Project: Technical assistance to improve implementation of food safety standards and disease crisis preparedness

Food Safety and Hygiene Training

for Food Businesses

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Date: ……

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EU FOOD SAFETY
AB GIDA GÜVENLİĞİ

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INTRODUCTION

Nutrition and healthy living, which are among the most basic needs of humans, are possible with the principle of food safety. The emergence of many new diseases in the world has shown the importance of food safety.

Foodborne diseases have negative consequences on human health in both developed and developing countries. These diseases pose serious risks especially to children, the elderly and pregnant women. The dangers created by such diseases cause people to lose their health and lives.

- **Even foods that look clean and healthy,** taste and smell good can sometimes cause very serious health problems.

- **The way to prevent food poisoning or foodborne illnesses** is to produce and serve food safely.

1. FOOD SAFETY

Food safety means that there are no hazards in foods that may harm the health of consumers or that they are at an acceptable level.

Foodborne hazards can be of

microbiological,

chemical,

physical origin

in nature and are usually not visible to the naked eye.

These hazards, which cannot be identified by the senses alone, pose a great risk to public health by causing foodborne diseases.

1.1. WHAT IS SAFE FOOD?

Food that is clean, unspoiled and suitable for consumption without any harmful substances, protected from physical, chemical and microbiological contaminants at every stage of the food chain from field to fork / farm to table, is called '**SAFE FOOD**'.

SAFE FOOD FROM FIELD TO FORK

In order to prevent food from becoming contaminated and harmful to health, we must comply with the rules of cleanliness, hygiene and food safety at all stages from purchasing to consumption (service). The control system that ensures this is called **FOOD SAFETY SYSTEM**.

1.2. FOOD HYGIENE

It is the totality of all kinds of precautions and conditions required to control foodborne disease risks and ensure food safety, and to ensure its suitability for human consumption. When it comes to hygiene, the first thing that comes to mind is disinfection.

(FOOD HYGIENE = CLEANING + DISINFECTION)

DISINFECTION

Disinfection is the process used to destroy and/or limit the reproduction of microorganisms that cause disease or spoilage of food, using chemical-physical methods and substances.

2. FOOD POISONING

Food poisoning is the name given to the disease caused by eating foods contaminated with **various microorganisms or their toxins** and entering the digestive system.

If safe food is not consumed, food poisoning occurs and negative symptoms occur in people's normal health conditions depending on the food they eat.

2.1. SYMPTOMS OF FOOD POISONING

Symptoms of poisoning: **abdominal pain, nausea, vomiting, diarrhea, stomach cramps and sometimes high fever**. Symptoms can appear within a few hours or a few days, depending on the source of infection.

If you have bloody diarrhea, a stiff neck with diarrhea, severe headache or fever, if your symptoms of poisoning continue for more than two days, see a doctor immediately.

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2.2. HIGH RISK GROUP INDIVIDUALS

- **Babies and young children**
- **Pregnant women**
- **Elderly people**
- **People with weak immune systems (People receiving cancer treatment, etc.)**

3. CONTAMINATION RISKS IN FOOD

- **Chemical:** Cleaning products, polish-paint type substances, toxic chemicals (agricultural drugs, pesticides), food additives

- **Physical:** Any foreign substance mixed into food, hair, bandages, metal or glass pieces, toothpicks, nail pieces

- **Biological**: Microorganisms that do not normally exist in food

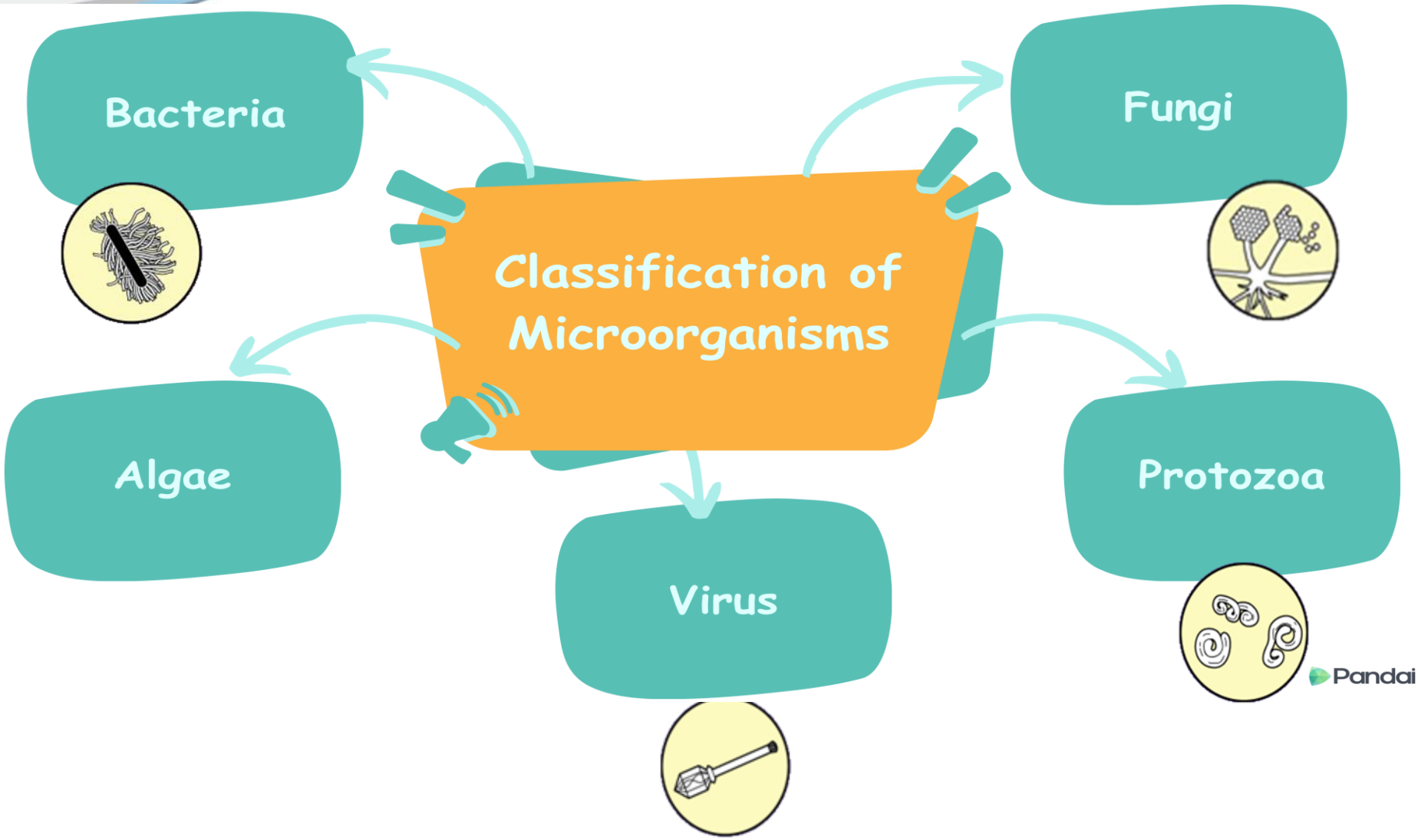
What is a microorganism?

Microorganisms are single-celled organisms that are too small to be seen with the naked eye (mold, yeast, etc.)

Bacteria, molds, yeasts, and viruses are organisms that fall into the microorganism group. They are found almost everywhere, especially in dirty places.

When microorganisms multiply and exceed a certain number, they threaten human health.

4.1. CLASSIFICATION OF MICROORGANISMS



4.2. BENEFICIAL AND HARMFUL MICROORGANISMS

Microorganisms are divided into two groups: beneficial (cultures) and harmful (pathogenic or spoilage)

- **Beneficial**

yeast
- bread
- beer

mold
- cheese
- yoghurt

bacteria
- **bakery**
- **sauces**

- **Harmful**

pathogen:
- Listeria, salmonella

spoilage
- molds (hazelnuts)
- yeast
- lactobacilli

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5. Sources of Microorganisms Contamination:

- Undercooked food
- Unclean kitchenware
- Sick staff
- Poor personal hygiene

6. FOODS SENSITIVE TO SPOILAGE

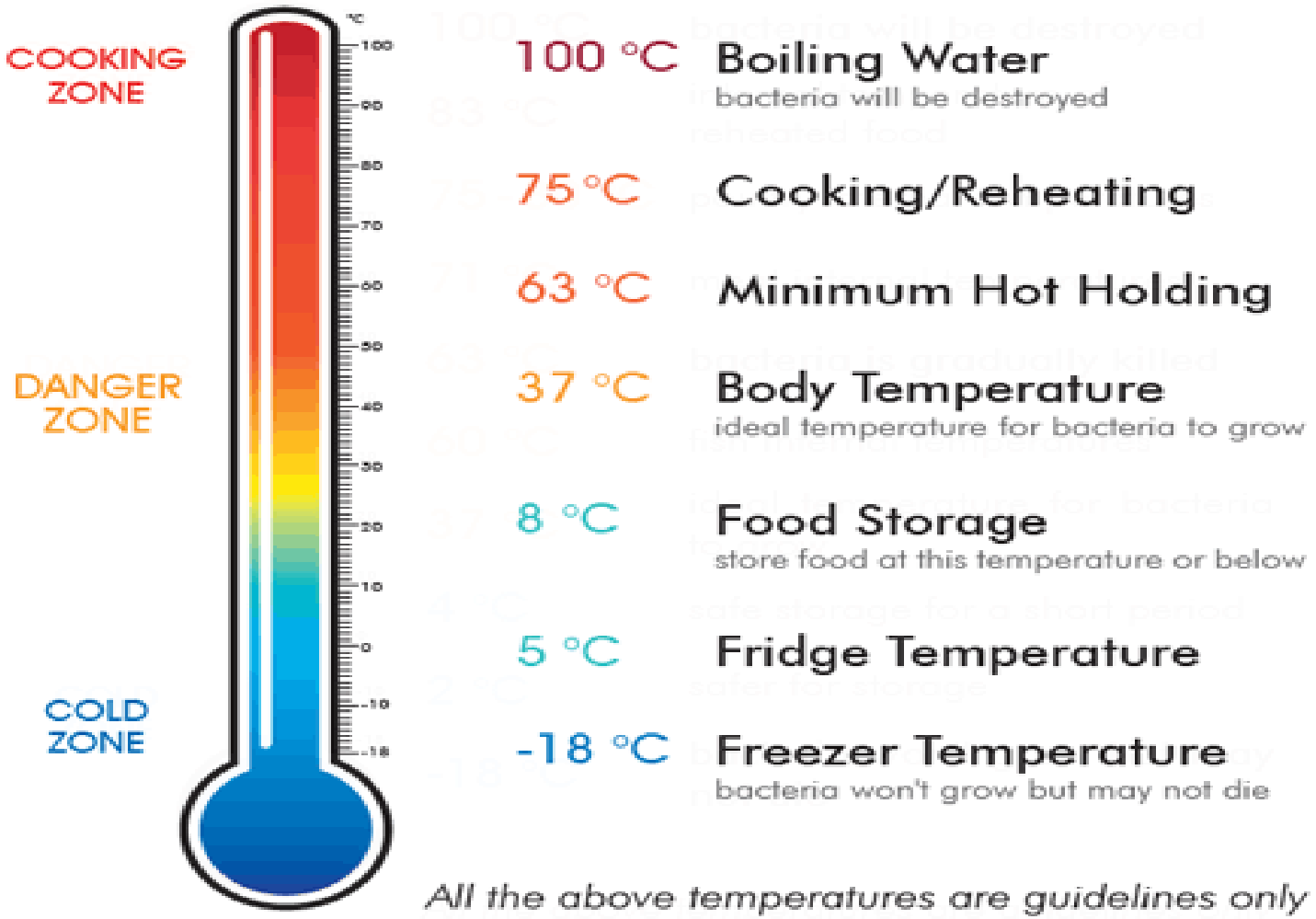
- MILK AND DAIRY PRODUCTS
- EGGS
- RED/WHITE MEAT (chicken and fish etc.)
- POTATOES, PEAS
- RICE
- MELONE
- TOMATOES
- OIL MIXTURES (HUMMUS) ETC.

7. Factors Causing Microorganisms to Multiply in Foods

1. Temperature
2. Oxygen
3. Humidity
4. Food (protein, carbohydrate)
5. Acidity (pH)
6. Time

7.1. Effect of temperature on mgrowth of microorganisms

Microorganisms can easily reproduce between temperatures of **5 °C and 63 °C**.



7.2. Effect of time on growth of microorganisms

- In a food left at dangerous temperatures, pathogen growth reaches dangerous levels after 2 HOURS.
- (Room temperature between 25 degrees and 40 degrees is very dangerous)

DETECTION OF HAZARDOUS MICROORGANISMS

The presence and amount of microorganisms in foods can be determined with laboratory tests.

8. HOW TO PREVENT MICROBIAL GROWTH IN FOOD PRODUCTION?

- Personal Hygiene
- Production Area Infrastructure
- Cleaning and Sanitation Practices
- Pest Control
- Temperature-Time Practices

9. FOOD SAFETY MANAGEMENT SYSTEMS

- **What is HACCP?**

Hazard Analysis and Critical Control Points (HACCP) is a systematic and science-based approach to food safety. It is a preventive system that identifies, evaluates, and controls potential food safety hazards throughout the entire food production process. HACCP is designed to ensure the safety of food products by reducing the risk of hazards such as biological, chemical, and physical contaminants.

Develop and implement a HACCP Plan (for HACCP Certification):

Create a Hazard Analysis and Critical Control Points (HACCP) plan for your specific product or process. This plan involves identifying hazards, determining critical control points, establishing critical limits, and developing monitoring and corrective action procedures.

9.1. What is GMP?

Good Manufacturing Practices (GMP) is a set of quality assurance and quality control guidelines and practices that are applied in various industries, including pharmaceuticals, food, cosmetics, and medical devices. GMP encompasses a series of principles and regulations designed to ensure the consistent production of safe, effective, and high-quality products.

The specific requirements and regulations for GMP can vary from one industry to another, but the core principles remain largely consistent.

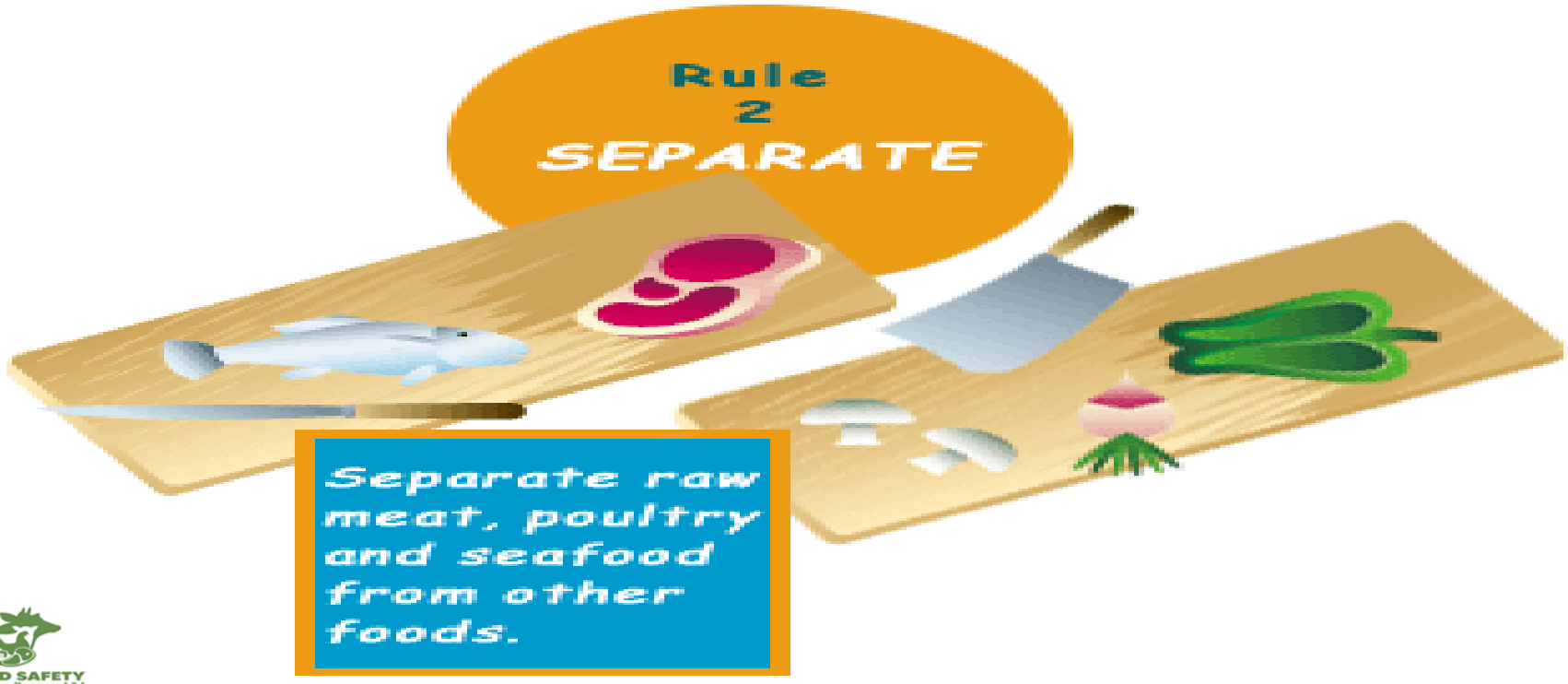
- **Implement GMP Practices (for GMP Certification):** Ensure your manufacturing practices align with Good Manufacturing Practices (GMP) principles. This involves adopting specific procedures and processes for production, quality control, and record keeping.
Maintain detailed records of all relevant processes, procedures, and documentation associated with your HACCP plan and GMP practices.

10. STORAGE OF FOODS

- Foods purchased can be stored in the refrigerator, deep freezer or under appropriate conditions.
- Foods that pose a risk in storage such as meat, milk and its products, raw vegetables etc. should be sorted in a way that they never touch each other.
- Older materials should be placed in the front, newer materials should be placed in the back shelves **(FIFO) (First In First Out)**

11. FOOD PREPARATION

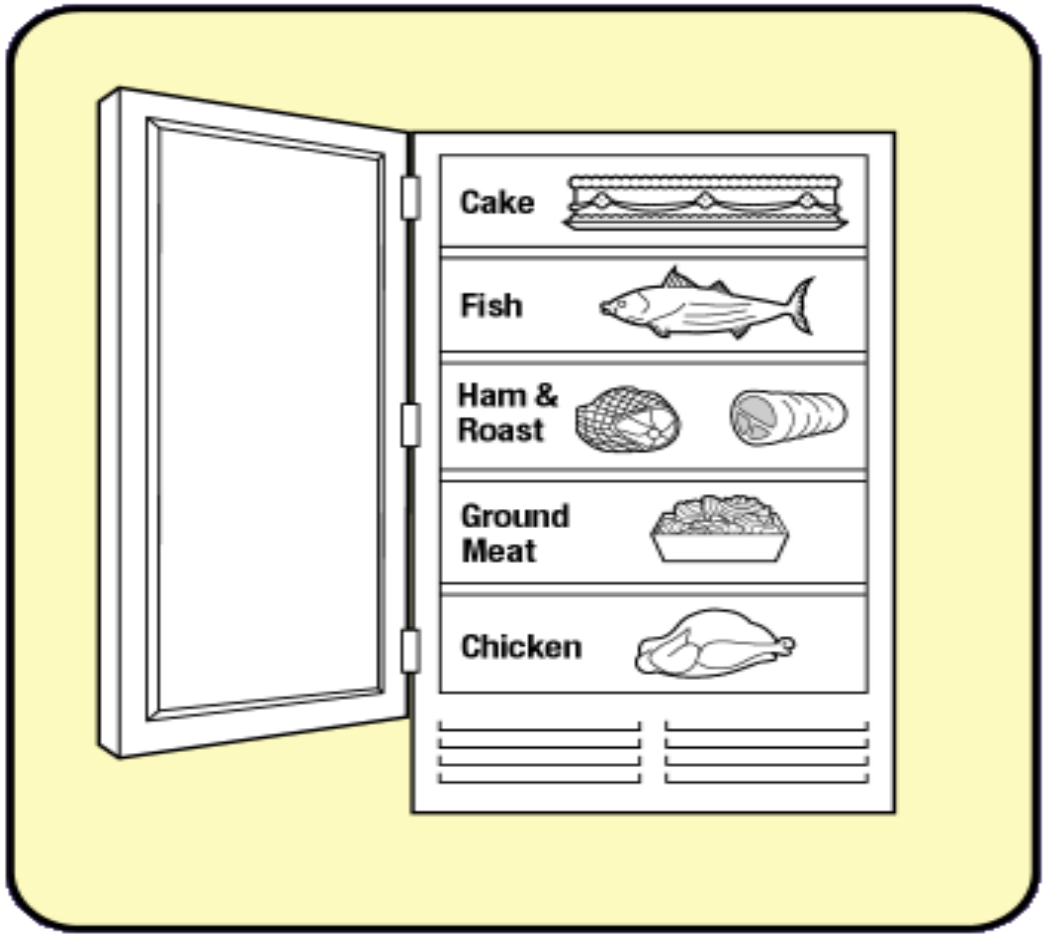
- There is a high risk of **cross-contamination** during food preparation. Important points such as using different chopping benches for different foods and sanitizing tools and equipment should be taken **into consideration.**



11.1. FOOD STORAGE REFRIGERATOR PLACEMENT

- When placing foods in the refrigerator, they should be arranged **from top to bottom, from clean to dirty.**

- Ready-to-eat foods,
- Vegetables and fruits
- Fish, seafood
- Meats
- Minced meat
- Chicken



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12. CROSS CONTAMINATION

- **Cross-contamination** is the spread of microorganisms from a surface or food to another food. Microorganisms can spread from unwashed hands to the preparation counter, tools and equipment, or from food to another food. Cross-contamination can occur at any point in the food production area. Therefore, we must determine the critical points and eliminate the risk of cross-contamination.

12.1. WAYS TO PREVENT CROSS CONTAMINATION

1. Using separate tools and equipment for each type of food.

2. For example, using separate tools and equipment (containers, chopping boards, counters, etc.) for raw chicken, vegetables, and raw meat.

3. To make this distinction, for example,

a yellow chopping board and knife can be used for raw chicken,

a green chopping board for vegetables,

a red chopping board for red meat,

a blue chopping board for fish,

a white chopping board for dairy products, and

a brown chopping board and knife for bread.

12.1. WAYS TO PREVENT CROSS CONTAMINATION CONT.

4. If there is not enough space in the factory and different products must be prepared in the same areas, these products should be prepared at different times.

Food Poisoning Risk + Allergen Risk!!!

12.1. WAYS TO PREVENT CROSS CONTAMINATION CONT.

5. Cleaning and sanitizing all surfaces, tools-equipment, pots and pans used in the production area.

It is not enough to rinse the chopping board on which the raw chicken was prepared. It is necessary to wash, rinse and sanitize respectively.

6. PERSONAL HYGIENE is very important in preventing cross contamination.

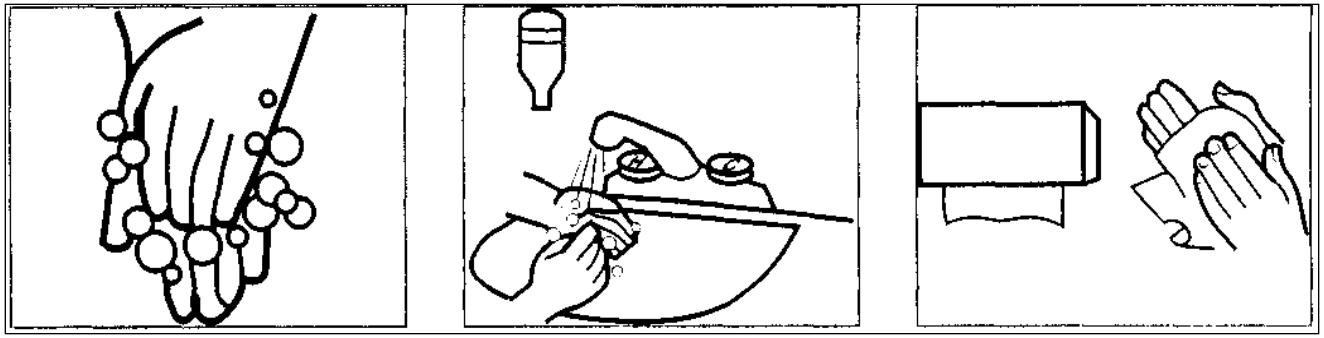
***Personnel is one of the most important sources of contamination in food businesses. Staff should be provided with continuous training on this issue

*Hair and nails should be cut short. Men should not have a beard or moustache. Hands should always be clean and there should be no open wounds. Production clothes and aprons should be used for the kitchen.

13. The Importance of Hand Hygiene

Proper hand washing is essential to prevent cross-contamination.

Hand washing should be done for a minimum of 20 seconds as shown in the figures below.



13.1. Washing our hands;

- At the beginning of every job
- Raw meat, chicken etc. after contact,
- Before touching ready-to-eat foods,
- Every time you leave the toilet
- After smoking and using tissues
- After handling the money
- After handling dirty tools and equipment
- After coughing and sneezing
- After handling the garbage
- Before serving the food, be sure to wash it hygienically.

13.2. Use of Gloves

Gloves can reduce the risk of pathogen transmission as long as they are used correctly, but they cannot completely prevent the transfer of pathogens.

Just as it is necessary to wash hands at regular intervals, gloves must be changed at regular intervals. Gloves should be worn after washing hands. In addition, hands should be washed again after using and discarding gloves. **CLEAN GLOVES ARE WORN WITH CLEAN HANDS…**

After a certain period of time, gloves lose their protective and hygienic properties. **(One change every 30 MINUTES depending on the nature of the job…)**

At the same time, hands that stay in gloves for a long time may sweat, which means that more microorganisms are present on the hands than normal.

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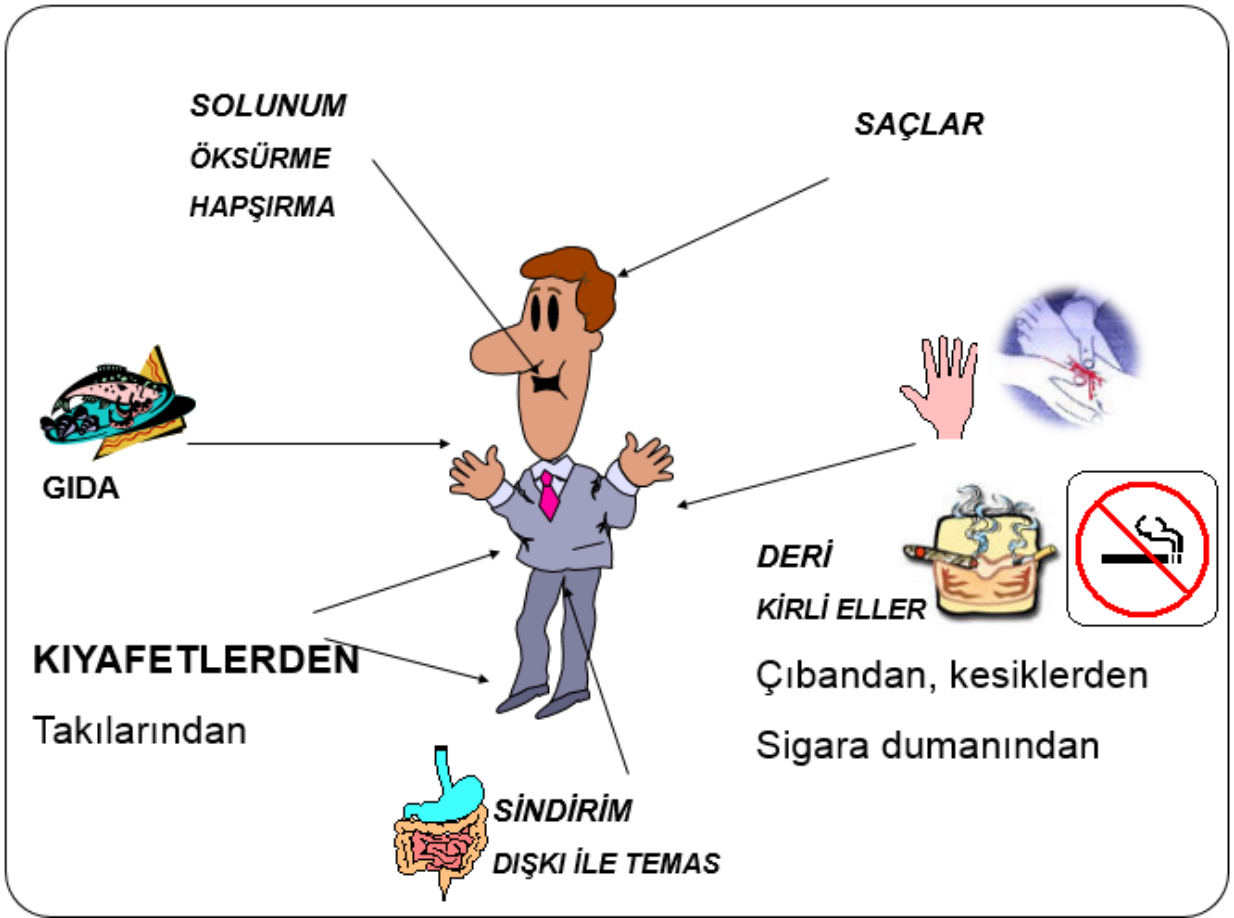
13.2. TRANSMISSION OF MICROORGANISMS FROM BODY

Sources of microorganisms in our body;
Contact with hands, skin, hair, nails, jewellery, clothes, feces, mouth-nose (coughing, sneezing).



14. COOKING OF FOODS

- At the end of cooking and heating the food, the center point temperature should be measured and MINIMUM SHOULD BE 75 ºC.
- Cooking and heating should not be done for less than 2 minutes at 75 ºC.
- Leftover heated food should be destroyed. Foods should only be heated once
- When cooking liquid foods, they should be mixed in equipment such as wide-based pans to ensure homogeneous distribution of temperature.
- Foods to be served hot after cooking should be kept above 63 ºC. Foods to be served cold should be cooled (0-5 ºC).

15. STORAGE AND TEMPERATURE

Cold storage:

Foods are stored at temperatures of 5 ^{o}C and below. The aim here is to slow down the growth of microorganisms in ready-to-use fresh products, to preserve the freshness of the food and to extend its life.

The point to be considered is that the internal temperature of the food is below 5 ^{o}C.

Storage in the Freezer:

It is a type of storage of food at temperatures below freezing temperature. (temperatures at or below -18^{o}C).

The development rate of microorganisms is not stopped, but is minimized.

15.1. Dry Food Storage:

*When storing dry food, the environment must be dry and cool.

*Things to consider when stocking dry food: ambient temperature

*It must be between 10-21 ºC and air circulation must be ensured.

*It is appropriate for the humidity to be 60-70%.

*The shelf life of stored foods should be checked weekly.

15.2. THE IMPORTANCE OF TEMPERATURE AND TIME IN PREPARATION

- If products prepared before cooking or serving will be kept for more than 4 hours, they should be kept at temperatures of 5 ºC and below.
- Example: Salads, appetizers, shredded meats, etc.
- Great care should be taken when thawing frozen products, and unused foods should not be frozen again after thawing.

16. CLEANING AND DISINFECTION PLAN

Cleaning control programs should be made by the food business operator/responsible manager, and in addition to cleaning all areas, the method and frequency of cleaning and disinfection of critical areas, materials, tools and equipment should be determined in advance.

These programs should be hung in the relevant parts of the workplace or kept in a file and the cleaning and disinfection processes should be recorded.

16. CLEANING AND DISINFECTION PLAN cont.

- ✓ One person from the workplace staff should be assigned to be responsible for business cleaning.
- ✓ Cleanliness must be checked.
- ✓ There should be written, formal, cleaning procedures and schedules for each section. These should be clear, legible and easy to follow.
- ✓ In order to distinguish cleaning workers from others, their protective clothing should be of different colors, different designs, different hats or different symbols on their clothes.
- ✓ Cleaning and disinfection should be considered part of production.

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16.1.HYGIENE AND CLEANING

HYGIENE

CLEANING

Removing visible dirt from the environment

DISINFECTION

Removing invisible dirt (disease-causing microorganisms) from the environment

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16.2. Manual Cleaning

- The cleaning solution should contain substances and concentrations that will not irritate the skin.
- The temperature of the cleaning solution should not fall below 35 C, otherwise oily dirt cannot be completely cleaned. It should not exceed 45-50C, the cleaning person's hand may be burned.
- The brushes used should be made of materials that will not cause scratches and cracks on the equipment, and metal cleaning wires should be avoided.

16.3. Disinfection after Cleaning

- If disinfection is not applied after the cleaning process on food contact surfaces in food establishments, the desired benefit cannot be obtained from the cleaning.
- Because microorganisms that become free during the cleaning process can spread over a larger surface and continue their reproduction in the new environment.
- Preventing this spread is possible with the disinfection process.

17. Disinfection Methods

1. Thermal Disinfection: The use of hot water is an effective sanitation method for food contact surfaces. Small parts can be sanitized by immersion in water at an average temperature of 80°C or higher.

The fact that hot water has no toxic effects, is cheap and convenient, and does not require drying makes disinfection with hot water advantageous.

17. Disinfection Methods Cont.

2. Disinfection by radiation: Radiation in the form of ultraviolet, high-energy cathode or gamma rays destroys microorganisms. However, this method is not suitable for food businesses as its use requires great care and attention.

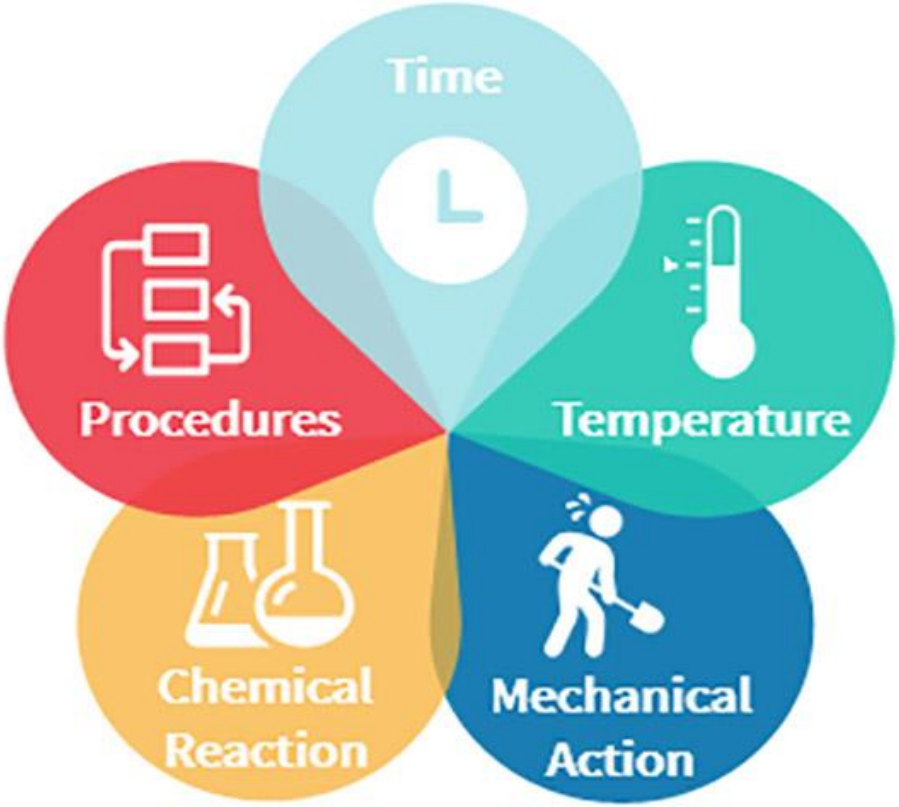
3. Chemical disinfection: In cases where heat treatment cannot be used, it is used especially after manual cleaning and on-site cleaning processes applied to some equipment.

Disinfectants show their effects within 2-30 minutes, depending on their structure.

17. Disinfection Methods Cont.

- **Five Factors of Cleaning and Disinfection:**

There are five key factors involved when cleaning that are equally important: time, temperature, mechanical action, chemical reaction and procedures.



17.1. TO ENSURE A HYGIENIC ENVIRONMENT;

"cleaning and disinfection" should be done together on the surfaces in contact with food.

Dirty surface, clean surface, disinfected surface

= Microorganism

= Dirt

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CONCLUSION

The way to prevent food poisoning or foodborne diseases is safe food production and service.

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THANK YOU FOR YOUR ATTENTION

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