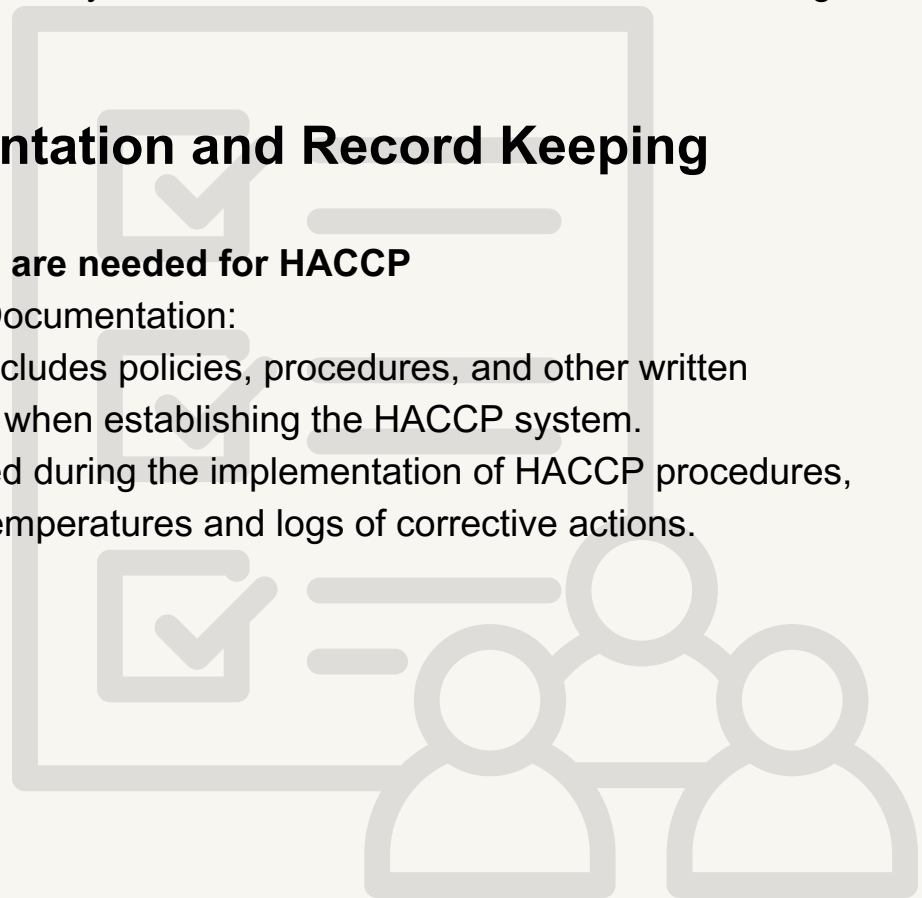
Verification is usually done by someone who isn't involved with monitoring.

Step 7 Documentation and Record Keeping

Two types of Records are needed for HACCP

HACCP Records and Documentation:

- **Documentation:** Includes policies, procedures, and other written documents created when establishing the HACCP system.
- **Records:** Generated during the implementation of HACCP procedures, such as recorded temperatures and logs of corrective actions.



Best Practices for Records Management:

- **Keep Blank Forms Accessible:** Have forms and a clipboard ready near work areas for simultaneous checks.
- **Use Notebooks:** Provide extra pages or notebooks for noting actions taken.
- **Post Documentation:** Place documentation where it is easily accessible for employees.
- **Attach Logs to Equipment:** For convenience, attach logs to the equipment they pertain to, like posting temperature logs on a refrigerator.

Employees are more likely to use records correctly if they are easy to use. Hard to use or inconvenient record keeping areas can tempt staff to put in numbers without actually measuring.

For detailed guidance on implementing HACCP and managing records, refer to the HACCP section on the Canadian Food Inspection Agency (CFIA) website.

In Review

The following topics have been covered in this section:

- Define and understand Hazard Analysis Critical Control Point (HACCP)
- The seven principles of HACCP
- Identify and set limits for Critical Control Point (CCP)
- How to Monitor and Verify your HACCP systems
- Documentations and Records that you must create and keep in the event of Foodborne Illness or Recall

Appendix : Additional Resources and Contacts

In Ontario, we have the “Health Protection and Promotion Act (HPPA), R.S.O. 1990, c. H.7” which include regulation O. Reg. 493/17: FOOD PREMISES
<https://www.ontario.ca/laws/regulation/170493>

The Health Protection and Promotion Act (HPPA), sets out the mandate to make regulations, programs and protocols which govern food premises. All local public health units are responsible for the conditions and safety under which food is held, prepared and served to the public. This is also the responsibility of the food premises owner/operator and employees.

The HPPA lays out the powers of the medical officer of health and the public health inspector.

The requirements for food premises inspection frequencies and risk assessments are outlined in the **Ontario Food Safety Protocol**, developed by the Ontario Ministry of Health and Long-Term Care. HPPA act 493/17 – according to the Food Premises regulations this information can be found online at: <https://www.ontario.ca/laws/regulations/170493>

During Public Health Inspections, PHI will conduct a risk assessment which will determine the food premises inspection frequencies outlined in the Ontario Food Safety Protocol. These requirements are outlined in the table below.

City of Toronto Board of Health

Established under the Ontario Health Protection and Promotion Act, the Board of Health determines and sets public health policy and advises City Council on a broad range of health issues and services that include health assessment, health protection, disease prevention and health promotion. Board of Health for the City of Toronto Health Unit By-law 2-2019, as amended by Board of Health for the City of Toronto Health Unit By-Law 1-2020 governs the proceedings of the Board of Health and its committees.

Board Responsibilities

- Ensures public health programs and services in Toronto are delivered according to provincial standards and in response to local needs
- Works with Toronto Public Health staff to develop strategic plans, goals and policies for Toronto Public Health
- Advises City Council on a broad range of health issues
- Recommends the annual capital and operating budgets to City Council



Food Safety Protocol, 2019 PDF Guideline

<https://files.ontario.ca/moh-food-safety-protocol-en-2019.pdf>

Ontario. Ministry of Health and Long-Term Care. Ontario public health standards: requirements for programs, services, and accountability, 2018. Toronto, ON: Queen's Printer for Ontario; 2018. Available from:

http://www.health.gov.on.ca/en/pro/programs/publichealth/oph_standards/default.aspx

Health Protection and Promotion Act, RSO 1990, c H.7. Available from:

<https://www.ontario.ca/laws/statute/90h07>

Food Premises, RRO 1990, Reg 493/17. Available from:

<https://www.ontario.ca/laws/regulation/170493>

Recreational Camps, RRO 1990, Reg 503/17. Available from:

<https://www.ontario.ca/laws/regulation/r17503>

Camps in Unorganized Territory, RRO 1990, Reg 502/17. Available from:

<https://www.ontario.ca/laws/regulation/r17502>

Ontario. Ministry of Health and Long-Term Care. Operational approaches to food safety guideline, 2018. Toronto, ON: Queen's Printer for Ontario; 2018. Available from:

http://www.health.gov.on.ca/en/pro/programs/publichealth/oph_standards/protocolsguidelines.aspx

Canadian Food Inspection Agency. Hazard analysis critical control point (HACCP) [Internet]. Ottawa, ON: Canadian Food Inspection Agency; 2012 [cited 2013 Jul 05]. Available from:

<http://www.inspection.gc.ca/about-the-cfia/newsroom/food-safety-system/haccp/eng/1346306502207/1346306685922>



Ontario Food Safety Resources:

Ontario Food Premises Regulation (O. Reg. 493/17): Provides detailed regulations regarding food safety standards for food premises.

Public Health Ontario - Food Safety: Offers guidelines, resources, and updates on food safety practices. Visit Public Health Ontario

Contact Information:

Ontario Ministry of Health - Environmental Health Division:

Phone: 1-877-676-6545

Email: health@ontario.ca

Website: Ontario Ministry of Health

Local Public Health Units: Each region in Ontario has its own public health unit responsible for food safety inspections and guidance. Find Your Local Health Unit

Food Safety Contact for Emergencies: In case of food safety emergencies or outbreaks, contact the Ontario Ministry of Health and Local Health Units

Key Food Safety Practices:

Hygiene and Sanitation:

Guidelines for personal hygiene, hand washing, and equipment sanitation.

Temperature Control:

Information on safe cooking temperatures, refrigeration, and food storage.

Pest Control: Practices for preventing and managing pests in food premises.

Allergen Management: Procedures for identifying and managing food allergens.

Food Fraud Awareness:

Preventing Food Fraud: Strategies to identify and prevent food fraud, including verifying supplier credentials and monitoring food labeling.

Reporting Suspected Fraud: Report all suspected food fraud to local health authorities.

Food Safety Incident Reporting:

How to Report: Steps for reporting food safety incidents, including contact details for local public health units and emergency response teams.

Food Safety Regulations and Standards:

Canada's Food Guide: Updated guidelines for healthy eating and food safety. Read Canada's Food Guide

Canadian Food Inspection Agency (CFIA): Regulations and standards for food safety, including inspection and compliance. Visit CFIA

Alberta Food Safety Resources:

Alberta Food Safety Law are set by:

Alberta Food Regulation Act - Provides detailed regulations regarding food safety standards for food premises. https://open.alberta.ca/publications/2006_031#summary

Permits and Operations of Food Premises:

Section 3 Part 1 - Requirement of Food Permit

Permit requirements:

Operator / Owner must hold a valid and subsisting permit for the operation of the food establishment as approved by the regional health authority that issued the permit. Section 3

Change of Operator / Ownership:

An new application or any change in the information provided in the application for the permit must be made in writing to the regional health authority in whose health region the applicant proposes to handle food. Section 4 to 6

Alberta Health Services

<https://www.albertahealthservices.ca/>

Food fraud

Food Fraud is a significant concern, and it can be categorized into two major types:

Sell Potentially Harmful Food:

- Expired Food: This involves selling food items past their expiration dates, which can pose health risks due to deterioration.
- Deteriorated Food: This includes food that has gone bad due to poor storage conditions, leading to potential contamination.
- Food of Unknown Origin: Selling food without clear information about its source can be problematic, as it might be unsafe or improperly handled.

Deliberately Misleading Food:

- False Nutritional Value: This involves misrepresenting the nutritional content of food products, such as overstating health benefits or underreporting calorie content.
- Misleading Efficacy: Claims about the effectiveness of a food product in preventing or curing diseases, without scientific backing, can deceive consumers into buying products based on false assurances.

Addressing food fraud requires rigorous food safety practices, transparent labeling, and regular inspections to protect consumers and maintain trust in food products.

Overall estimates of Canadians affected by food-borne illness

The most recent average yearly estimates for food-borne illness due to known and unknown causes are:

- 30 food-borne bacteria, parasites and viruses:
 - 1.6 million illnesses (40% of food-borne illnesses)
 - 4,000 hospitalizations (34% of food-borne hospitalizations)
 - 105 deaths (44% of food-borne deaths)
- unknown causes:
 - 2.4 million illnesses (60%)
 - 7,600 hospitalizations (66%)
 - 133 deaths (56%)

This means that every year, a total of about 4 million (1 in 8) Canadians are affected by a food-borne illness. Of these, there are about:

- 11,600 hospitalizations
- 238 deaths

References

Find out more at

<https://www.canada.ca/en/public-health/services/food-borne-illness-canada/yearly-food-borne-illness-estimates-canada.html>

Federal/Provincial/Territorial Food Safety Committee. (2016). Food Retail and Food Services Code. Public Health Agency of Canada (2016).

Food-related illnesses, hospitalizations and deaths in Canada. Retrieved from

<https://www.canada.ca/en/public-health/services/publications/food-nutrition/infographic-food-related-illnesses-hospitalizations-deaths-in-canada.html>

Public Health Ontario (2015, March). Foodborne Illness What We Don't Know Can Harm Us. Retrieved from <https://www.publichealthontario.ca/en/Health-Topics/Environmental-Occupational-Health/Food-Safety>

GLOSSARY

- **Allergen:** A substance that can trigger an allergic reaction, such as peanuts, shellfish, or dairy products.
- **Bacteria:** Microscopic organisms that can cause foodborne illnesses if food is not handled, cooked, or stored properly.
- **CCP (Critical Control Point):** A step in the food production process where control is necessary to prevent, eliminate, or reduce a food safety hazard to an acceptable level.
- **Cross-Contamination:** The transfer of harmful microorganisms or allergens from one food item or surface to another, typically through improper handling.
- **Danger Zone:** The temperature range between 4°C (40°F) and 60°C (140°F) where bacteria multiply rapidly. Food should be kept out of this range to prevent bacterial growth.
- **FIFO (First In, First Out):** A stock rotation method where the oldest inventory (first in) is used before newer inventory (first out) to ensure freshness and reduce waste.
- **Food Handler:** An individual who manages food during its preparation, cooking, serving, or storage and must adhere to food safety practices.
- **Food Safety Plan:** A documented plan outlining procedures and practices to ensure food safety, including hazard analysis and critical control points.
- **Hazard Analysis:** The process of identifying potential hazards (biological, chemical, or physical) that could occur in food handling and assessing their risks.
- **Hygienic Practices:** Procedures to maintain cleanliness and prevent contamination, such as hand washing, wearing appropriate clothing, and sanitizing equipment.
- **Integrated Pest Management (IPM):** A comprehensive approach to pest control that involves prevention, monitoring, and control measures with minimal use of chemicals.
- **Labeling:** Providing information on food packages, including ingredients, nutritional value, allergens, and expiration dates, to inform consumers.
- **Misleading Labeling:** Providing false or deceptive information about a food product's ingredients, nutritional value, or health benefits.
- **Pest Control:** Strategies to prevent, manage, or eliminate pests in food establishments, including both chemical and non-chemical methods.
- **Personal Protective Equipment (PPE):** Gear worn by food handlers, such as gloves and aprons, to prevent contamination of food and protect workers.
- **Sanitizing:** Reducing the number of microorganisms on surfaces to a safe level using heat or chemicals.
- **Shelf Life:** The duration a food product remains safe to consume and retains its quality under specified storage conditions.
- **Temperature Control:** Managing food temperatures during storage, preparation, and serving to prevent bacterial growth.
- **Traceability:** Tracking the origin and movement of food products through the supply chain to ensure safety and quality.
- **Validated Process:** A procedure that has been scientifically tested and confirmed to be effective in controlling specific food safety hazards.
- **Verification:** Checking that food safety practices and procedures are being followed correctly and are effective in controlling hazards.
- **Waste Management:** Proper disposal of food and non-food waste to prevent contamination and environmental harm.
- **Zone of Danger:** Another term for the Danger Zone (4°C to 60°C) where pathogens can grow quickly.
- **Zoning:** Dividing food preparation areas into separate zones to prevent cross-contamination and maintain food safety.
- **Foodborne Illness:** Illness caused by consuming contaminated food or beverages.
- **Contamination:** The presence of harmful substances or microorganisms in food that can cause illness or injury.
- **Food Safety Culture:** The shared values, beliefs, and behaviors related to food safety within an organization.
- **HACCP (Hazard Analysis Critical Control Point):** A systematic approach to food safety that identifies and controls hazards at critical points in the food production process.
- **Microorganism:** Tiny organisms, such as bacteria, viruses, and fungi, that can cause foodborne illness if present in food.

- **Food Recall:** The process of removing unsafe or contaminated food products from the market to protect consumers.
- **Sanitary:** Clean and free from harmful microorganisms or contaminants.
- **Food Contact Surface:** Any surface that comes into direct contact with food, such as cutting boards, utensils, and countertops.
- **Cooling Curve:** The pattern of temperature changes as food cools down from cooking temperatures to safe storage temperatures.
- **Refrigeration:** The process of cooling food to temperatures below 4°C (40°F) to slow down bacterial growth.
- **Freezing:** The process of lowering food temperatures to below -18°C (0°F) to preserve it and inhibit bacterial growth.
- **Food Safety Management System:** An organized approach to managing food safety practices and procedures within an organization.
- **Foodborne Pathogen:** A microorganism that can cause illness when ingested, such as Salmonella or E. coli.
- **Chemical Contaminant:** Harmful substances, such as pesticides or cleaning agents, that can contaminate food.
- **Physical Contaminant:** Foreign objects, such as metal shards or glass, that can accidentally enter food.
- **Allergen Control:** Measures taken to prevent cross-contact and ensure accurate labeling of food allergens.
- **Cross-Contact:** The transfer of allergens from one food product to another, potentially causing allergic reactions.
- **Shelf Life Testing:** Evaluating the length of time a food product remains safe and retains its quality under specified storage conditions.
- **Food Safety Audit:** A systematic examination of food safety practices and procedures to ensure compliance with regulations and standards.
- **Cleaning:** The process of removing visible dirt and debris from surfaces to prepare them for sanitizing.
- **Cleaning Schedule:** A documented plan outlining when and how cleaning tasks should be performed to maintain hygiene.
- **Sanitizer:** A chemical or method used to reduce the number of microorganisms on surfaces to a safe level.
- **Food Safety Training:** Educational programs and materials designed to inform food handlers and managers about food safety practices and regulations.
- **Food Safety Regulations:** Laws and guidelines established by government agencies to ensure the safety and quality of food products.
- **Food Safety Inspection:** An assessment of food handling practices and conditions to ensure compliance with food safety regulations.
- **Emergency Food Safety Procedures:** Protocols to follow in case of a food safety incident, such as contamination or a foodborne outbreak.



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