

PENANG SANGAM HIGH SCHOOL
P.O.BOX 44, RAKIRAKI
LESSON NOTES WEEK 12

Subject: Home Economics

Year/Level: 12

Strand	Food and Nutrition
Sub Strand	Food Preservation
Content Learning Outcome	1. Investigate the types and principles of preserving.

Food Preservation

- **Food preservation** usually involves preventing the growth of bacteria, fungi (such as yeasts), or other micro-organisms (although some methods work by introducing benign bacteria or fungi to the food), as well as retarding the oxidation of fats that cause rancidity.
- Food preservation may also include processes that inhibit visual deterioration, such as the enzymatic browning reaction in apples after they are cut during food preparation.

Reason for preserving food:

- To save money. Most homes – preserved food is cheaper.
- To use up food such as garden produce when it is plentiful and so avoids wastage.
- To have seasonal produce available throughout the year.
- To introduce flavor and variety to a menu as with jams and chutneys.
- For convenience; preserved foods can easily store until required.
- Preserved foods are easier to handle, distribute and transport on a large scale than fresh fruits.

Principles of Preservation

- Preserving interrupts the process of decay in food by inhibiting or preventing decomposition.
- It prevents the action of enzymes which speed up decays.
- It prevents the growth of micro – organisms.

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- It prevents the re – entry of micro – organisms by thorough sealing.
- The color, flavor, texture and nutritive value should be kept as near as to that of fresh food.

Types of Commercial Food Preservations and the Process Involved

- Food may be preserved by:
 - Removing warmth----- freezing
 - Removing moisture---- drying
 - Removing air-----canning/ bottling
- 1. **Canning** is a process of applying heat to food that is sealed in a jar in order to destroy any microorganisms that can cause food spoilage.
 - Proper canning techniques stop this spoilage by heating the food for a specific period of time and killing this unwanted micro – organisms.
 - During the canning process air is driven from the jar and a vacuum is formed as the jar cools and seals. For example, Fish and meat.
- 2. **Bottling** is done using the similar method as canning. Two methods are used in bottling. These are water bath bottling or canning and pressure bottling or canning.
 - i. **Water-bath canning**: This method sometimes referred to as hot water canning, uses a large kettle of boiling water.
 - Filled jars are submerged in the water and heated to an internal temperature of 212 degrees for a specific period of time.
 - Use this method for processing high-acid foods, such as fruit, items made from fruit, pickles, pickled food, and tomatoes.
 - ii. **Pressure canning**: uses a large kettle that produces steam in a locked compartment.
 - The filled jars in the kettle reach an internal temperature of 240° under a specific pressure (stated in pounds) that's measured with a dial gauge or weighted gauge on the pressure-canner cover.

-Use a pressure canner for processing vegetables and other low-acid foods, such as meat, poultry and fish.

3. **Freezing**

- Freezing foods is the art of preparing, packaging, and freezing foods at their peak of freshness.
- You can freeze most fresh vegetables and fruits, meats and fish, breads and cakes, and clear soups and casseroles.
- The keys to freezing food are to make sure it's absolutely fresh, that you freeze it as quickly as possible, and that you keep it at a proper frozen temperature (0 degrees).
- Properly packaging food in freezer paper or freezer containers prevents any deterioration in its quality.
- Damage occurs when your food comes in contact with the dry air of a freezer.

What is freezer burns: Freezer burn is a condition that occurs when frozen food has been damaged by dehydration and oxidation, due to air reaching the food. It is generally caused by food not being securely wrapped in air-tight packaging.

How to reduce freezer burns

- (i) Reduce exposure to air: Wrap food tightly.
- (ii) Avoid fluctuating temperatures: Keep the freezer closed as much as possible. Know what you want to remove before opening the door.
- (iii) Don't overfill your freezer: An overly full freezer reduces air circulation and speeds freezer damage.

4. **Dehydration**

- Drying is the oldest method known for preserving food. When you dry food, you expose the food to a temperature that's high enough to remove the moisture but low enough that it doesn't cook.
- Good air circulation assists in evenly drying the food. An electric dehydrator is the best and most efficient unit for drying, or dehydrating, food.
- You can also dry food in your oven or by using the heat of the

sun, but the process will take longer and produce inferior results to food dried in a dehydrator.

5. **Cold Storage** – food storage at low temperature

- Storage at low temperatures prolongs the shelf life of many foods. In general, low temperatures reduce the growth rates of microorganisms and slow many of the physical and chemical reactions that occur in foods. For example: Fish
- Once fish is frozen, it must be stored at a constant temperature of -23°C (-10°F) or below in order to maintain a long shelf life and ensure quality.
- A large portion of fresh fish is water (e.g., oysters are more than 80 percent water). Because the water in fish contains many dissolved substances, it does not uniformly freeze at the freezing point of pure water.

6. **Irradiation**

- Ionizing radiation can kill micro – organisms, so it can be used to preserve food.
- When food is irradiated, energy passes through and kills harmful bacteria.
- The energy is similar to ultraviolet light.
- It does not make the food radioactive.

Two levels of radiation are used:

- (i) Low dose – will stop vegetables like potatoes from sprouting; prevents insect damage to cereals, pulses, spices, etc.; destroy parasites (like tapeworms in pigs); delays the ripening of fruits (e.g. bananas and mangoes); and allows longer storage of foods such as shellfish and strawberries.
 - (ii) Medium dose – will kill most spoilage and harmful bacteria, molds and yeast and will enhance the storage of some foods.
- There is a concern that some nutrients may be lost during irradiation; although the food may look fresh, chemical and enzyme changes may continue, so the consumer may be buying an inferior product.

7. **Use of Antibiotics**

- Antibiotics are used to treat infections caused by bacteria.
- Bacteria are microscopic organisms, some of which may cause illness.
- The word bacteria are the plural of bacterium.
- Such illnesses as syphilis, tuberculosis, salmonella, and some forms of meningitis are caused by bacteria.

Activity

1. Freezer burns are a common cause of food spoilage.
 - i. Explain how freezer burns occur on food.
 - ii. State one way of reducing freezer burns from occurring.
2. Given below is an illustration of a preserved product.



Source: www.gemimisjelly.com

- i. Identify the principle of preservation involved in the preservation method given.
- ii. Explain how commercial preservatives contribute to cancer.