II Let us consume nutritious food for a healthy life

Energy required for the existence of all living beings, their development and protection from diseases is provided by food. For a healthy life it is important to prepare meals with high nutritional value and also to ensure that food does not cause any danger or harm to the body.

Over the past several years you would have learnt many facts regarding the nutrients in food, nutritional problems and how to minimize these problems.

In this lesson you will learn about food safety, food spoilage, adulteration of food, food poisoning and how to protect the nutritional value of food and select food items suitable for consumption.

Food safety

Food safety is a scientific discipline describing handling, preparation and storage of food, in ways that prevent contamination and food-born illness.

Factors that affect food safety

1.Biological factors

Micro organisms present in food that are harmful to the body, belong to this category. eg : bacteria, fungi

Micro organisms spoil food and emit toxins, which are usually harmful to man.

2.Chemical factors

These include residual chemical substances added to food at various stages.

eg: Prior to harvesting – pesticides After harvesting – chemical substances added to ripen food and for food preservation If vegetables and fruits are not washed well prior to consumption residual agro chemicals may enter the body. Long term deposition of such substances may give rise to diseases like cancers and kidney diseases.

The Ministry of Agriculture recommends that the harvest should not be gathered until two to three weeks have passed since the last use of agrochemicals.

3.Physical factors

These include substances such as stones and sand, which can contaminate food during transport, storage and preparation.

Numerous diseases can occur due to one or more factors related to food safety.

eg: spoilt food can give rise to vomiting and diarrhoea

Instances where action should be taken to ensure food safety

1. Manufacture of food

Within the farm land:

- Adding pesticides according to recommended standards
- Use of natural pest control methods (eg Margosa juice)



Figure 11.1 - Ensuring food safety within farmland

- Use of organic fertilizer
- Ensuring cleanliness of farming equipment and farmland

Within the factory:

- Ensuring cleanliness of raw ingredients
- Ensuring cleanliness of the manufacturing environment
- Ensuring cleanliness of the equipment used in the manufacturing process and the interior of the factory
- Maintaining personal hygiene of staff members

The use of recommended artificial flavours and dyes in recommended quantities during manufacture



Figure 11.2 - Ensuring food safety within factories

2. Transport of food

- Use of wooden boxes and plastic baskets • to prevent bruises and scratches
- Avoid stacking boxes one on top of the other beyond the available space.
- Use appropriate temperature settings to suit the food items. Eg: milk products should be transported maintaining the ideal temperature
- Use covers to prevent contamination.
- Use natural protective measures as much Figure 11.3 Transport ensuring food as possible instead of artificial chemicals to prevent food spoilage during transport.



safety

3. Storage of food

- Arrange items on the shelf according to their date of expiry and place the items with early dates of expiration in front.
- Use measures to prevent damage by insects and other animals such as rats, cockroaches, weevils and termites.
- Maintain the appropriate temperature within the stores according to the relevant food items.
- Correct use of refrigerators and deep freezers.
 - Food items should be stored in appropriate locations in the fridge

- ► Food that requires refrigeration or deep freezing should be kept at the required temperature throughout 24 hours. The refrigerator should not be switched off during the night.
- ► Food and beverages should not be stored together with substances such as toxic materials, medication, aromatics etc.
- ► Meat, fish and ice cream should not be stored together



- 1. Meat and fish which require deep freezing
- 2. Butter, margarine
- 3. Vegetables
- 4. Bottles

Figure 11.4 – The manner in which food should be stored in a fridge at home

4. Preparation of food



Figure 11.5 - Preparing food ensuring safety

- Avoid using food which has been damaged or consumed by animals
- Avoid using spoilt or mouldy food
- Keep pets away from the area in which food is prepared
- Wash hands well before preparing food
- Clean green leafy vegetables well, soak in salt water for some time and then use
- Scrub and wash the outer skin of fruits well

- Wash eggs before breaking them as the shell may carry bacteria eg : salmonella
- Cut fruits and vegetables just before cooking (to prevent browning and loss of vitamins)
- Avoid repeated reuse of oil for frying food
- Use clean bowls and correct methods of cooking eg: keep the lid open when boiling Manioc

5. Consumption of food

- Keep food covered until consumption
- Avoid use of metal, using clay or glass bowls and wooden or plastic spoons to serve food containing vinegar, as vinegar which contains acid will react with metal and form harmful substances.
- Avoid consumption of food such as potatoes which have become green in colour and manioc which has been exposed to air
- Avoid use of bruised or swollen tinned or packet food



Figure 11.6 - Covering food

Food Spoilage

Food spoilage is the presence of any substance in food, which make it unsuitable for consumption.

Causes of food spoilage

1. Action of micro-organisms

eg: mould growing on food

- 2. Action of other animals
 - eg: rats consuming part of the food
- 3.Interactions between food and environment
 - eg: browning, oil rancidity

Ways of recognizing spoilt food

- 1. Foul smell
- 2. Change in colour
- 3. Change in texture
- 4. Change in taste

Negative outcomes of food spoilage

- 1. Increase in incidence of disease eg: vomiting, diarrhoea
- 2. Wastage of food
- 3. Economic loss
 - eg: reduction in income due to loss of crops
- 4. Reduction in quality of food
 - eg: reduced nutritional value in food due to change in chemical composition of proteins and other elements following their breakdown.

主 え Activity

Observe the following food items after they have been kept outside for several days and they have become spoilt. Describe your findings on how their colour, texture, shape and smell have changed.

- 1. Carrots
- 2.Papaw
- 3. Potatoes
- 4.Bread
- 5.Rice
- 6.Plantains

Food Adulteration

Food adulteration is any means by which the quality of food is reduced.

Food adulteration is done in many ways. Several examples are given below.

Addition of numerous chemicals to food

- ► Addition of papaw seeds to pepper
- ► Addition of melamine to milk powder
- ► Addition of artificial dyes to tea leaves
- Addition of wheat flour, rice flour, corn flour, brick powder, rice chaff, cattle feed and wood shavings to adulterate chili powder, saffron and pepper
- ► Addition of manioc flour to adulterate corn flour

Problems arising due to food adulteration

1. Negative impact on health

Use of adulterated food can give rise to diseases as well as discomfort. eg: Tartrazine, which is added to cordials, can cause poor sleep at night.

2. Loss of nutrients

Reduction in the amount of nutrients received due to addition of other substances to food.

eg: The nutritional requirement which one expects to fulfil by drinking a glass of milk, cannot be achieved when milk is adulterated with water. Iodine deficiencies occur when non-iodized salt is labelled as iodized salt and sold in the market.

3. Economic losses

There is a drop in sales when people suspect adulteration and avoid consuming food from these places. Losses can occur even due to legal action and banning of products. Furthermore as people contract diseases due to food adulteration the expenses borne by the government for medication and health services increase.

主文 Activity

Make a list of methods used in adulteration of different food groups including vegetables, fruits, condiments, milk, fish and meat.

Methods of identifying adulterated food

Chemical and physical methods are used to identify food adulteration.

According to the colour, shape, smell and texture the adulterant can be identified.

Simple methods in identifying food adulteration are mentioned below.

- Sieve (filter) shards of glass, pieces of iron, metal, plastic, wood, stones, sand, cigarette butts can be separated and identified by this method. In a similar manner different parts of plants and insects such as cockroaches and weevils can be separated from food.
- 2. Smell a strong malodour is emitted when a chemical such as formalin is added.
 There is a difference in smell between coffee which is unadulterated and which is mixed with flour.
- 3. Shape / colour When formalin is added to fish its red colour gives way to a more pale appearance.

Food Poisoning

Food poisoning is defined as the occurrence of an illness due to a toxic substance in food entering the body with food or water.

It can cause the following clinical features, which include abdominal pain, dizziness, vomiting, diarrhoea and fever.

Food poisoning occurs due to substances naturally found in food, as well as due to other substances incorporated into food during cultivation, manufacture and preparation.

Instances where toxic substances get incorporated into food

- 1. Food which contains naturally occurring chemicals toxins eg: cassava, cabbage, some green leafy vegetables
- 2. Toxic substances which arise due to environmental factors eg: potatoes when exposed to sunlight produce a toxic substance called solanine and turn green in colour
- 3. Toxins produced by micro-organisms that grow on food eg: black mould which grows on peanuts
- 4. Insecticides and pesticides used in cultivation becoming toxic

5. Toxic substances produced during cooking

eg: When pickles are prepared in aluminium dishes the dilute acetic acid in vinegar dissolves the aluminium and produces toxic substances. When coffee, meat and potato slices are charred toxic substances and a bitter taste will be produced.

Reuse of the same oil repeatedly for frying can produce harmful chemicals.



Figure 11.7 - Occasions when poisons enter food

Causes of food poisoning

1. Micro-organisms such as bacteria and viruses

2. Toxins

Chemical substances released by bacteria during their metabolic activities are known as toxins. They could be present in food and cause food poisoning.

Cooking at an adequate temperature will destroy toxic bacteria as well as the toxins produced by them. Heating for 1-2 minutes is sufficient to destroy the toxic bacteria. However to destroy their toxins the food must be cooked at a temperature exceeding 60 °C for approximately 30 minutes.

3. Chemicals

All food items are made of chemical constituents and our bodies also contain numerous chemicals. However, the chemicals, which give rise to food poisoning, do not naturally occur in those foods. These chemicals may have been included due to accidental contamination or as an additive to obtain the required taste, smell or colour or as a preservative.

Soaking in water helps to remove the natural toxins of cassava and soy-beans.

Food Allergies

Consumption of some food items can give rise to clinical features such as itching, urticarial rash, vomiting and faintishness. If this occurs as an abnormal reaction mounted by the body's immune system against that food item, it is known as a food allergy. Symptoms of allergy can occur with the consumption of any type of food. The same food item will affect different people in a different manner. A food item which causes an allergy in one person, may not do so in another.

Causes of food allergies

1. Special ingredients in food

The constituents of some food either acting directly or by stimulating other reactions in the body can give rise to clinical features.

eg: wine, cheese, yeast extract

2. Chemicals which are added for food preservation

The body gives rise to numerous reactions against these chemical substances. eg: sulphur dioxide and sulphide

3. Difficulty in digesting some food substances

Some individuals suffer from lactose intolerance. The ease with which infants and young children digest milk products is lost in adulthood.

Clinical features of allergies

- Itching
- Urticarial rash
- Warmth at the site of allergy
- Red eyes
- Running nose

As this condition can be fatal it is important to identify food that can cause allergies early on and avoid their use, as well as obtaining medical advice when necessary.



Figure 11.8 - Rash

Food that commonly cause allergies

Milk

Tree Nuts

- Peanuts
- Prawns, crabs
- Milk
- Types of fish
- Eggs
- Chocolate
- Pork, bacon
- Preservatives and dyes
- Gluten proteins (corn, rye, barley)
- Tomatoes
- Pineapple

Steps to be taken to prevent allergies

• Always check the food labels to identify any substances that you may be allergic to (especially with regard to packet, tin and pre-prepared food).

Shellfish

Peanut

Figure 11.9

- When consuming food from outside find out for certain if any allergens have been used in preparation.
- If you have suffered from a serious allergic reaction always wear an allergy bracelet or keep with you a document indicating the allergy.
- When obtaining medication from a doctor disclose any previous allergies especially prior to receiving vaccines.
- Inform all family members regarding any allergies that a family member has so that they can inform a doctor in an emergency.
- If a child suffers from allergies his or her carers, teachers, parents of friends and any adults who are in regular close contact should be informed of this. They should also be informed of the steps witch need to be taken during an allergic reaction.

Wheat

Egg

Sov

Let us protect the nutritional value of food

The nutritional value must be preserved to obtain the nutrients that are necessary for the body and to prevent nutritional deficiencies.

Nutrients may be destroyed in several ways during the process from food manufacture to consumption. Therefore it is necessary to take steps to improve and protect the nutritional value of food.

主文 Activity

Complete the following table with methods of protecting and enhancing the nutritional value of food during food preparation after discussing with adults.

Methods to protect the nutritional value	Methods to improve the nutritional value

To protect the nutritional value of food attempt to do the following

- When preparing green leafy vegetables first prepare the onions and coconut and then add the freshly cut green leafy vegetables. Then cook on a low heat for a short period so that the leaves do not discolour. This will help to preserve the nutritional value.
- Cooking meals in the shortest possible time will protect the colour, nutrient value and taste. Pressure cookers and microwave ovens can be used for this purpose.
- As calcium can reduce iron absorption, avoid cooking foods rich in calcium and iron together.
- Obtain different nutrients in the same meal by cooking several types of food together

eg: add leaves of drumsticks when cooking rice mixed green leaf salad hath maluwa soups



Figure 11.10 -Varieties of soup

- Add condiments to improve the taste and give a medicinal value to the meal
- Additional nutrients can be obtained by using fortified food eg: Iodized salt

Vitamin A fortified oil

- To fulfil the amino acid requirement consume pulses and grains together.
- Increase iron absorption by adding lime to food. Add lime juice to a cooked meal once it cools down. If not the heat will destroy vitamin C in lime juice.
- To increase the iron content in the food, add Maldives fish.

主文 Activity

Gather information about the medicinal properties of cinnamon, garlic, ginger and saffron, which are condiments used to improve the flavour of food and make a small booklet.



Let us consume food suitable for a healthy life

Food is an essential requirement for the existence of all living being. To lead a healthy life free of communicable and non-communicable diseases, it is important to select suitable food.

Many types of food are found in the market

Natural food



Figure 11.11

Natural food includes food that has had minimal preparation to preserve its natural quality. They do not contain artificial flavours, dyes or aromatics and are healthier than pre prepared food. Natural food contains a lot of antioxidants and therefore helps to protect from diseases such as cancer. In addition they contain a large amount of fibre. Even natural food can have an less favourable effect on the body in instances such as cutting vegetables long before cooking and use of chemical fertilizers in place of organic fertilizers.

Processed food



Processed food includes food that has been prepared in a manner easy to use or to increase shelf life. Additives are commonly used for flavour, colour and aroma. These food have high calorie content and less fibre. Therefore by consuming these food the risk of contracting diseases increases.

Fast food and Junk food



Food that is made in a manner that enables it to be prepared for consumption over a short period of time is known as instant food. These can be seen in several forms.

Dried food

Food that can be consumed after adding water. eg: tea, coffee, milk powder, soups

 Food that can be consumed after adding other ingredients and a short cooking process.
 eg: noodles

Some types of fast food are suitable according to health standards while others are not. Therefore it is important to be vigilant about the ingredients of these food items when selecting them.

Food, which is high in energy, sugar and oil content and low in other nutrients, are unhealthy and are defined as junk food.

Therefore even though fast food has the advantage of saving time and provides ease in cooking you must be intelligent enough to avoid what is unhealthy among these food and select only healthy food.



Categorize the food available in the market or cafeteria according to the above mentioned categories.

Summary

For a healthy life it is important to select nutritious food and consume it in a manner which ensures food safety.

Therefore you must be vigilant about food safety.

Physical, chemical and biological factors affect food safety.

We must pay attention to food safety during the stages of manufacture, transport, storage and consumption.

Food spoilage, adulteration, food poisoning and food allergies can be a threat to health during food consumption.

Different methods can be used to protect and improve the nutritional value of food.



- 1. What is food safety?
- 2. Name the factors that affect food safety and give one example each.
- 3. What are the instances where you must be cautious about food safety?
- 4. Describe three steps that must be taken to ensure food safety during storage.
- 5. Describe five facts that must be taken into account to ensure food safety during preparation of food.
- 6. Write three adverse outcomes of food spoilage.
- 7. Describe three methods of identifying food adulteration.
- 8. Name three factors that affect food poisoning.
- 9. Describe five steps that you can take to prevent food allergies
- 10. Describe five steps that can be taken to protect and improve the nutritional value of food.