

FOOD HANDLERS

— MANUAL • STUDENT —



Food and Agriculture Organization
of the United Nations



Pan American
Health
Organization



World Health
Organization
REGIONAL OFFICE THE
Americas

FOOD HANDLERS

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TABLE OF CONTENTS

INTRODUCTION	4
MODULE 1	7
Food hazards	
MODULE 2	17
Food-borne diseases	
MODULE 3	23
Hygiene measures to prevent food contamination	
APPENDIX	41
APPENDIX 1	43
Five keys to food safety	
APPENDIX 2	48
<i>Eat Safely Campaign</i>	
REFERENCES	49
FINAL EVALUATION	53



Introduction

Food-borne diseases (FBDs) are one of the most frequent public health problems in daily life.

The hazards that cause FBD may occur in the different stages of the food chain (from primary production to the table). Independently from its origin, once the food reaches the consumer it may have an impact on public health and cause severe economic damage to the establishments devoted to its preparation and sale. These two events may cause loss of confidence and the closing down of a business.

Fortunately, the measures for preventing food contamination are very simple and may be applied by anyone who handles food, by following easy rules for hygienic food handling.

The purpose of this Manual is to provide to people who handle food the information they need to facilitate and apply good food handling practices. In addition, it seeks to provide basic information about food safety that Latin American and Caribbean countries may adapt to their own needs.

The Manual is organized into three Modules and Appendices focusing on the following topics: (1) food hazards; (2) FBDs; and (3) hygienic measures to prevent food contamination.

The evaluation at the end, is part of the Manual. Its purpose is to assess the knowledge acquired during the course regarding the importance of hygienic food handling for public health.

Who is a food handler?

A food handler is anyone who handles packaged or unpackaged food directly as well as the equipment and utensils used to prepare or serve food and/or surfaces that come into contact with food. Food handlers are expected to meet food hygiene requirements (1).

Food handling is something that we all do daily, regardless of our occupation, whether we are cooking professionals, homemakers, or workers in a food plant. Therefore, there are many people who, through their effort and work, ensure that the food we consume on a daily basis is of sufficient hygienic quality that we can avoid the hazard of FBDs.

All of us have heard of diseases such as diarrhea and other kinds of gastrointestinal illnesses caused by the lack of food hygiene.

FBDs affect mainly the most susceptible segments of our society, namely, children, the elderly, pregnant women, and persons who are ill. About two-thirds of FBD epidemics have their origin in food consumption in restaurants, cafeterias, school dining rooms, and even at home.

If we always handle food with clean hands and follow the proper hygienic procedures, we can prevent our families, or our clients, from the risk of consuming contaminated food.

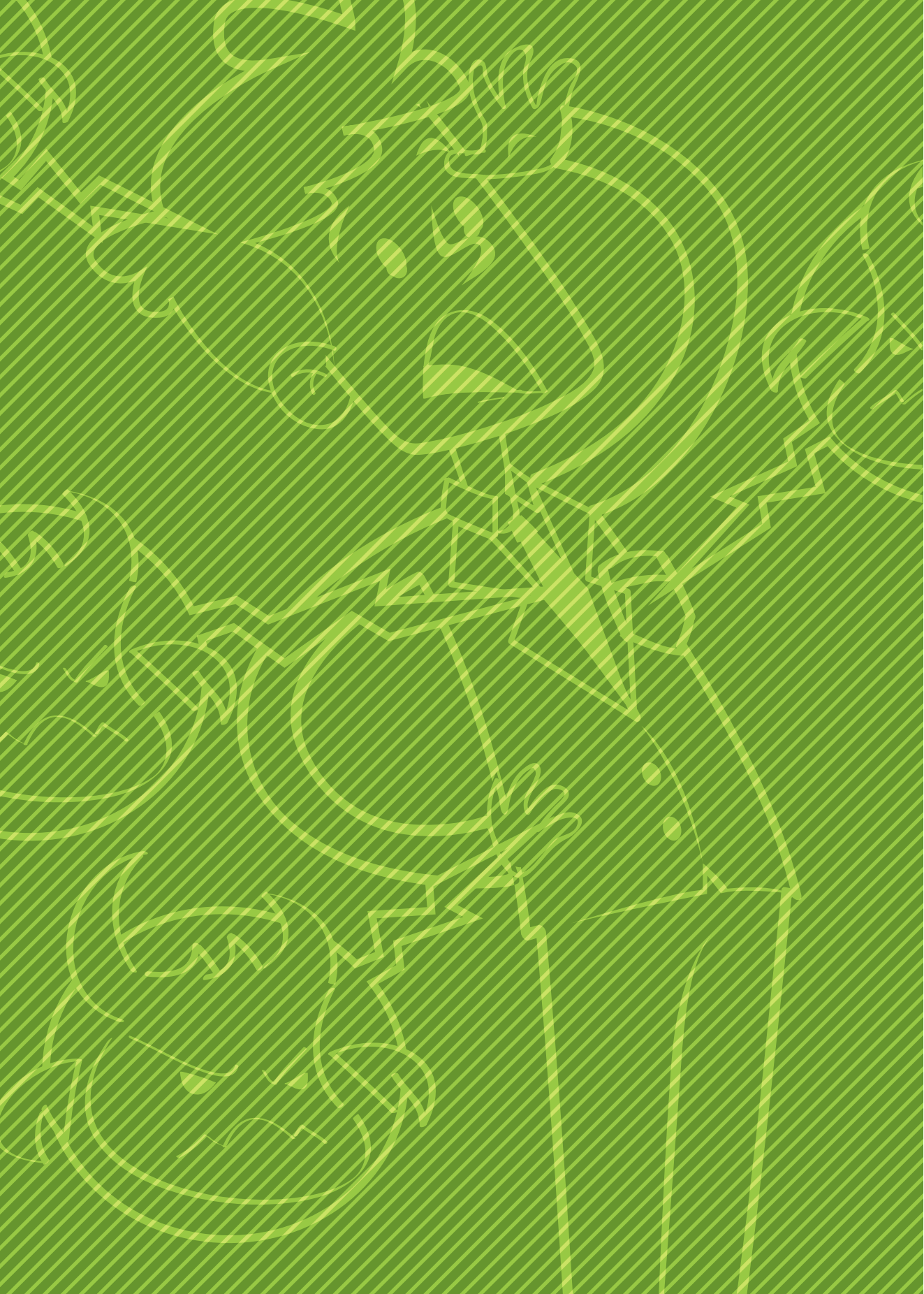
Our contribution as food handlers is critical in a food establishment and our work is of the utmost importance to our own health and the health of our family, our community, and the businesses where we prepare food.



MODULE

1

FOOD HAZARDS



Food hazards

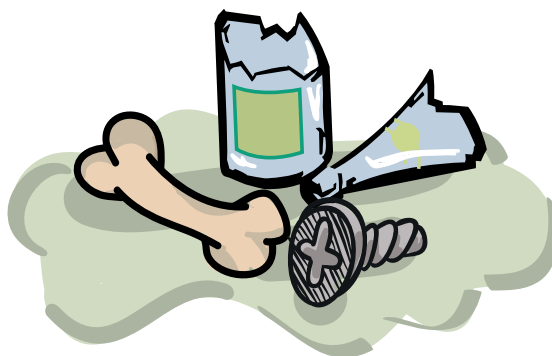
A food hazard is a biological, chemical, or physical agent in food, or a food condition that poses a threat to public health. Hazards may be introduced “accidentally, intentionally or criminally”

1. Physical hazards:

Associated with the presence of foreign matter in food.

Examples of physical hazards (2):

- Foreign matter, such as glass or wood fragments;
- Non-edible food parts, such as bone pieces or fruit stones.



2. Chemical hazards:

These hazards may occur along the entire food chain.

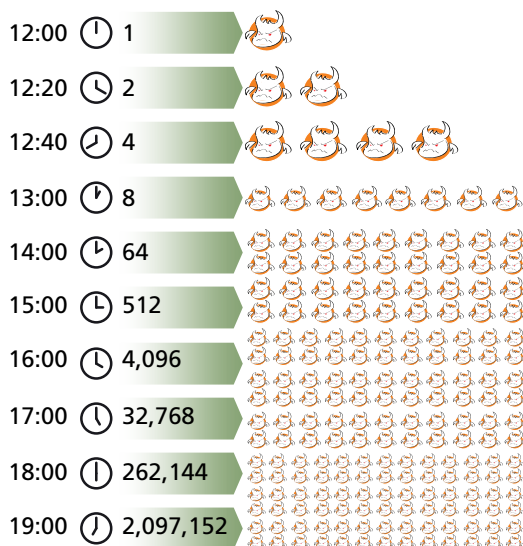
Example: Through the indiscriminate or inappropriate use of chemical products, storage mistakes, poor technique in disinfecting countertops, utensils, etc.

3. Biological hazards:

The main hazards are microorganisms (bacteria, yeasts, mold, viruses, and parasites). Bacteria are the microorganisms with a greater impact on food safety, be-



On average, under ideal conditions, bacteria may double in number every 20 minutes.



Where are microorganisms found?

Everywhere:

In the environment:

- In the air, soil, and water.
- On contaminated utensils.
- On contaminated food.
- In sewage.
- Garbage and food residues.

In human beings and animals:

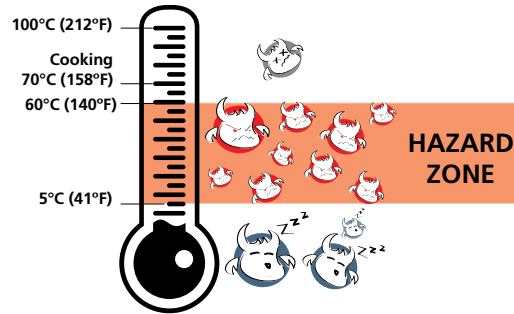
- On human and animal skin.
- On infected wounds.
- On hair.
- On hands and nails.
- In human and animal saliva.
- In feces.



Favorable and unfavorable factors for microorganism reproduction

Factors that favor reproduction:

- Nutrients
- Water
- Temperature
- Oxygen
- Time



Factors unfavorable to reproduction:

- Acidity
- Sugar
- Salt

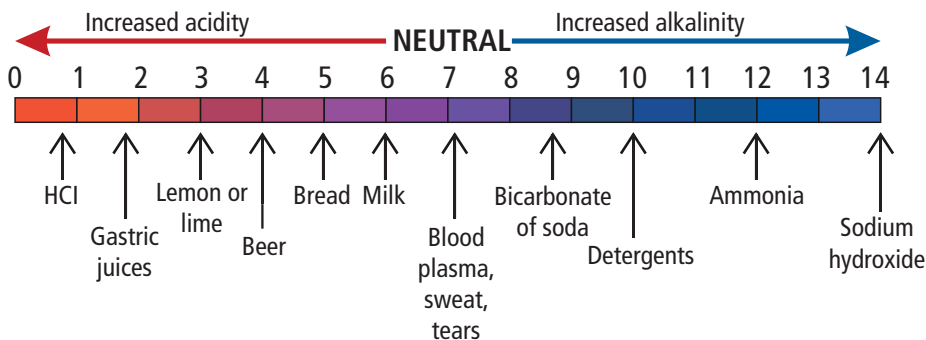


Table of foods with high potential hazard for microorganism contamination

HIGH POTENTIAL HAZARD
Cooked foods consumed cold or reheated.
Raw meat, fish, and shellfish.
Ground meat or stews.
Unpasteurized milk and dairy products.
Flans and desserts made with milk and eggs.
Whipped cream, custard sauce, and other sauces or creams.
Eggs and egg foods.
Cooked cereals and legumes, such as rice, lentils, and beans.
Cut melons and other weakly acidic fruit at room temperature.
Salad dressings with eggs.
Meat broth seasonings.
Soups and broths kept at high temperatures.
Broiled meat consumed promptly.
Fried foods consumed promptly.
Dried, salty foods, with natural or added acid, or preserved in sugar.
Walnuts, almonds, hazelnuts, if properly stored.
Breads, sweet cookies, or salads.
Butter, margarine, or edible oils.
Dry cereals.
Canned food until the can is open.
Cooked pasta.
Foods kept at a hazard temperature.

It is important to handle hazardous foods with care. Remember that these foods should not be kept in the hazard zone for more than two hours.

Types of food contamination: Primary, Direct, and Cross-contamination

1. Primary contamination:

Occurs in primary food production.

Example: Harvest, slaughter, milking, fishing.

A typical example is the contamination of eggs by the hen's feces.



2. Direct contamination:

The contaminants affect the food through the person that handles it. This type of contamination is probably the most simple and common form of food contamination.

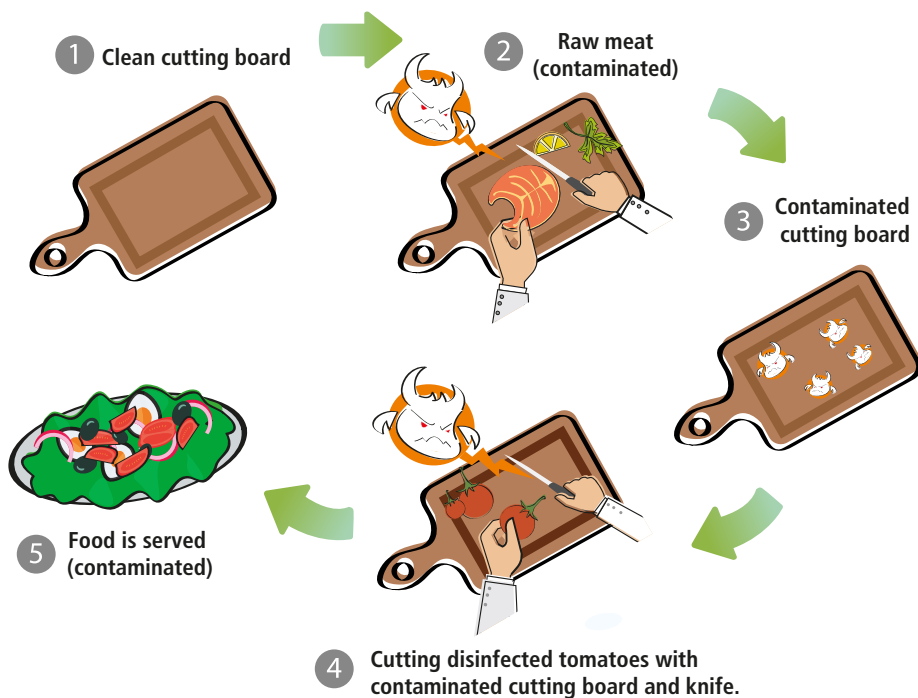
A typical example is when a person sneezes over the food.

3. Cross-contamination:

The contamination is caused by the transference of a hazard present in a food to another food that is safe, via surfaces or utensils that have contact with both, without the requisite cleaning and disinfection.

The most frequent cases of cross-contamination occur when the handler allows a raw food to have contact with a food ready to be consumed, by using the same cutting boards or kitchen utensils.

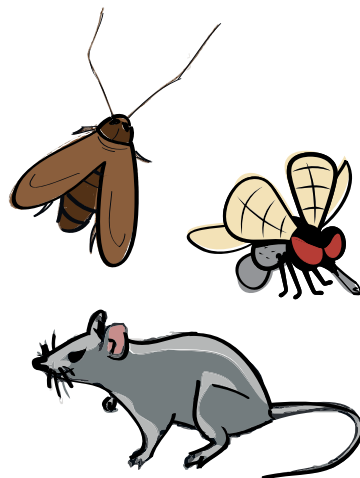
Another example of this type of contamination: when we grill meat and use the same cutting board with raw food to cut the cooked meat.



Modes of food contamination

1. Vectors:

The main vectors implicated in food contamination are birds, flies, cockroaches, rats or mice, and ants. They carry microorganisms, which they deposit on food. It is thus crucial to have a pest control program where food is handled.



2. Garbage:

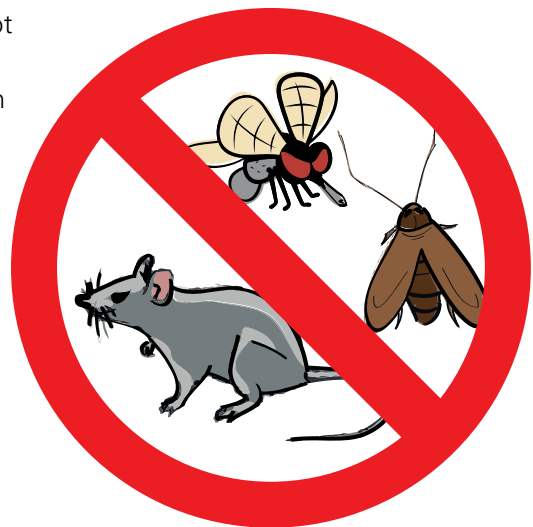
The improper storage and disposal of garbage provides an ideal medium for the development of microorganisms and pests.



Pest control program

To prevent the proliferation of pests, the following steps should be taken:

1. Ensure that the facilities and equipment (building, furniture, windows) are properly maintained.
2. External environment should be well maintained.
3. Clean and disinfect the workplace frequently.
4. Proper storage of food.
5. Proper disposal of leftover food at the workplace.
6. Prevent pests in the workplace by not leaving doors and windows open, installing mosquito screens and drain grates among other measures.
7. Prevent animals from feeding on garbage and food residues.
8. Prevent pests from nesting in the workplace. This requires maintaining cleanliness and order at all times, including unseen spots, such as behind freezers.





MODULE

2

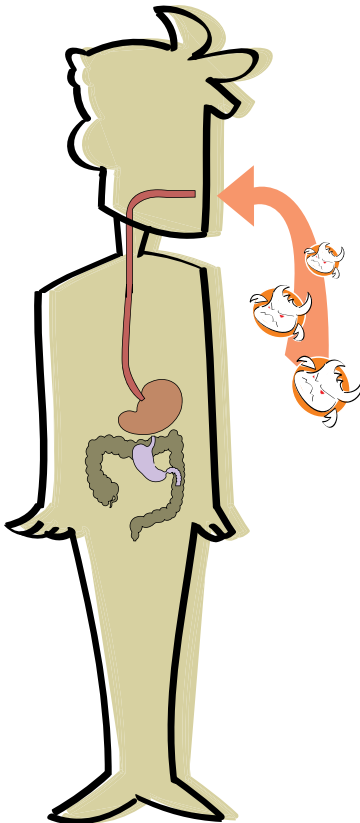
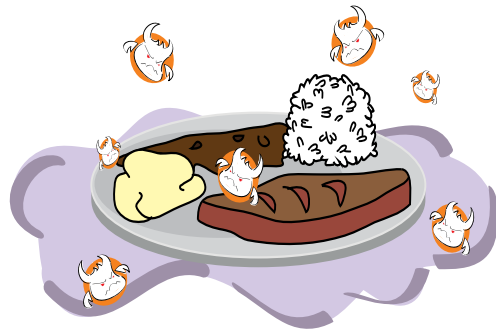
FOOD-BORNE DISEASES



What are contaminated foods?

A contaminated food is a food that contains microorganisms such as bacteria, fungus, parasites, viruses, or toxins produced by microorganisms.

A food may also be contaminated by the presence of foreign matter, such as soil, wood fragments, and hairs, or chemical contaminants, such as detergents, pesticides, or other chemical additives (3).



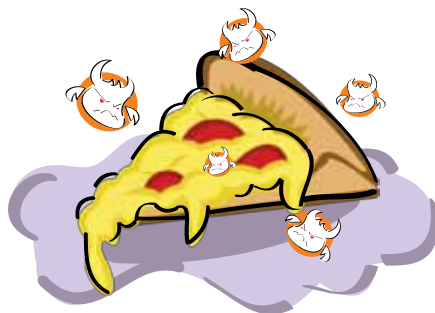
What are food-borne diseases? (FBDs)

Food-borne diseases (FBDs) are diseases of an infectious or toxic nature, caused by biological, chemical, or physical agents that enter the body using food as a vehicle (4).

Most common causes of food-borne diseases

Food borne diseases is an expression applied to all diseases acquired through the consumption of contaminated foods. The most common causes are intoxications, or poisoning, and infections (5).

- 1. Infection:** Occurs through the consumption of food contaminated with germs that cause disease, such as bacteria, larvae, or eggs of some parasites (4).
- 2. Intoxication:** Occurs through the consumption of food contaminated with toxins produced by some germs, or toxins already present in the food (4).



Most common symptoms of food-borne diseases (FBDs)



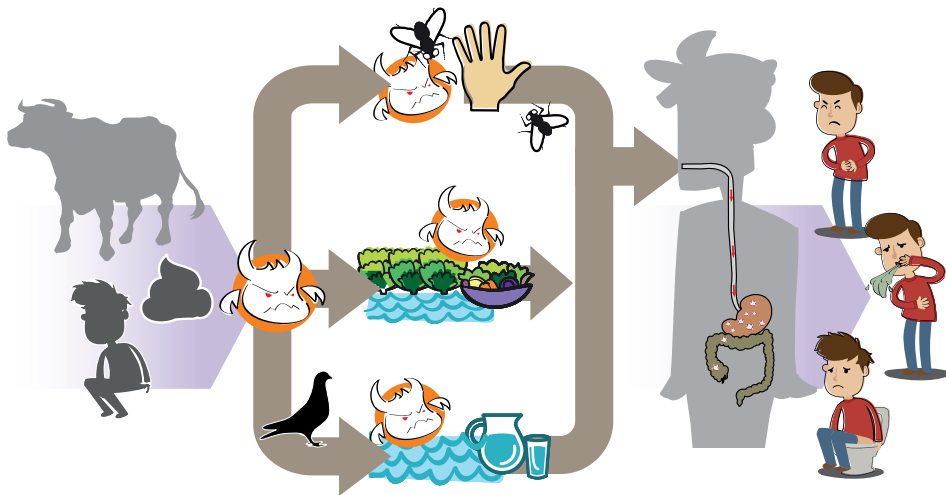
Independent from the disease, the food-borne diseases tend to share the following symptoms:

- Stomach ache;
- Vomiting;
- Diarrhea; and
- Fever and headache.

Fecal-oral epidemiologic cycle mode of transmission

This cycle is one of the most common modes of transmission of pathogens to foods.

- 1. Short fecal-oral cycle:** It occurs when someone is infected with a food-borne disease or a healthier carrier fails to wash hands after using the toilet and then handles food that is consumed by other people, who become sick afterwards (4).
- 2. Long fecal-oral cycle:** It occurs when fecal matter gets into water currents that are used to irrigate vegetables or fruit. If these, as well as hands, are not washed and disinfected thoroughly, the disease is caused by the ingestion of pathogenic bacteria.



Allergenic Foods

According to the *Codex Alimentarius* "General Standard for the Labeling of Prepackaged Foods" (CODEX STAN 1-1985), the following foods and ingredients are known to cause hypersensitivity and should always be declared:

- Cereals containing gluten; i.e., wheat, rye, barley, oats, spelt or their hybridized strains and their products;
- Crustaceans and their products;
- Eggs and egg products;
- Fish and fish products;
- Peanuts, soybeans and their products;
- Milk and milk products (lactose included);
- Tree nuts and nut products; and
- Sulphites in concentrations of 10 mg/kg or more.

Other known food allergens should be declared according to specific national regulations.



MODULE

3

Hygiene Measures to Prevent Food Contamination



Conditions pertaining to the personnel that handle food:



Food handlers play a crucial role in reducing the likelihood of contamination of the products that they prepare.

At a personal level, the basic rules a food handler must observe are as follows:

- **Optimum health condition:** Free of respiratory problems, stomach illnesses, wounds, or infection.

- **Personal hygiene:**

1. A food handler must wash his or her hands properly with water and soap before handling food. The same procedure must be followed after any activity that is likely to contaminate one's hands;



2. A food handler should shower before going to work. A daily shower with plenty of water and soap should be part of his/her daily routine; and
3. A food handler should keep his/her nails trimmed and clean, the face shaven (in case of a male), and the hair washed and bound under a cap or a scarf.

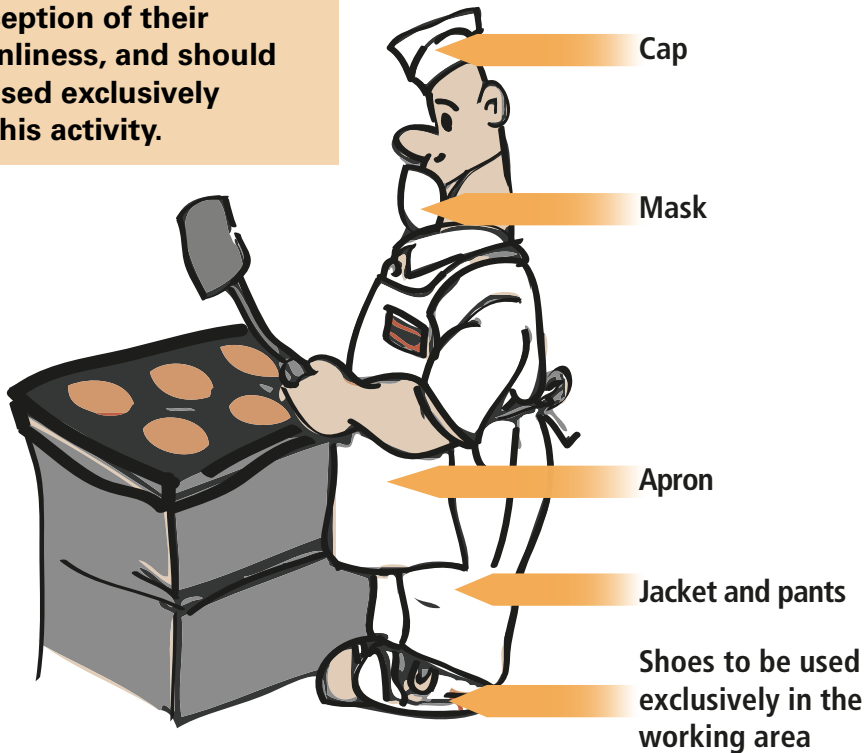


- **Clothing:** Clothes and jewellery can be a source of food contamination as they contain microbes and dirt collected during our daily activities. Therefore, jewellery should not be used by food handlers.

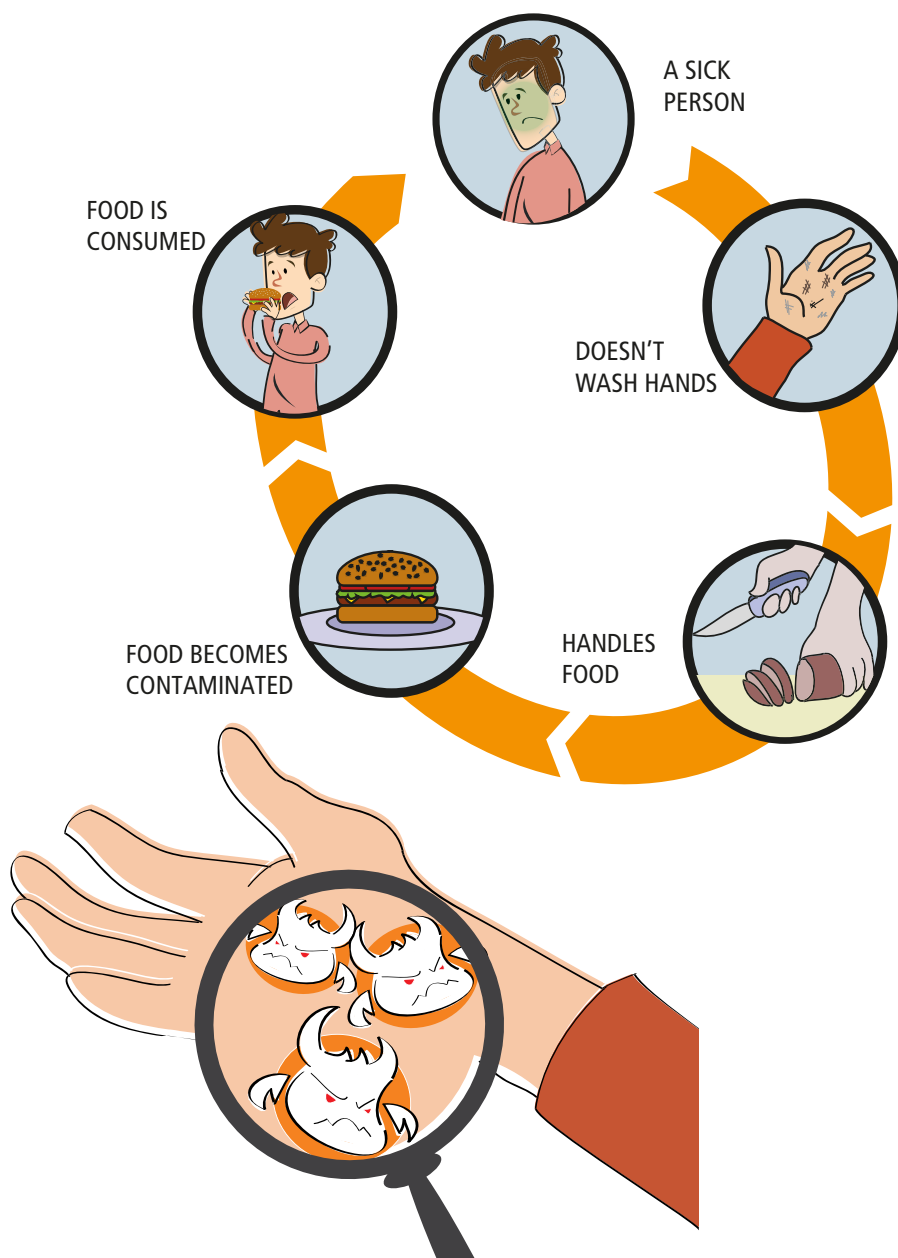
The following is a list of the appropriate clothing for a food handler:

1. A cap that covers the hair entirely to prevent hairs from falling.
2. A light-colored jacket worn solely in the work area.
3. A mask that covers the nose and mouth.
4. An apron.
5. Gloves.
6. Comfortable closed toe shoes to be worn exclusively in the work area.

Clothes should be white or light-colored for better perception of their cleanliness, and should be used exclusively for this activity.

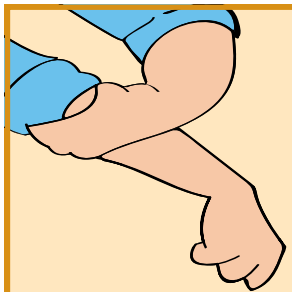


How can a disease be transmitted by unclean hands?



STUDENT

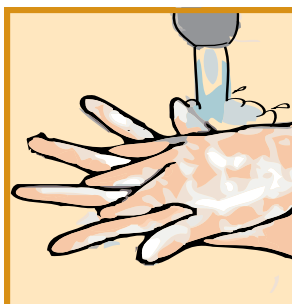
The correct way to wash hands in seven steps.



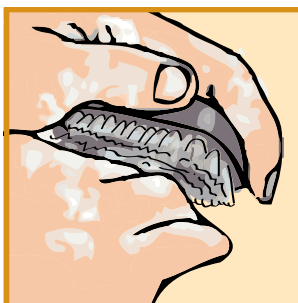
1
Pull sleeves up to the elbows.



2
Rinse hands and forearms.



3
Wash them thoroughly with soap.



4
Brush hands and nails.



5
Rinse with clean water to remove soap.



6
Dry, preferably with a paper towel or air.



7
Use a paper towel to turn off tap if not automatic or foot operated.

FOR FURTHER INFORMATION, SEE APPENDIX 1.

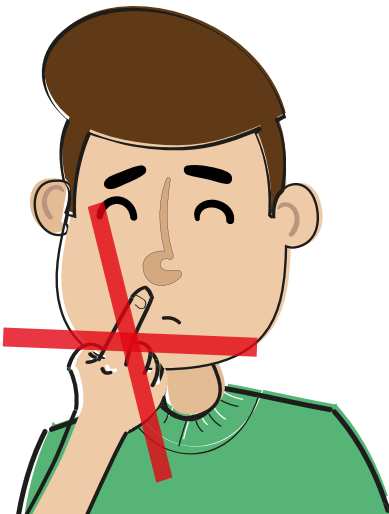
Food handlers' desirable and undesirable hygiene habits

Desirable habits

1. Thorough washing of utensils and preparation surfaces before and after handling foods.
2. Thorough washing of dishes and utensils before using them for serving food.
3. Always use soap and clean water.
4. Hold plates and serving dishes by the borders, silverware by the handle, and glasses by the bottom.



HYGIENE MEASURES TO PREVENT FOOD CONTAMINATION



Undesirable habits

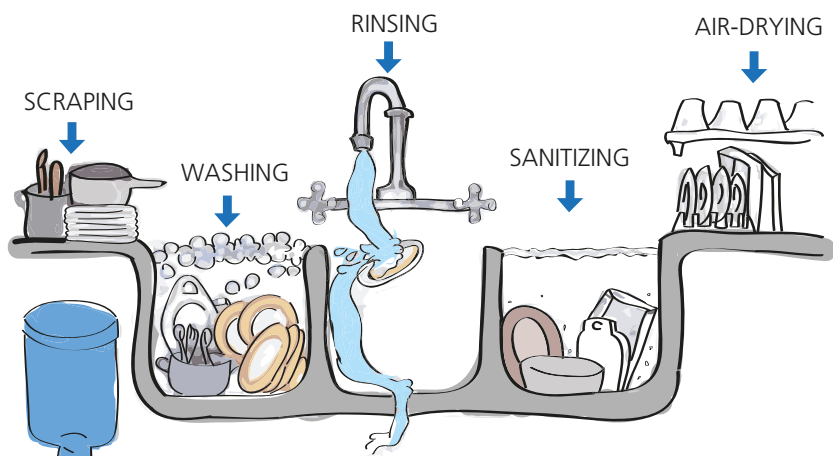
1. Cleaning or scratching nose, mouth, hair, ears, pimples, wounds, burns, etc.
2. Wearing rings, bracelets, earrings, watches, or other similar items.
3. Handling foods with hands instead of with utensils.
4. Using clothes as a cleaning or drying cloth.
5. Using the toilet while wearing work clothes.
6. Smoking near food.

Hygienic handling of equipment and facilities

This is crucial for ensuring that our materials and workplace are not a source of food contamination.

Steps for proper washing of equipment and fixtures:

- Scrape solid residues.
- Use water and detergent for washing.
- Rinse with potable water (never reuse the same water).
- Sanitize by immersing in warm water with appropriate chemical sanitizer as required by each product's instructions.
- Air-dry (do not use rags).



Fixtures: counters, refrigerators, ham slicers, etc.

- Wash and sanitize several times a day according to use.

Food storage

Food storage depends on the type of food to be stored.

Foods that require no refrigeration or freezing should be stored in a place that is cool, dry, ventilated, clean, and at a distance of at least 15 cm (5.9 in) from the walls, ceiling, and ground level.

Shelves and platforms should be used to support raw materials.

All these measures help to prevent the occurrence of rodents and insects.

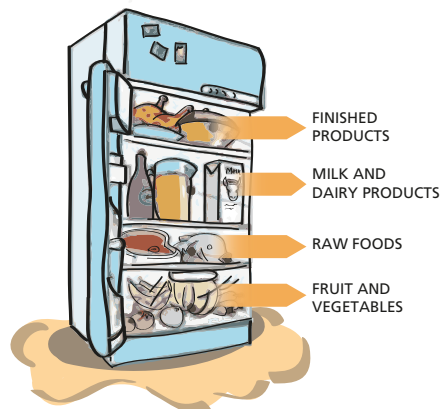


Rotation of raw materials

The proper rotation of raw materials is expressed by the “First In, First Out (FIFO)” principle; this is helped by recording the data for when each food was received or prepared.

The food handler will thus place foods with the nearest validity date closer, in front, or above those with a farther validity date.

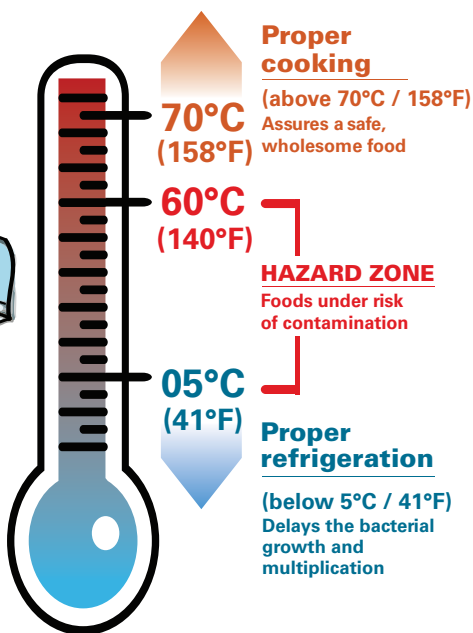
This allows for not only a proper rotation of products, but also for the discarding of products with an expired validity date.



Storage of foods

- In case there is only one refrigerator, it should be organized into sections according to the different inputs or uses.
- If there is more than one refrigerator, store raw foods in one, and ready to eat foods in the other.
- Food containers should be covered and made of food-grade material.
- Store raw meat, poultry, seafood, or eggs in a way that their liquid will not drip onto already cooked food.
- Do not store open cans with their contents in the refrigerator; transfer contents to another container right after opening the can.

Further information:
A crowded refrigerator might not reach the proper temperature to conserve the food.



Storage of chemical products

This area should be used for the storage of chemical products which are used for the cleaning and disinfecting of work equipment and utensils, as well as the establishment's hygiene materials.

This section should thus be separated from the food storage area and kept very clean and orderly, with products labeled and, in some cases, kept under lock and key.

Empty food packaging should never be used for storing chemical products; neither should food be stored in empty packaging of chemical products. Confusion in this regard might lead to serious intoxication.



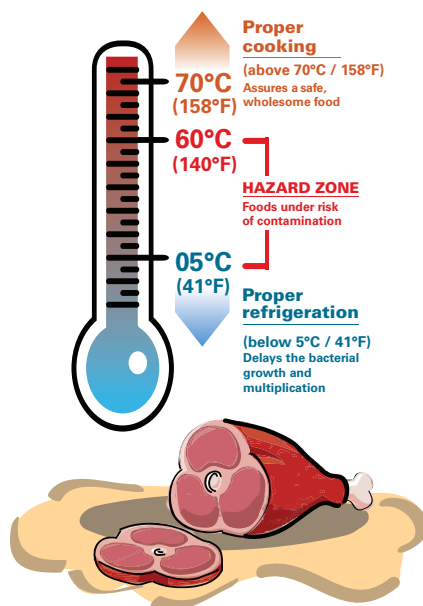
Food preparation: Control of operations subsequent to storage

Defrosting

Incompletely defrosted foods submitted to cooking run the risk of microbiologic contamination.

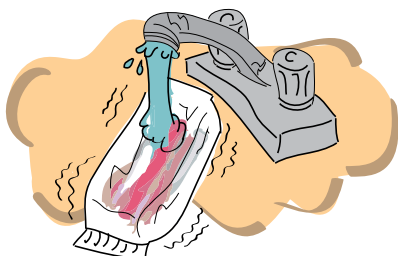
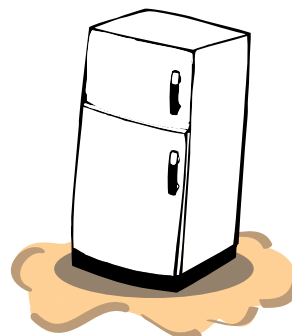
Such foods may seem cooked on the outside but remain raw in the center; bacteria in the center may thus survive.

With the help of a thermometer, always ensure that the center of the food reaches the cooking temperature and is fully cooked.



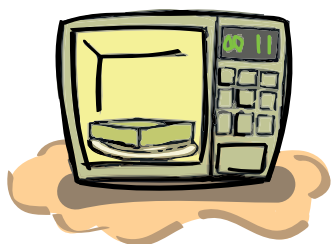
Safe methods for defrosting food include the following:

- **Refrigeration:** Once the products to be used have been chosen, they should be taken out of the freezer and placed in the refrigerator.



- **With potable water:** Running cold water over the food.

- **As part of cooking:** This method allows the food to reach the proper temperature with sufficient time to defrost the center of the food.



- **In a microwave oven:** Given the microwave's high thermal efficiency, defrosting is efficient, but should be followed immediately by cooking.

Rapid cooling of food

Excessively deep containers in a refrigerator are unacceptable for fast cooling of potentially hazardous food. Plastic containers, even if shallow, are not recommendable, either.

Instead, steel containers 10-15 cm (3.93-5.90 in) high, with a lid, are recommended.



Remember that food should always be covered to avoid cross-contamination; but cold air should be allowed to circulate freely, so that the food will not reach hazardous zone temperatures.



Visiting requirements

Visitors to places where food is prepared, particularly to processing areas, should be dressed the same way as has been recommended for food handlers; they should also comply with the same hygiene provisions indicated in this section.



Food contamination critical points

Food contamination critical points include procedure stages, locations, or operations where foods are more likely to suffer contamination or alteration.

By controlling these critical points, we can reduce the cases of food-borne diseases.

Critical points:

- Wash hands and utensils properly in preparation of handling food (never work with rusty utensils).
- Wash and disinfect utensils to be utilized.
- Wash hands before peeling or cutting food.
- Work on clean surfaces.
- Never mix food with hands (use proper utensils).
- At the final stages of food preparation, ensure that the proper temperature and cooking time are achieved.
- Keep food under refrigeration.
- Heat food to a minimum of 60°C (140°F) to eliminate microbes.
- Calculate the exact quantities to be used in a short period, thereby avoiding reheating and contaminating food.
- Pay attention to the time food is going to be at a temperature, that favours bacteria multiplication.
- Serve food on clean utensils and correctly present it, while observing hygiene habits that are noticeable to consumers.
- Use proper disinfectant concentrations for cleaning and sanitizing food utensils.

Adulteration of Food

Food defense refers to the protection of food products from contamination or adulteration intended to cause harm to the public or economic disruption. Controls are necessary to prevent intentional adulteration from acts intended to cause wide-scale harm to public health, including acts of terrorism that target the food supply. Such acts, while not likely to occur, can cause illness, death, and economic disruption of the food supply in the absence of mitigation strategies. The focus of a food defense plan is not targeted at specific foods or hazards; it requires mitigation (risk-reducing) strategies for processes in food facilities, in order to prevent acts intended to cause wide-scale harm.

SUMMARY

Although nourishment is essential to human life, food can make one sick if it is not in optimum conditions for consumption.

To be considered appropriate, food must meet the following requirements:

- **Hygiene at all stages of the food chain.**
- **Proper organoleptic characteristics, (taste, smell, texture, and color).**
- **Absence of pathogenic microorganisms or their toxins.**
- **Free of chemical substances alien to its natural composition or which are not expressly permitted.**

Ill health may be caused by different reasons, including diseases that originate in, or are transmitted by food; these are known as food-borne diseases.

Food-borne diseases occur when we consume food contaminated with pathogenic microorganisms or their toxins (bacteria, parasites, fungi, and viruses). In many cases, these microbes reach the food through the food handlers themselves.

Food hygiene is concerned with activities that should ensure that foods meet the requirements of safety and wholesomeness, and keep their nutritional values.

Food workers and all individuals that one way or another handle food have an influence on the community's health. They have most of the responsibility for making sure that the food they prepare and serve is of an optimal condition for consumption.

Hygiene measures must be taken at each step of the operation, when choosing where to buy food, at its reception, for its proper storage, during its preparation, and afterwards, in the distribution, and delivery to consumers.

Hygienic habits, such as washing hands before handling food, not coughing or sneezing on it, and avoiding handling it with exposed wounds, help prevent food from being contaminated and affecting our health.



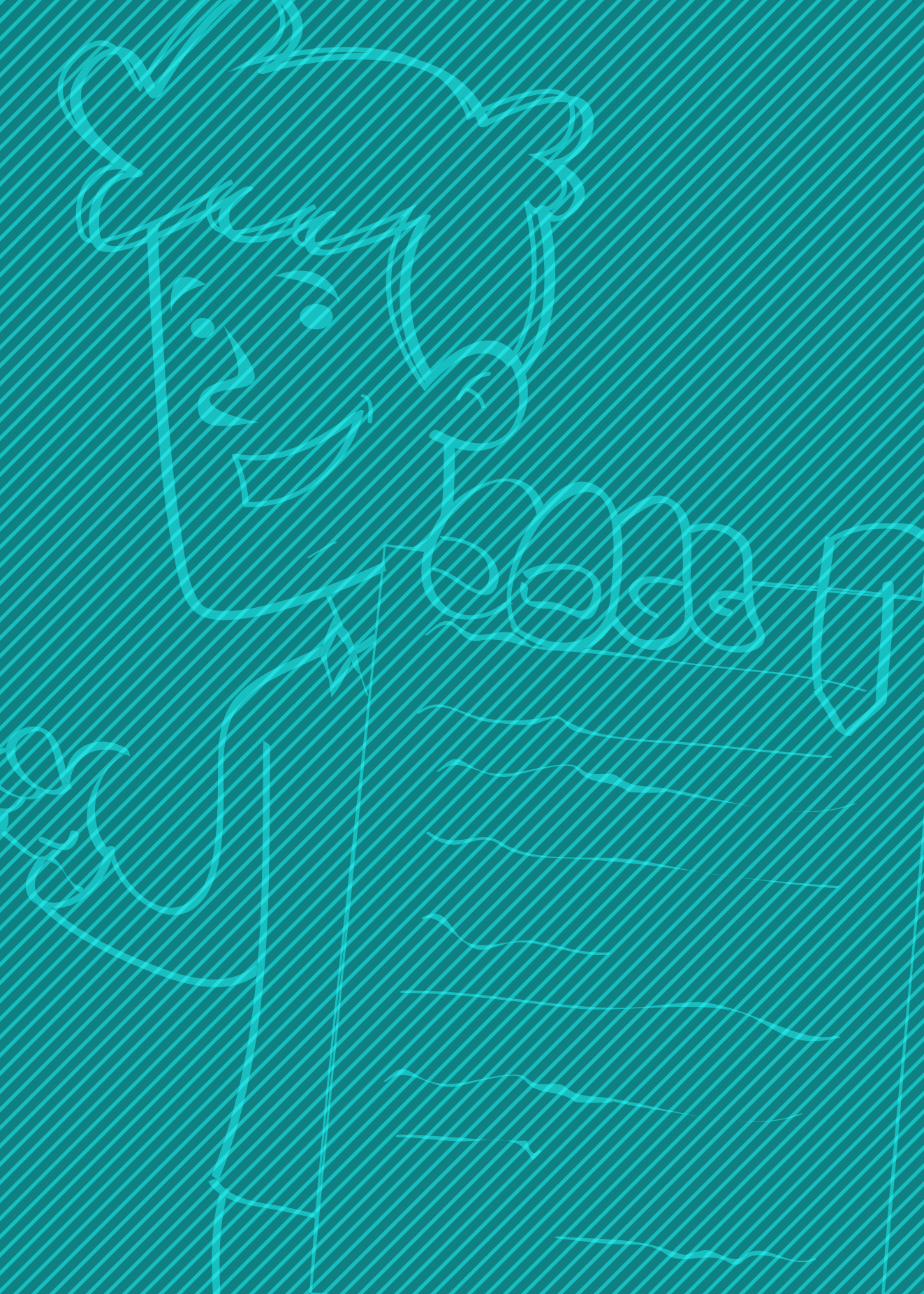
APPENDIX

APPENDIX 1

Five keys to food safety

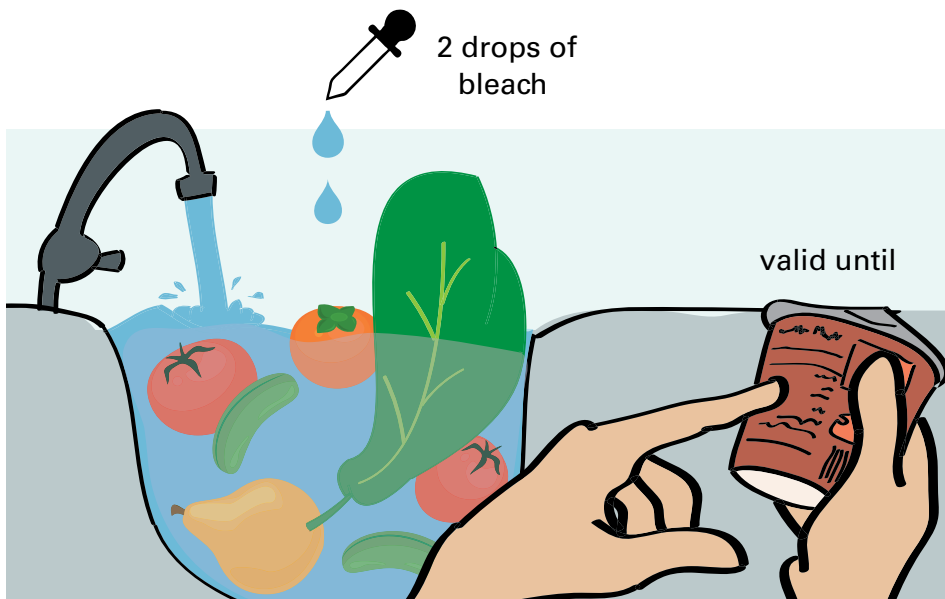
APPENDIX 2

Eat Safely Campaign



APPENDIX 1**Five keys to food safety (4")****Use safe water and raw materials**

All foods that are for consumption should come from reliable sources.



Use potable or treated water

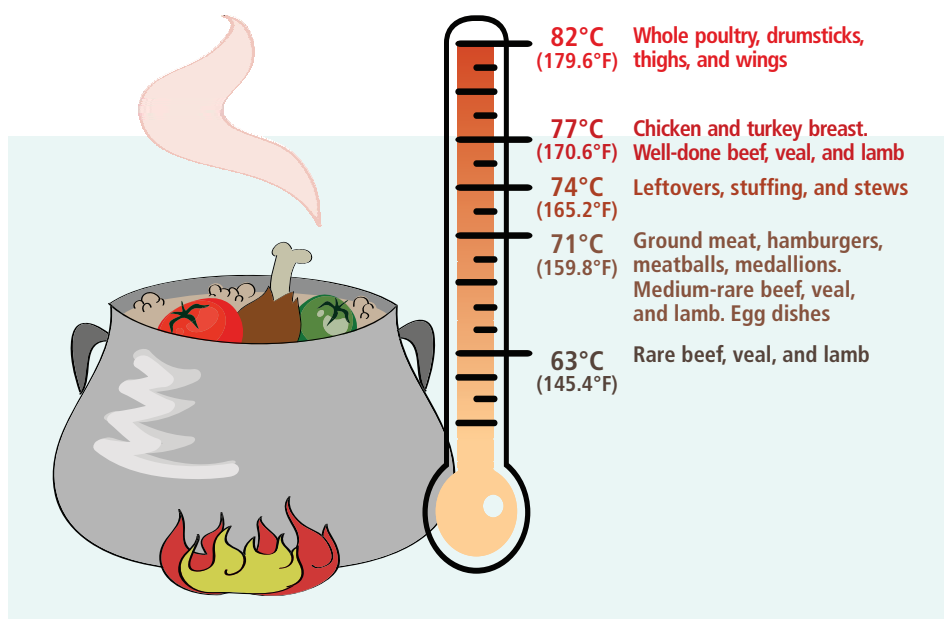
Choose processed foods

Wash fruits and vegetables

Check the expiration date and do not
consume foods with expired validity

Cook foods thoroughly

Cook foods thoroughly, especially meat, chicken, eggs, and fish.



Boil soups and stews to make sure they reach 70°C (158°F)

If cooking rare meat and chicken, make sure juices run clear, not pink

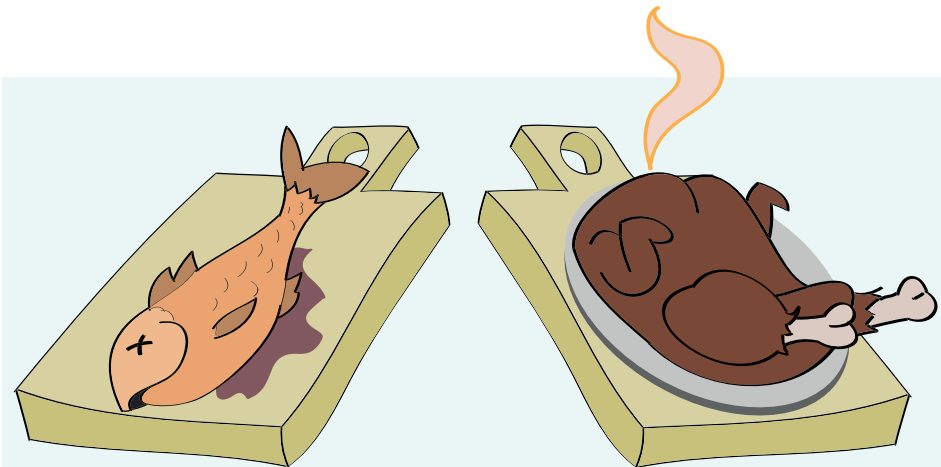
The use of a food thermometer is recommended

Fully reheat cooked food; make sure the center reaches 70°C (158°F)

Separate raw food from cooked food

Avoid cross-contamination!

Raw food may be contaminated with bacteria that migrate to cooked food or food ready for consumption.



Always keep raw food, such as chicken, meat, and fish, separate from cooked food and food ready for consumption

Maintain foodstuffs in separate containers to avoid contact between raw food and cooked food

Use different utensils, such as knives and cutting boards, when handling raw food and cooked food

How and when to wash hands?

Always wash your hands with warm water and soap, rubbing them well.



- Areas we often forget to wash
- Areas we sometimes forget to wash
- Areas we always remember to wash



Before

After

Eating

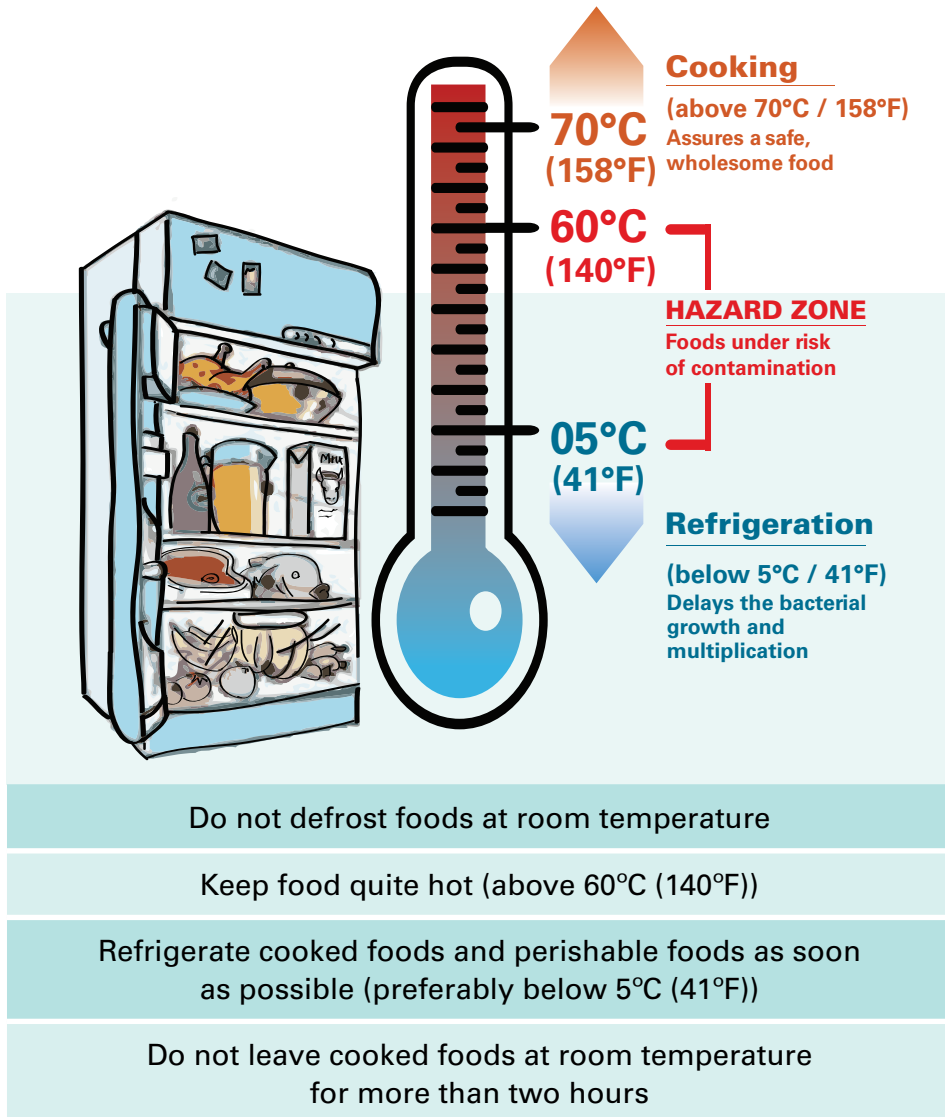
Using the toilet

Handling raw foods
(meat , fish, chicken, eggs)

Cooking

Playing in the park, touching pets
Blowing nose, sneezing, or coughing

Keep foods at the proper temperature



APPENDIX 2

Eat Safely Campaign

Eat Safely is an awareness campaign promoted by the Food Safety and Quality Team of FAO's Regional Office for Latin America and the Caribbean.

Its aim is to show in a simple and direct manner some basic precautions to be taken when handling and preparing food, to ensure safe, healthy eating, thus contributing to the achievement of one of FAO's regional priorities: to promote food safety and quality.

For the *Eat Safely* campaign, audio and printed material, such as folders and posters have been produced, as well as T-shirts and comic strips.



FOR MORE INFORMATION, VISIT
THE FAO PAGE INDICATED IN
REFERENCED LITERATURE.

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World Health Organization (WHO): <http://www.who.int/en/>

Pan American Health Organization (PAHO): <http://www.paho.org/hq/index.php>

Eat Safely campaign: <http://www.fao.org/americas/recursos/come-sano/en/>



FINAL EVALUATION

FINAL EVALUATION

Introduction

The final evaluation of food handlers is meant to assess the knowledge they have acquired during the course.

The evaluation consists of two parts:

Part 1

Multiple choice and true-and-false questions (justify FALSE answers) and;

Part 2

Figure 1: "What is wrong in this picture";

Figure 2: Look at these images and group them based on the hazard they represent and identify which are the vectors of biological hazards.

The first part accounts for **26 points**, the second, for **34 points**. Each correct answer counts for one point. Thus, **60 points** will be necessary for 100% approval. Points will not be discounted for wrong answers.

Please read each question carefully before answering.
Good luck!

PART I:

Final evaluation after FAO/PAHO-WHO course for food handlers.

01. A food handler is “anyone that directly handles food, packaged or not, equipment, and utensils used for food, or surfaces that may have contact with food; it is thus expected that a food handler meets all food hygiene requirements”.

☐ True

☐ False

If you marked False, explain why the statement is false:

02. There are three types of food contamination hazards, which may entail a public health hazard: (1) physical hazards, (2) biological hazards, and (3) chemical hazards.

☐ True

☐ False

If you marked False, explain why the statement is false:

03. Chemical hazards include the following example(s):

- I. Natural toxic substances.
- II. Industrial and environmental contaminants.
- III. Agricultural residues.
- IV. Glass fragments.
- V. Toxic substances that pass from the packaging to the food.

Answer:

- (1) Only I
- (2) Only II
- (3) I, II and IV
- (4) I, II, III, and V
- (5) All of the above

04. Bacteria are the microorganisms that have the greatest impact on food safety, as they have an optimum reproduction capacity, which allows them to form groups of colonies of millions of bacteria in just a few hours, giving origin to the contamination. On average, under ideal conditions, bacteria double in number every 20 minutes.

- ☐ True
- ☐ False

If you marked False, explain why the statement is false:

05. Biological hazards may be found.

- I. In the air.
- II. In infected wounds.
- III. In flies, cockroaches, and rodents.
- IV. On the skin of animals.
- V. In contaminated utensils.

Answer:

- (1) Only I
- (2) Only II
- (3) I, II and IV
- (4) I, II, IV and V
- (5) All of the above

06. Which of these answers are examples of sources of contamination:

- I. Sneezing over food.
- II. Touching food while having wounds on the hands.
- III. Vectors (example: flies, cockroaches) on the food.
- IV. Egg contaminated with hen feces.

Answer:

- (1) Only I
- (2) Only II
- (3) I, II and IV
- (4) I, II, IV and V
- (5) All of the above.

07. Indicate if the following statement is true: "While preparing a barbecue one may use a wooden cutting table for serving raw food and then use the same cutting table for cutting cooked food."

- ☐ True
- ☐ False

If you marked False, explain why the statement is false:

08. Indicate which of the foods listed below are at great risk of contamination:

- I. Cooked foods to be consumed cold or reheated.
- II. Raw meats, fish, and shellfish.
- III. Ground meat or meat stew.
- IV. Unpasteurized milk and dairy products.
- V. Canned food before the can has been opened.

Answer:

- (1) Only I
- (2) Only III
- (3) I, III and IV
- (4) I, II, III, and IV
- (5) All of the above.

09. Which factors favor microorganism reproduction?

- I. Nutrients.
- II. Salt.
- III. Water.
- IV. Time.
- V. Temperature.

Answer:

- (1) Only I
- (2) Only III
- (3) I, III and IV
- (4) I, III, IV and V
- (5) All of the above.

10. Good manufacturing practices (GMPs) do not include practices meant to protect the public from diseases, product adulteration, or fraud.

- ☐ True
- ☐ False

If you marked False, explain why the statement is false:

11. Food intoxication, or poisoning, and infection are two of the most common causes of food-borne diseases. Infections are caused by food contaminated with germs that cause disease, such as bacteria, larvae, or eggs of some parasites.

- ☐ True
☐ False

If you marked False, explain why the statement is false:

12. As the last link in the food chain, consumers are not responsible for ensuring food safety.

- ☐ True
☐ False

If you marked False, explain why the statement is false:

13. In light of your knowledge about food-borne diseases, indicate if the following statement is correct: "At events where there are great quantities of food, there is less probability of contamination, the prevention of which is only possible if good hygiene practices are applied to food handling."

- ☐ True
☐ False

If you marked False, explain why the statement is false:

14. Independently from the disease, food-borne diseases tend to have the following symptoms in common:

- I. Stomach ache
- II. Vomiting
- III. Diarrhea

Answer:

- (1) Only I
- (2) Only II
- (3) Only III
- (4) I and III
- (5) All of the above.

15. The basic rules a food handler must follow at work are the following:

- I. Optimum health condition.
- II. Personal hygiene (proper washing of hands, showering before going to work, trimmed and clean nails, etc.).
- III. Proper clothing.

Answer:

- (1) Only I
- (2) Only II
- (3) Only III
- (4) I and III
- (5) All of the above.

16. Which of the habits listed below are desirable in food handlers?.

- I. Cleaning or scratching nose, mouth, hair, ears, pimples, wounds, burns, etc.
- II. Wearing rings, bracelets, earrings, watches, or other similar items.
- III. Handling foods with the hands instead of with utensils.
- IV. Using clean water and soap.
- V. Wearing pieces of clothing to use as a rag to clean or dry.

Answer:

- (1) Only I
- (2) Only III
- (3) Only IV
- (4) III and IV
- (5) All of the above.

- 17.** Indicate if the following statement is true: “The storage place for products that do not require refrigeration or freezing should be cool, dry, ventilated, clean, and separated from walls, ceiling, and ground level by at least 15 cm (5.9 in).”

- ☐ True
- ☐ False

If you marked False, explain why the statement is false:

- 18.** The proper rotation of raw materials consists in applying the First In, First Out (FIFO) principle. This may be helped by writing on each product the date it was received or the food was prepared.

- ☐ True
- ☐ False

If you marked False, explain why the statement is false:

19. A crowded refrigerator will more easily reach the temperature necessary for conserving foods.

☐ True

☐ False

If you marked False, explain why the statement is false:

20. It is possible to store food products with chemical products, provided the location where foods are handled has an action plan in case of contamination by chemical hazards.

☐ True

☐ False

If you marked False, explain why the statement is false:

21. A food handler should use a thermometer to make sure the center of the piece reaches the optimum cooking temperature. We consider the following temperature ranges:

- I. Below 5°C (41°F), proper refrigeration zone.
- II. Between 5°C (41°F) and 60°C (140°F), hazard zone.
- III. Above 60°C (140°F), proper cooking zone.

Answer:

- (1) Only I
- (2) Only II
- (3) Only III
- (4) I and II
- (5) All of the above.

22. One of the correct defrosting methods used by food handlers is to leave the food on the counter at room temperature.

- ☐ True
☐ False

Answer:

23. Both cooking and freezing help reduce the possibility of food-borne diseases.

- ☐ True
☐ False

If you marked False, explain why the statement is false:

24. The safest ways to defrost foods include the following:

- I. Refrigeration.
- II. Room temperature.
- III. Potable water.
- IV. Cooking.
- V. Microwave oven.

Answer:

- (1) Only I
- (2) Only II
- (3) Only III
- (4) I, III, IV and V
- (5) All of the above.

25. Very deep containers placed in the refrigerator are an unacceptable way of cooling potentially hazardous foods quickly. Stainless steel containers 10-15 cm (3.93-5.90 in) deep with a lid are recommended.

- ☐ True
☐ False

If you marked False, explain why the statement is false: _____

26. The following are considered **CRITICAL POINTS** as regards to contamination:

- I. Proper washing of hands and utensils prior to preparing foods (never work with rusty utensils).
- II. Conserving foods under refrigeration.
- III. Reheating foods at least at 60°C (140°F) to eliminate microbes.
- IV. Calculating exact quantities to be utilized in a short period, avoiding reheating and contaminating foods.
- V. Serving food with clean utensils, hygiene habits noticeable to clients, and presenting food correctly.

Answer:

- (1) Only I
- (2) Only I, II
- (3) Only I, II, III
- (4) I, III, IV and V
- (5) All of the above.

PART II:

Figure 1: What is wrong in this picture?
List everything that is wrong in this picture.



- | | |
|----------|-----------|
| 1. _____ | 7. _____ |
| 2. _____ | 8. _____ |
| 3. _____ | 9. _____ |
| 4. _____ | 10. _____ |
| 5. _____ | 11. _____ |
| 6. _____ | 12. _____ |

Figure 2: Identify these images and group them according to the type of hazard they represent, and which are the vectors of biological hazards.



Using the number of each drawing, indicate to which group they belong:

Physical hazards: _____

Biological hazards: _____

Chemical hazards: _____

Main vectors of biological hazards: _____





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