Learning Objectives:

1. Discuss the importance of food safety;
2. Apply proper food safety practices by:
   ✔ Learning to identify and classify the risks and hazards to food safety;
   ✔ Understanding the fundamentals to prevent food borne illness and food contamination;
   ✔ Learning the various factors affecting microbial growth; and
   ✔ Guiding food handlers and children the importance of food safety and hygiene.

From garden to plate make food safe: reduce food hazards, prevent food spoilage, prevent contamination, prevent food borne illness with frequent handwashing, and practice good personal hygiene.
Bacteria are causative agents in 60% cases of foodborne illness requiring hospitalization.

Key Point 1
Unsafe food can also lead to poor nutrition.

What is Food Safety?
Handling, storing, and preparing food that will prevent infection and making sure our food have enough nutrients to keep us healthy. Unsafe food and water are exposed to dirt and germs, or may even be rotten, which can cause diseases such as diarrhea, meningitis, etc., that can make people very sick or cause death.

When sick, we are weak and would have difficulty working or concentrating at school. Some infections also make it difficult for our bodies to absorb the nutrients needed to be healthy. Unsafe or stale foods lose nutrients needed for a healthy diet.

What Makes People Sick from Food?

3 Major Hazards:

1. Physical
Objects that may cause injury such as broken glass, hair, metal shavings, jewelry, scrubbing pads or any objects that are not edible.

2. Biological
Microbiological agents are mostly invisible to the naked eye such as bacteria, viruses, and parasites. These may come from the soil (especially when organic materials which are not yet well-decomposed are used in the garden) or from contaminated water used in crop production.

3. Chemical
Poisonous substances like cleaning agents, pesticides, and other chemicals and plants that are harmful and not intended for human consumption.

Bacteria or pathogen can be found everywhere.

Key Point 2
The lesser food hazards, the safer the food: reduce hazards from garden to plate.
What is Foodborne illness?

Foodborne illness, also called food poisoning, is any illness resulting from eating food already spoiled or contaminated with pathogenic bacteria, viruses, or parasites as well as chemical or natural toxins such as poisonous mushrooms and various species of plants that are not suited for human consumption.

Remember

It is important to understand that contaminated food will usually smell fine, look safe and taste good but can still make someone very sick.

4 Causes of Foodborne Illnesses:

1. **Bacteria** are the most common causes of food borne illness. These harmful organisms multiply very fast when food is kept in the “temperature danger zone”.

2. **Viruses** also cause food borne illness; Hepatitis A is spread by a virus. A person may have the virus and not know it. When a food worker does not wash their hands well, viruses can be transferred to the food.

3. **Parasites** are tiny worms or bugs that may live in fish and meat. Proper storage and freezing can destroy parasites.

4. **Chemicals/ Detergents** such as cleaners and air fresheners or insect sprays can cause food borne illness. Keep them out of preparation areas and have them properly labeled.

Key Point 3

When in doubt, throw it out!
Remember FATTOM:

<table>
<thead>
<tr>
<th>Letter</th>
<th>Word</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>Food</td>
<td>Food, if not kept properly, can be a good site for bacteria to grow.</td>
</tr>
<tr>
<td>A</td>
<td>Acidity</td>
<td>Foods can have longer shelf life with acids such as citrus (e.g. kalamansi) or vinegar. Foods with little or no acidity are those where bacteria or pathogens grow best.</td>
</tr>
<tr>
<td>T</td>
<td>Time</td>
<td>Bacteria needs time to grow and reproduce on the food. If foods are not kept out of the temperature danger zone for 2-4 hours, bacteria can grow and multiply at a higher rate.</td>
</tr>
<tr>
<td>T</td>
<td>Temperature</td>
<td>At the temperature danger zone, bacteria grow best. Food should be stored, outside of the temperature danger zone. Freezing and cooling can reduce or hold the activities of bacterial growth.</td>
</tr>
<tr>
<td>O</td>
<td>Oxygen</td>
<td>Food exposed to open air has higher chances of spoiling. There are bacteria that need oxygen to multiply. Cover and store food properly.</td>
</tr>
<tr>
<td>M</td>
<td>Moisture</td>
<td>Moisture is water; like humans, most bacteria need water to grow and survive. Moist food may readily develop food spoilage if not properly stored or handled.</td>
</tr>
</tbody>
</table>

Key Point 4

Understanding these six conditions (FATTOM) will help prevent foodborne illnesses from occurring.

**Improper thawing allows bacteria to rapidly grow in the outer layers of the food while the core is still frozen. Do not thaw food at room temperature or in warm water.**
Tips on Proper Thawing, Holding, Storing and Reheating Thawing

Melting down frozen food to an appropriate cooking condition

3 Steps for Thawing Foods:

1. When possible, transfer the food from the freezer to the refrigerator. This method will keep the food at 5°C and out of the Danger Zone, but may take several hours or days to melt the frozen food depending on the amount. Be sure to put different raw meats in separate containers to prevent the juices from transferring or dripping onto other foods.

2. Thaw food under cold running water, never in warm or hot.

3. Thawing food in hot water or in the microwave or in other immediate medium is appropriate only if the food will be cooked immediately.

Hot Holding and Storage

1. Keeping the food hot may require hot holding equipment. Stir the foods from time to time if food will be kept in hot holding containers or equipment to avoid drying or build up on the sides of the containers.

2. If hot holding equipment is not available, ensure that foods will be served immediately within 2 hours after cooking.

3. Cover the food properly to keep the food warm and safe from contaminants and hazards.

4. If the food will be stored, ensure the containers are clean, safe and covered.

5. Make sure left over food were not contaminated during chilling or freezing.

6. Avoid combining different food items in single containers.

7. Food should not be left out to cool at room temperature for more than two hours.

8. DO NOT REFRIGERATE FOOD WHILE HOT. Ensure food is no longer hot before storing or covering to prevent moisture from building-up inside containers and to ensure refrigerator temperature will not be compromised.

9. In the storage(refrigerator): store raw meat, fish, and poultry in separate containers on the lowest shelves of the refrigerator. Do not let these items drip onto foods that will not be cooked before serving.
Example of how to properly store food in refrigerator

Cross-contamination happens when bacteria and viruses are spread or transferred from one place to another, such as when raw or unclean food get into food that are ready-to-eat.
**Food Storage Limits**

1. Food should always be used: according to expiry dates or according to purchased dates. Be conscious of the quality and the purchase dates of the perishable goods; ensure that fruits, vegetables and other goods are used accordingly to avoid or minimize wastages.

2. Find ways to use leftover items or opened ingredients in your menu plans without compromising food safety. Keep opened or pre-used ingredients in proper storage marked with opening dates or discard dates.

**Reheating**

1. Food that has been cooked and then cooled may need to be reheated.

2. Reheat foods ONLY when it is still while quality and suited for human consumption.

3. Reheating should be done quickly at 70°C and above. Stir the food during reheating process to make sure that all parts of the food are heated.

4. Reheating may increase the acceptability and palatability of food.

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**FIFO Method: First In, First Out**

**Food Handlers as Source of Foodborne Pathogens**

- Saliva from respiratory tract via coughing and/or sneezing
- Open cuts, sores & boils, via hands
- Infected eyes, ears; transient skin microbes
- Intestinal tract via hands contaminated with feces

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Regular hand washing with soap can reduce the rates of diarrhea by 47% to 32% and respiratory illness by 30%.
Key Point 5
Good personal hygiene practices and cleanliness can keep contamination out.

Components of Good Personal Hygiene Practice

1. Maintaining personal cleanliness
Regular bathing, regular tooth brushing, clean and adequately trimmed finger nails, clean and washed clothing, haircut, and other personal hygiene practices

2. Proper food preparation attire
Apron, hairnet, face mask, hand gloves, clean and safe foot wear, and other precautionary accessories

3. Regular handwashing practices
After using the rest room; before and after handling raw foods, touching hair, face, nose or other parts of the body; after sneezing or coughing, touching apron or clothing; and touching unsanitized surfaces or equipment.

Serve Your Food Safely

Handle food items with caution. Make it a habit to use food tongs or serving gears when serving food.

Serve and hold glasses properly. Avoid touching or carrying the glass by its lip.

Use a serving tray or a dinner plate as an under liner for glasses when serving beverages.

Use appropriate utensils when serving ice and other food items. Do not use your bare hands when handling food.
Tips for Glove Use:
Change Gloves:
- As soon as they become soiled or torn
- Before beginning a different task
- If it was used to handle potentially contaminated equipment or food item
- At least every 4 hours after continuous use

Reminder
Food undergoes a long path before it reaches our plate and it can lose its nutrient contents or become contaminated along the process. For example, improper and unclean storage facilities, as well as unsanitary practices of food handlers may cause contamination during storage or transfer from farm to market to our households. Even the act of washing and cooking food may also be a cause of food borne illnesses if the water used is contaminated. Hence, food safety must be ensured during production (gardening), procurement, storage, and preparation.

Food Production/Gardening
- Grow your own vegetables and crops using organic materials and methods.
- Use clean water. If it is unavoidable to use sewage water in gardening, filter it through sand before using on plants and ensure that harvest will be washed thoroughly before food preparation.
- Ensure that compost added to the plants is well-decomposed.

Procurement
- Choose only fresh fruits, vegetables, and meat products.
- Minimize the use of processed foods, which may contain preservatives and may have been made using stale ingredients.
- Buy from only reliable sources or dealers.

Storage
- Avoid storing nuts, corn, and beans in high temperature areas to prevent increase of bacteria population.
- Use clean and appropriately covered food storage containers. As much as possible, avoid using plastic wrappers.
- Keep hot foods hot by using hot holding cabinets; keep cold foods cold by storing them in refrigerators and freezers.

Preparation
- Thoroughly wash fruits and vegetables before storing as bacteria may come from the soil or dirty containers.
- Avoid using too much flavorings such as salt and MSG to prevent diseases of the heart and digestive system.
- Maintain personal cleanliness and of the food preparation area and utensils, dispose garbage properly.
- Wash hands regularly.
- Cook meat thoroughly.
Sample Picture Activity

1. Look at the picture carefully and cite six (6) “don’ts in food preparation”.
2. Describe how malpractices shown in the picture can cause food borne illness.
3. Cite a hazard involved in a certain food safety malpractice.
4. Cite the “Don’ts” in food preparation

Don’ts in Food Preparation

“Everybody has a role to play in keeping food safe. Food Safety is a shared responsibility between governments, industry, producers, academia, and consumers. Everyone has a role to play. Achieving food safety is a multi-sectoral effort requiring expertise from a range of different disciplines – toxicology, microbiology, parasitology, nutrition, health economics, and human and veterinary medicine. Local communities, women’s groups and school education also play an important role.”

References:
http://www.fao.org/docrep/008/a0104e/a0104e08.htm
Five Keys to food Safety Manual, Department of Food Safety, Zoonoses and Foodborne Diseases, WHO 2006
http://www.foodsafety.gov/
Ian Curt Sarmiento, Food Service System - 1, School of Nutrition, Philippine Women’s University-Manila, 2013
Introduction to Food Service, 11th Ed. Payne-Palacio et. Al. ,2009
Pinggang Pinoy, Food and Nutrition Research Institute, Department of Science and Technology, 2016