PROTOTYPE

NCDC
NATIONAL CURRICULUM DEVELOPMENT CENTRE

NUTRITION & FOOD TECHNOLOGY

TEXTBOOK

SENIOR ONE

LOWER SECONDARY CURRICULUM

NCDC
NATIONAL CURRICULUM DEVELOPMENT CENTRE

NUTRITION & FOOD TECHNOLOGY

TEXTBOOK

SENIOR ONE

LOWER SECONDARY CURRICULUM

Published 2020

This material has been developed as a prototype for implementation of the revised Lower Secondary Curriculum and as a support for other textbook development interests.

National Curriculum Development Centre
P.O. Box 7002,
Kampala- Uganda
www.ncdc.co.ug

Table of Contents

Preface

This Learner's Book has been written in line with the revised Nutrition and Food Technology Syllabus. The knowledge and skills which have been incorporated are what is partly required to produce a learner who has the competences that are required in the 21st century.

This has been done by providing a range of activities which will be conducted both within and outside the classroom setting. The learner is expected to be able to work as an individual, in pairs and groups according to the nature of the activities.

The teacher, as the facilitator, will prepare what the learners are to learn and this Learner's Book is one of the materials to be used to support the teaching and learning process.

Associate Professor Betty Ezati

Chairperson, NCDC Governing Council

Acknowledgements

National Curriculum Development Centre (NCDC) would like to express its appreciation to all those who worked tirelessly towards the production of this Learner's Book.

Our gratitude goes to the various institutions which provided staff who worked as a panel, the Subject Specialist who initiated the work and the Production Unit at NCDC which ensured that the work produced meets the required standards. Our thanks go to ***Enabel*** which provided technical support in textbook development.

The Centre is indebted to the learners and teachers who worked with NCDC Specialist and consultants from Cambridge Education and Curriculum Foundation.

Last but not least, NCDC would like to acknowledge all those behind the scenes who formed part of the team that worked hard to finalise the work on this Learner's Book.

NCDC takes responsibility for any shortcomings that might be identified in this publication and welcomes suggestions for effectively addressing the inadequacies. Such comments and suggestions may be communicated to NCDC through P.O. Box 7002 Kampala or email: admin@ncdc.go.ug.

Grace K. Baguma

Director, National Curriculum Development Centre

About this Book

Welcome to the world of Nutrition and Food Technology. This book is especially written for the learners of Nutrition and Food Technology in Senior One. In this subject, you will acquire skills that will enable you to fight the challenges of malnutrition which are rampant in the community. You will appreciate the importance of living healthily through ensuring healthy diets and maintaining a high standard of personal, food and kitchen hygiene.

The book also provides you with an opportunity as a learner of Nutrition and Food Technology to acquire skills in food processing and preservation. In a country where there is plenty of fresh food, it is unfortunate that there is so much waste at certain periods when there is plenty and yet so much lack during periods of scarcity when the food is out of season. Food technological skills will therefore enable you to preserve food when it is in plenty and to make it available when it is out of season. With these, you can be sure of acquiring employable skills to earn a living.

The topics covered throughout Senior One are Introduction to nutrition and food technology, kitchen equipment, safety in the home, proteins, carbohydrates, mineral salts and vegetable processing.

Nutrition and Food Technology is related to other subjects like Agriculture that provides the basis of food; Biology that brings out the science of food, and Fine Art that brings out the art of food. For example, it uses art to promote eating healthy foods and healthy living.

CHAPTER 1:

Introduction to Nutrition and Food Technology

Key Words

- Nutrition
- Food technology
- Food
- Nutrients
- Malnutrition
- Over nutrition
- Under nutrition
- Diet
- Meal
- Food processing
- Food preservation
- Refuse

Learning Outcomes

By the end of this chapter, you will be able to:

a) explain the terms used in Nutrition and Food Technology and value the importance of healthy living.
b) value the feeding habits and practices of different cultures.
c) explain the factors that influence feeding habits and practices of people.
d) practise personal hygiene.
e) use the different types of cleaning agents correctly.
f) clean different areas of food handling in the home.
g) control household pests.
h) practise personal, food and kitchen hygiene during meal preparation.
i) appropriately dispose of different types of household refuse.
j) make a compost pit. work in a clean place.

Your body is like a machine that needs good materials to be able to perform its functions well. These materials are provided by the food you eat. The food you eat is influenced by the

feeding habits. These feeding habits and practices vary from family to family, but also from culture to culture. You should make sure that food is always provided in the right amounts. It is also important to remember that food should be prepared under clean conditions to promote healthy living.

Nutrition and Food Technology will teach you how to make healthy, well-balanced meals safely and hygienically. You will require these skills now and later in life to stay fit and healthy. Food Technology will also teach you about the development of new food products that could be manufactured and sold to other people to consume. You will use the skills acquired to design creative and original food products.

Meaning of Terms used in Nutrition and Food Technology

Different terms are used and applied in Nutrition and Food Technology.

Activity 1.1: Explaining the following terms as used in Nutrition and Food Technology

i) Delicacy
ii) Diet
iii) Food
iv) Food preservation
v) Food processing
vi) Food technology
vii) Hygiene
viii) Malnutrition
ix) Meal
x) Nutrients
xi) Nutrition
xii) Over-nutrition
xiii) Under-nutrition

What is a nutrient?

You can define a nutrient as anything that provides nourishment essential for the maintenance of life and for growth. In your primary education, you learnt about nutrients. Can you mention the six specific categories of nutrients? You need all of them to sustain life. These are: carbohydrates, proteins, fats, vitamins, minerals and water.

How best would you group nutrients?

One way of doing this is by grouping them according to the amount required by the body. In this case you will have two groups: micronutrients and macronutrients. Water is usually left alone because it does not contain any food value, but it enables the body to use the other nutrients.

Carbohydrates, proteins and fats are called macronutrients because they are needed in large amounts. Carbohydrates and fats are energy nutrients because they provide the fuel your body needs to do things. Proteins, on the other hand, are body builders. They help your body to develop and grow.

Vitamins and minerals are called micronutrients. They are required in much smaller amounts. That doesn't mean they are less important. They are all essential nutrients, but you only need little bits of them.

When your body does not get adequate amounts of each, or any of the above nutrients, it will not function well. Have you ever heard of the word malnutrition? It is a nutritional condition that occurs when a person takes in more than or less than the quantity of nutrients needed by the body. When your body does not get enough nutrients, the condition is called undernutrition. On the other hand, when your body gets more than is needed, it is called overnutrition. Undernutrition is most often a result of not taking in enough high-quality food.

How do you ensure good nutrition?

Eating the correct amounts of the right kinds of food provides the body with good nutrition. To know the right kinds of food, you must learn about nutrients and their functions in the body. The illustrations below show two different pictures of children who have been feeding on different diets.

Activity 1.2: Identifying the features of a malnourished child

Figure 1.1: A healthy child

Figure 2: Malnourished child

Look at figures 1 and 2 above. Copy and complete the table below in your exercise book using the following descriptions that best describe the children in each picture.

i) A happy face
ii) Thin arms and legs
iii) Bright eyes
iv) Low weight for the age
v) No energy to play
vi) A thin body
vii) A face miserably unhappy
viii) Smooth skin
ix) Sad face
x) Dull eyes
xi) A well-built body
xii) Saddening to look at

Table 1.1: Features of the two pictures above of a healthy child and a malnourished one

Picture 1	**Picture 2**

Which of the pictures above shows a child who is feeding well?

Causes of malnutrition

Malnutrition is a common health problem. Several factors are responsible for causing this anomaly. You will realise that malnutrition is a common challenge among people of different ages, both children and adults.

Figure 1.3: Malnourished people

Activity 1.3: Stating the causes of malnutrition

What do you think causes a person to become malnourished?

Effects of malnutrition

You should give serious consideration to the effects of malnutrition because they take a long time to be visible. Their effects may also cause long-lasting damage which may not easily be reversible. Malnutrition results in poor brain development and inability to work well. It also results in poor resistance to disease and malformed bodies. You should remember that most nutrients work together in order to perform their functions. This is why it is important to take a balanced diet.

Effects of malnutrition are more pronounced in children below 5 years of age, adolescents and mothers (pregnant and breastfeeding). One of the ways you can determine whether a child has malnutrition or not is by taking regular measurements for weight and height. You can then compare them with those of a normal child using normal graphs on growth monitoring charts.

Activity 1.4: Understanding the effects of malnutrition

i) Why do you think the effects of malnutrition are more pronounced in some groups of people?

ii) Make a visit to a health centre or an immunization centre and study the growth charts of the children who have been brought in for examination.

iii) See how many are growing normally and how many have problems.

How you can prevent malnutrition in your community

Look around your community. Do you see any cases of malnutrition? It is your duty as an individual to always ensure that you prevent malnutrition in your life, your family and your community.

How can you encourage the consumption of protein foods, fruits and vegetables besides the carbohydrates in your home and community to ensure a balanced diet?

Do you know that eating plenty of vegetables is very important for healthy living for all groups of people? Vegetables are readily available. How can you encourage family and community members to eat vegetables? Make a decorative item to be placed in your home as a reminder of the consumption of vegetables.

Activity 1.5: Preventing malnutrition

In groups, describe different ways of preventing malnutrition in your community.

Project

Make a home decoration item with vegetables, fruits or protein foods to be displayed in your home. Skills used may be hand-stitching, drawing, painting and collage, among others.

Feeding Habits and Practices of different Cultures in Uganda

Have you ever thought about what or who determines what you eat? You must have realized that many of your friends enjoy eating different foods. What your family enjoys eating is most likely to be different from what another family enjoys.

This also happens to different tribes and different cultures. We value different foods that we take as delicacies. The change occurs from culture to culture and may even change from age group to age group.

Figure 1.4: Traditional and cultural foods in some parts of Uganda

The food you eat is part of the traditions and culture of your family. Eating has an emotional part as well. When you feel a certain way, you reach for foods you would not normally eat.

Figure 1.5: Following your emotions to eat

Sometimes we seem to be feeding our feelings rather than our bodies. Many eating behaviours are motivated by emotions that we are not aware of.

For many people, changing eating habits is very hard. You may have had certain eating habits for so long that you even fail to realize that they are actually unhealthy. They become part of your daily life that you do not even think about them.

Activity 1.6: Discussing feeding habits

In groups, talk about the feeding habits and practices in your:

i) family
ii) culture
iii) age group

Factors that influence food habits and practices

Your food habits may be influenced by different factors. These include:

i) Presence of food
ii) Nutritional knowledge
iii) Money available to buy the food
iv) Addiction to drugs and alcohol
v) Environment
vi) Climate of the region
vii) Individual preferences

Hygiene

What comes to your mind when you hear the word hygiene? You can define hygiene as the practice of keeping yourself and your environment clean in order to prevent illness and disease. If you are not hygienic, food can be contaminated. Contamination can be through a dirty person, contact with an unclean work surface, equipment, pests, rubbish and other food. Other foods like raw meat contain bacteria which can cause cross-contamination when it comes into contact with other foods. There is need to help individuals, families and communities to understand the link between poor hygiene and disease. You can now look at personal hygiene.

Activity 1.7: Explaining hygiene

In pairs, explain different types of hygiene to one another. Share your findings with the rest of the class. Have you ever thought of the importance of keeping yourself and the environment around you clean?

Personal hygiene

The figures below will help you to bring out different ways of maintaining personal hygiene.

Figure 1.6: Washing hands

Figure 1.7: Bathing

Figure 1.8: Brushing teeth

Figure 1.9: Washing hair

Activity 1.8: Keeping your body clean

1. In groups, describe the different ways of keeping the different parts of your body clean.
2. In teams of 5, discuss and do/or role-play the following activities:
   i) Brushing teeth, gums, tongue, lips
   ii) Trimming nails
   iii) Cleaning hair
   iv) Action of shaving
   v) Action of bathing
   vi) Use of deodorants & alternative herbs
   vii) Washing pants, hankies, stockings
   viii) Polishing/cleaning your school shoes

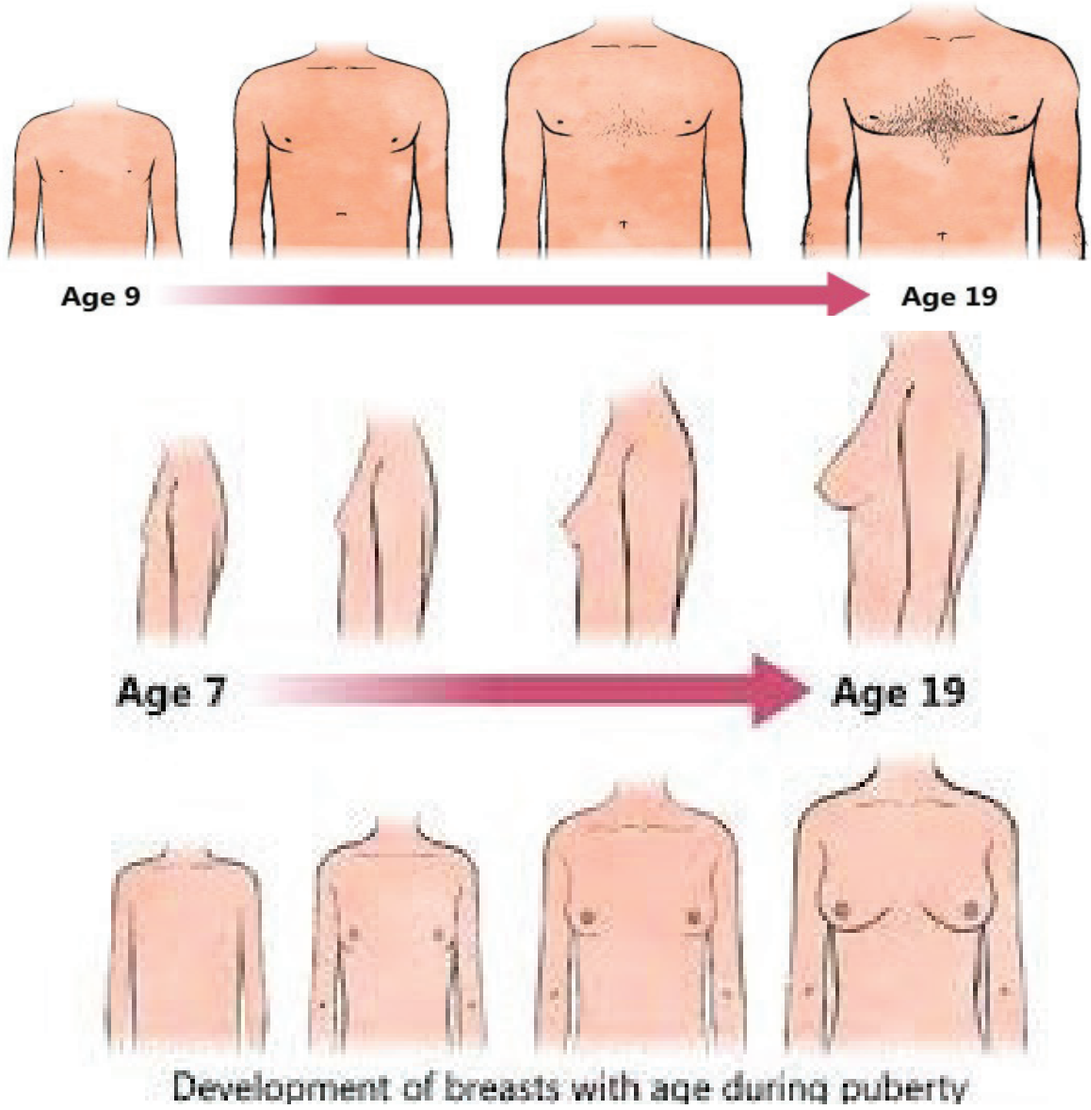


Figure 1.10: Development of body parts

As you grow from childhood to adolescence, your body keeps changing. In a girl, for example, the breasts develop and become larger. Then there is the onset of menstruation. The hips also become large and there is growth of pubic hair. In boys, the voice becomes deeper and the shoulders become wider. During puberty, boys also start experiencing wet dreams. Undergoing menstruation and wet dreams calls for a high level of hygiene.

Activity 1.9: Understanding body changes during growth and development

i) Apart from the ones mentioned above, can you name other body changes that occur as a result of growth and development?
ii) In groups of 20, discuss and illustrate how you use menstruation sanitary towels or their alternatives?
iii) Also discuss how you should bath and clean your pants during menstruation, and after experiencing wet dreams.
iv) In groups of 10, let each of you make a sanitary towel and an alternative (e.g., pieces from cotton sheets) as a group project. Work from locally/readily materials.

All these changes come along with a greater need for maintaining personal hygiene.

Activity 1.10: Adapting to physical changes during adolescence

In groups, describe different ways that can help you to adapt to physical changes during adolescent, and how you can ensure that you maintain hygiene during these changes.

Food and Kitchen Hygiene

Figure 1.11: Safety in the home

Now, you have learned the importance of keeping yourself clean. It is not enough, however, just to ensure cleanliness of your body. You should also remember that it is important for you to observe hygiene when preparing food. Food and kitchen hygiene greatly determine the quality of the food we eat.

Activity 1.11: Explaining the meaning of food and kitchen hygiene

In pairs, explain the meaning of the following:

i) Food hygiene
ii) Kitchen hygiene

Points to observe in maintaining food hygiene

1. Always wash your hands before and after handling food.
2. Ensure cuts and sores are covered with plaster before handling food.
3. Keep yourself clean and put on protective clothing.
4. Never cough, sneeze, spit or smoke over food.
5. Do not lick fingers and spoons and then use them to handle food.

6. Always use tongs, folks and spoons to handle cooked foods, fruits and vegetables. You should keep your hands off food as far as possible.
7. Use clean equipment for preparing and serving food.
8. Keep food protected from flies, pests and rodents.
9. Waste food should be disposed of in the right way.
10. Make sure that all frozen foods are thawed well before cooking.
11. Prepare raw and cooked food in separate containers to prevent cross contamination.

Points to observe to maintain kitchen hygiene

1. Wash and clean work surfaces, cooking place and the floor.
2. Utensils and equipment used should be kept clean.
3. Avoid pets like dogs and cats in the kitchen.
4. Thoroughly wash the kitchen clothes and dry them well.
5. Use each type of kitchen cloth for the right purpose.
6. Wipe spills as soon as they occur.
7. Use hot water, a good detergent for washing dishes and cleaning the kitchen to remove all traces of food.
8. Disinfect the rubbish bins and the washing areas regularly.

Activity 1.12: Cleaning up the kitchen

i) In groups of 2, wash, rinse, boil and dry kitchen cloth.
ii) Also clean a working table and floor before washing the cleaning clothes and mops.

Why you need to work and live in a clean environment

Serving safe food is important for good health. It should be part of every individual who prepares food. The environment in which we prepare and cook our food affects the quality of the food we eat.

Activity 1.13: Giving reasons for having a clean environment

i) In groups, give reasons why it is important to work and live in a clean environment.
ii) Why do you think there is need to maintain a high standard of hygiene during food preparation?

Food Handling

When preparing and cooking food, you will need to use different areas to get food to the table. You should always ensure that all these areas of food handling are kept clean. This will enable you to prepare safe food.

Activity 1.14: Carrying out a practical on cleaning food storage areas

In groups, clean different areas used in the storage and preparation of food. Clean the food store/refrigerator/larder, work table, cooking area/cooker, wash area/sink. Use different types of cleaning agents correctly.

It is dangerous to practise poor hygienic handling of food. It is one of the causes of a number of health hazards.

Activity 1.15: Knowing the dangers of unhygienic food handling practices

i) What do you think are the dangers of unhygienic practices in food handling?
ii) Make a poster to illustrate hygienic and unhygienic practices in the kitchen

Household Waste

To prepare healthy food, you should be able to manage household waste well. Waste can be grouped into two, that is, organic and inorganic waste. Organic waste is one which can rot. It produces a bad smell and attracts pests. Examples of organic waste are food scraps, vegetable and fruit peelings and grass, and animal and poultry droppings.

Inorganic waste, on the other hand, does not rot. It includes broken bottles, pots, tins and polythene bags. This kind of waste is difficult to dispose of, making the home untidy.

Activity 1.16: Sorting out household refuse

In groups, label different waste bins for collecting different types of refuse. Sort out the different types of refuse and place them in the correct bins.

Waste disposal

You should dispose of waste as quickly as possible. When waste is not disposed of, it produces a bad smell, attracts rats, flies, and other pests which spread germs.

Waste handling

Activity 1.17: Waste handling

In groups, discuss the different ways of disposing of household waste.

Activity 1.18: Explaining terms in refuse disposal

In your notebooks, explain the following terms as used in refuse disposal:

i) Waste
ii) Waste disposal
iii) Waste handling
iv) Waste recycling
v) Waste re-use

Activity 1.19: Categorising refuse

Categorise and show how different types of refuse are disposed of.

Control of Household Pests

Household pests can be a menace in a home. They multiply rapidly and feed on leftover food. They carry germs that cause diseases like cholera, dysentery, and typhoid fever. A high standard of cleanliness is required to control them.

Common Household Pests

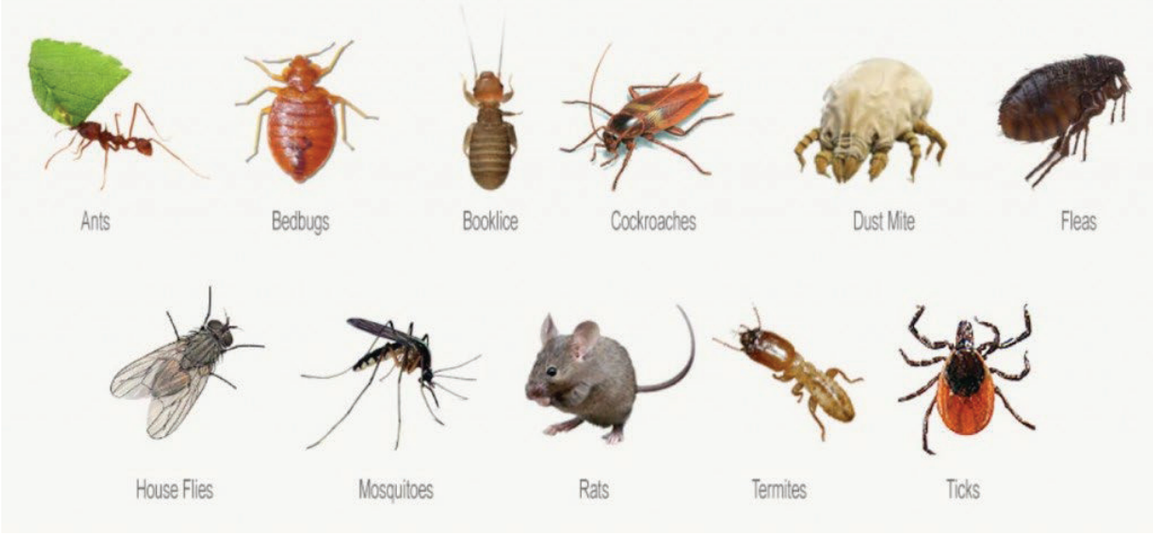


Figure 1.12: Household pests

Guidelines for controlling household pests

1. Cover all the food with a clean cover.
2. Dispose of household wastes correctly.
3. Wipe off spills on tables and floors immediately.
4. Use disinfectants when cleaning different areas in the home.
5. Store foods carefully.

Activity 1.20: Discussing household pests

In groups, carry out a discussion on the following:

i) Identifying household pests
ii) Effects on health and property
iii) Control of household pests

Activity 1.21: Carrying out a community cleaning exercise

Visit a neighbouring trading centre and carryout a cleaning exercise to demonstrate the importance of living in a clean environment.

Project: Refuse disposal

Work in groups

i) Produce items by making use of the waste in your school.
ii) Set up a waste disposal unit in your school.
iii) Write a report on your project work.

Situation of Integration: Importance of Cleaning

Context

During Zoe's graduation party, the cooks were so overwhelmed and exhausted with too much work.

They did not take care of hygiene during and after food preparation.

They also left the entire kitchen dirty with all the leftover food lying around.

All the plates, dishes, and the pans used for cooking were untidily left in the kitchen unwashed. At night rodents enjoyed the leftovers.

By morning, the flying and crawling insects joined making the situation worse. Later on, Zoe's brother prepared a vegetable salad in the same kitchen and served it to the village children, many of whom were his friends.

Typical of village children, they ate every leftover food that was in the kitchen. Whoever ate that salad and the leftover food got severe stomach pain.

Support

Extracts on hygiene and refuse disposal.

Instruction

In view of the above situation, what do you think would be the likely forms of waste found in that kitchen?

Come up with practical ways through which the cooks should have handled the situation.

Summary of Chapter1

In this chapter, you have learnt the:

i) terms used in Nutrition and Food Technology.
ii) influence of food habits and practices in shaping nutrition practices.
iii) importance of living and working in a healthy environment.

Chapter 2: Kitchen Equipment and Kitchen Plans

- **Key Words**
- Equipment
- Measuring
- Cutting
- Mixing
- Cooking
- Cooling

Learning Outcomes:

By the end of this chapter, you will be able to:

a) choose kitchen equipment correctly.
b) care for kitchen equipment well.
c) use fitting skills in carrying out specific tasks.
d) know the different ways of planning a kitchen.
e) draw at least three different kitchen plans.
f) promote comfortable and healthy conditions during work.

Introduction

Every time you think of cooking food, you must also think of the tools to use. Having the right tools for your kitchen makes you work well and produce the right results. Kitchen equipment includes all the things that you use when preparing, cooking, serving and eating food. Different families have different amounts and types of equipment. This is determined by the amount of money available for the equipment in the family. For efficient work, the kitchen must be well planned to avoid fatigue. Kitchen planning involves the proper organization of all equipment for proper flow of work.

Choosing your Kitchen Equipment

Figure 2.1: Sample kitchen equipment

A disorderly kitchen can cause stress and disturbance. A poorly stocked kitchen can also be tiring. Whether you have plenty of equipment or not, you need to properly arrange it. Your kitchen tools need care and maintenance to function well. It is better to keep your equipment clean and in good working condition so that they can work for a long time.

The following is a list of what you might find in some homes: knives, cups, glasses, dinner plates, frying pans, saucepans, strainer, egg lifter, pots, forks, saucers, mixing bowls, chopping boards, vegetable peelers, spoons, jugs, baking dishes, baking pans, baking tins, kettle, soup bowls, stoves, refrigerators and cookers.

Activity 2.1: Categorising and pricing kitchen equipment

Copy the list of kitchen equipment above in your book.

i) Group the equipment above in the categories of measuring, cutting, mixing, cooking and cooling equipment.
ii) Visit a shop or supermarket around and write the prices besides each of the equipment which is available. Compare the prices and the quality of the equipment.

Table 2.1: Categorising kitchen equipment

Copy and complete the table shown below about the categorization of kitchen equipment

Measuring	Cutting	Mixing	Cooking	Cooling

Most kitchen equipment is made from materials such as glass, china (clay), plastic, wood, aluminium, enamel and stainless steel.

Activity 2.2: Naming the materials used for making kitchen equipment

In small groups, think about the materials above and note down the ones you could find in your homes or in the home economics room. Write down the examples of the kitchen equipment made out of each of the materials listed above.

Choice of Kitchen Equipment

Points to consider when choosing kitchen equipment

Have you ever thought of what kind of kitchen equipment you would love to have or use? Buying kitchen equipment can be costly. It is always wise for you to buy equipment that you can afford. You should, however, remember that usually, the more expensive equipment is the better the quality. Quality equipment is made using strong materials to last longer.

Activity 2.3: Giving key points to help you choose your kitchen equipment

i) In groups of five, discuss other important points to consider when choosing kitchen equipment.
ii) Write the points on a manila sheet.
iii) Make a presentation of your group findings to the class.

What you will need to prepare the presentation

- A manila sheet
- A marker

Let us now look at each category of the kitchen equipment

Measuring Equipment

Look at the pictures below.

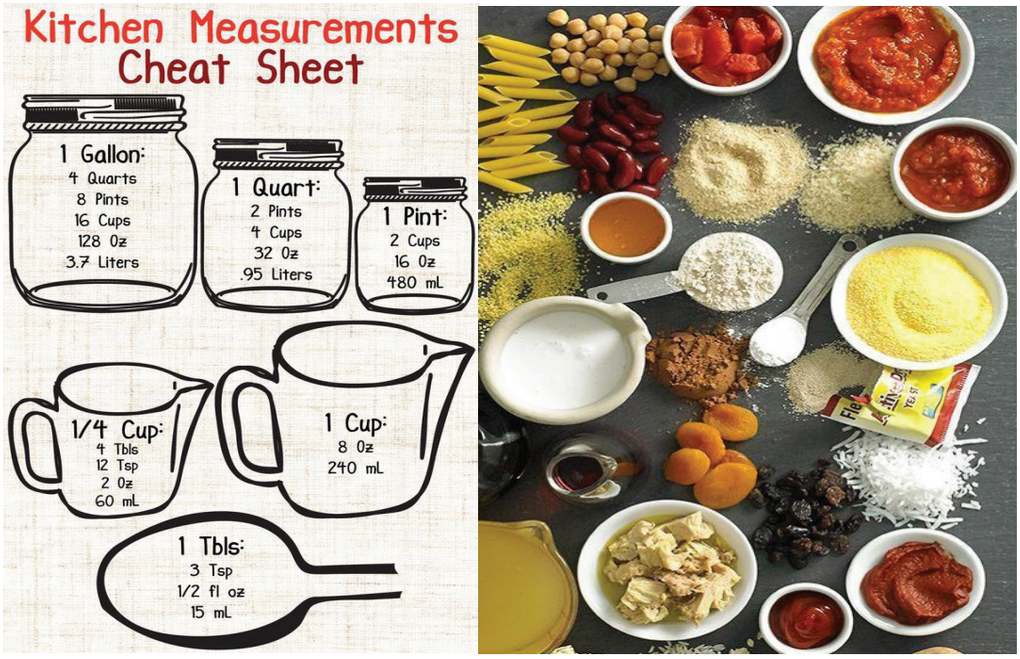


Figure 2.2: Measuring equipment

Accurate weighing or measuring of foodstuffs is essential for correct proportions of different ingredients in relation to another and for ensuring that we produce the expected outcome of a process. Various units are used in the measurement of both solids and liquids i.e. grams, ounces, litres etc.

Activity 2.4: Using hand measures

Make a list of various kitchen equipment used for measuring solids and liquids. Find out the use, advantages and disadvantages of each. Collect various containers used in the kitchen and find out their capacities in terms of weight and volume so that they can be used as hand measures. Compare the accuracy of the hand measures with those of standard measurements.

Cooling Appliances and Equipment

Can you think of different ways of keeping food cool at home? Look at the following examples of cooling equipment: refrigerators, deep freezers, cooling boxes, improvised appliances like charcoal coolers. Do you have any of them in your home?

Cooling boxes

Figure 2.3: cooling equipment

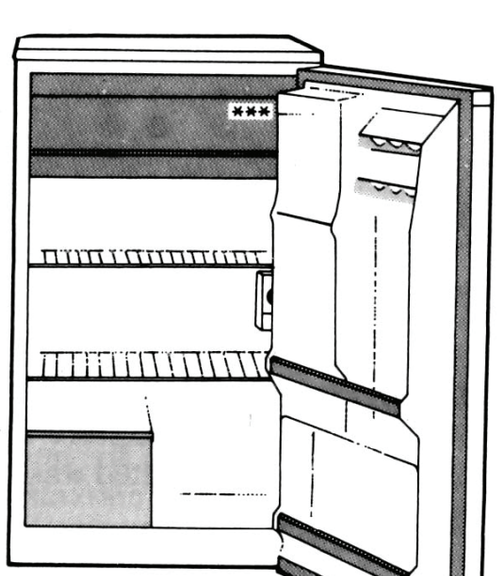


Figure 2.4: Refrigerator

Figure 2.5: Deep freezer

Cutting Equipment

When did you last use a knife? What did you use it for? In the kitchen, we cannot do without cutting equipment because they are very important in the preparation of food. The various types of cutting equipment are designed to meet different purposes. For example, a grater and a blender are needed to give fine products; a knife for coarse products.

Figure 2.6: Various cutting equipment

Activity 2.5: Characterizing cutting equipment

Find out the characteristics, types and the main features of the different cutting equipment

Mixing Equipment

Mixing ingredients together during food preparation is essential. You may need special mixing equipment to carryout particular tasks.

Activity 2.6: Using food mixers

i) List the various tasks in the kitchen that require mixing equipment for ingredients (sieving, folding and beating) and find out the most suitable tool for each task.
ii) Find out the characteristics, types, uses and main features of bowls, sieves, colanders and spoons.
iii) Carry out various activities using the mixing equipment; for example, extracting juice.

Figure 2.7: Mixing bowls

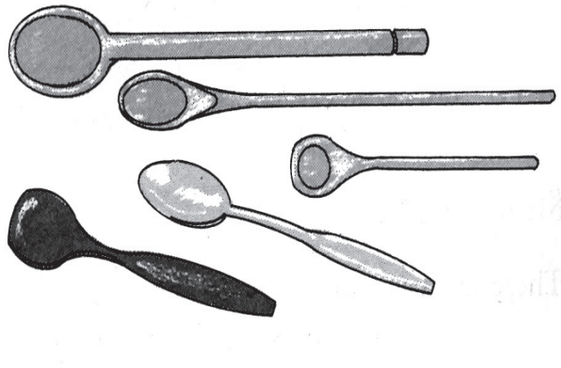


Figure 2.8: Mixing spoons

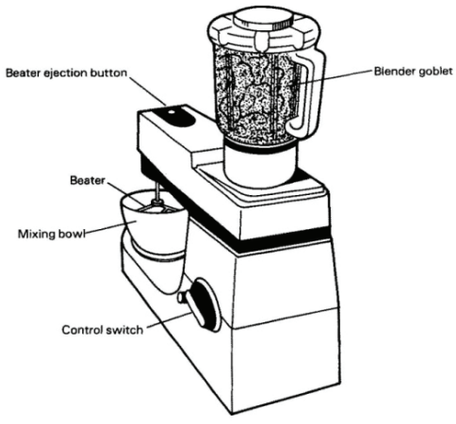


Figure 2.9: Food mixer/processor

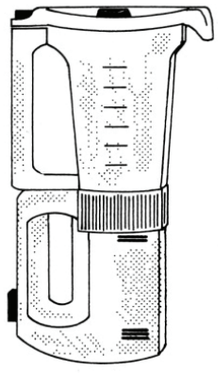


Figure 2:10: Blender

Caring for your Kitchen Equipment

The sustainability of the equipment and tools depend on proper care and handling. Caring for equipment includes practising proper cleaning methods and storage.

Caring for the cooker

Procedure

i) Switch on only when it is necessary

ii) Make use of residual heat

iii) Do not bang the coils

iv) Use a soft abrasive and scourers when cleaning

v) Keep the cooker in good condition. When faults are detected, always consult a good technician to repair it.

Caring for the refrigerator

i) Place the refrigerator away from the heat of the cooker, for this may affect its proper operations.

ii) Do not scrape or chip at ice with a sharp object as this may damage its back coils.

iii) Never leave the door constantly open as warm air that enters reduces its working capacity.

iv) Putting hot things in the refrigerator will spoil it.

v) Do not overload the refrigerator.

Care of knives

i) Knives should be used for the purpose intended.

ii) They should be rust free, durable and without any faults.

iii) Since most knives have wooden handles, they should not be soaked in liquids as wood would get spoilt.

iv) Hot soapy water should be used to clean knives, rinsed well and stored in a separate drawer from the rest to avoid cuts, or they should be hanged in the storage area.

Cooking Appliances

Your choice of cooking method and equipment in relation to heat transfer are always important for preparing quality food. Considerations for choice of cooking appliance include the type of fuel available, type of food, space available, economic factors, personal preference and the finish desired.

Discuss the characteristics, types, uses, advantages, disadvantages and maintenance of cooking appliances such as toasters, sandwich makers, cookers, microwaves, kerosene stores, stoves, charcoal stoves.

Using Cooking or Kitchen Equipment

Adequate kitchen equipment enables you to prepare meals, and if properly used, will help you to save time and energy.

Using a charcoal stove

i) Check and confirm that it has no ash in it.

ii) Fill the stove with just enough charcoal. Avoid overfilling as this will develop the centre piece.

iii) Light using either pieces of wood or paper.

iv) When properly lit, put on what is meant to be cooked.

Using an electric/gas cooker

i) Check that all connections are proper.

ii) Prepare what is to be cooked in advance.

iii) Switch on the cooker knobs and put on.

Using cutlery made of stainless steel

i) Remove all the remains of food.

ii) Wash in hot soapy water.

iii) Rinse in hot water and dry well with a non-fluffy cloth.

iv) Polish with a dry piece of cloth before storing.

Using wooden utensils

i) Using the back of the knife, remove any dirt that could have got stuck onto the surface.

ii) Use warm soapy water and brush or scrub the surface following the grain on the wood.

iii) Rinse and wipe dry with a piece of cloth rinsed with cold water.

iv) Leave to dry in an airy place.

Activity 2.7: Using kitchen equipment

Make use of bowls and sieves in making plain scones. Use colander and spoons to prepare a pulse dish. Clean and appropriately store the equipment after use. Cut vegetables and fruits for salad using the slicer, shredder and grater.

Kitchen Plans

Proper kitchen planning will help you to minimize accidents, save much time and minimize fatigue. It also ensures efficient working.

Kitchen planning is influenced by:

i) Shape, size and layout of area/room

ii) Ventilation

iii) Lighting

iv) Working surfaces

Shape and Size of Area

Your working area should be large enough to accommodate the activities that take place in the kitchen. A very small kitchen would appear very crowded. A very big one would create more movements. To decide on the size of the kitchen, consider the following factors: social-economic status, family size and other activities that take place in it.

The equipment and kitchen units should be positioned in a reasonable order so that food is moved easily through the various stages of preparation. This minimizes fatigue and accidents because moving back and forth would have been minimized.

The preparation of food usually goes through a specific sequence.

Activity 2.8: Drawing kitchen plans

Make a flashback of the kitchen at your home and draw the work sequence for the preparation of food. Consider the following steps:

i) Food storage (larder, refrigeration, vegetable racks)

ii) Preparation (work surface)

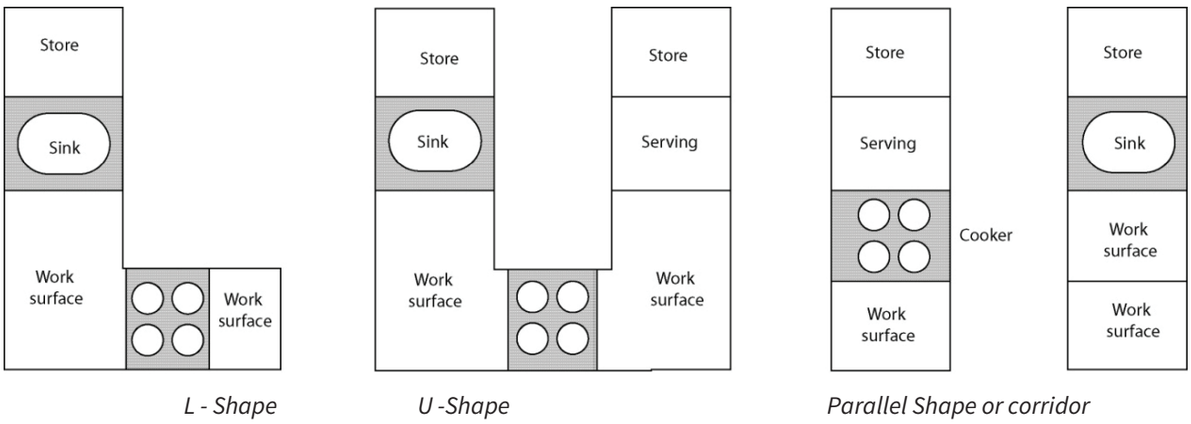
iii) Cleaning up (sink)

iv) Cooking (cooker, stoves)

v) Serving (dining table)

Kitchen layouts

The most efficient kitchen plans are those that are based on the U, L, one wall or parallel line layouts.



L - Shape *U -Shape* *Parallel Shape or corridor*

One wall plan

Figure 2.11: Kitchen plans

i) The height of working surfaces and storage areas should be comfortable enough for one to work without bending or stooping.

ii) The sink is usually placed under a window, or on an outside wall for reasons of plumbing and lighting.

iii) Have work tops on both sides of the cooker to enable pans and serving dishes to be placed.

Activity 2.9: Planning a kitchen

Suggest various ways of improving your kitchen.

Situation of integration

Context: Imagine you are a class captain for your Senior One class. During the Nutrition and Food Technology lesson your class uses kitchen equipment in learning how to prepare meals. How would you work together with the Nutrition and Food Technology teacher to ensure that the preparation of meals is improved by the right choice of kitchen equipment?

Support:

1. Literature on kitchen equipment
2. Samples of different categories of kitchen equipment

Instruction:

i) Make illustrations on the use of each of the different categories of kitchen equipment.

ii) Make a write-up on the choice of kitchen equipment.

iii) Present the illustrations and the write up to your class.

Summary of Chapter 2

In this chapter, you have learnt to:

i) choose equipment for your kitchen.
ii) use kitchen equipment.
iii) care for the kitchen equipment.

Chapter 3: Safety in the Home

Key Words

- Accidents
- First aid
- Ventilation
- Work surfaces
- Contamination
- Supplementation
- Purification

Learning Outcomes

By the end of this chapter, you should be able to:

a) prevent accidents in the home.
b) administer first aid to save lives.
c) choose suitable lighting for the home.
d) explain the importance of good ventilation in the home.
e) choose suitable work surfaces for the kitchen.
f) explain the sources and uses of water in the home.
g) purify water at home using basic methods.
h) construct a sand filter.

Introduction

Your home should be the safest place to live in. However, this may not always be the case. Many accidents happen in the home every day and this could be due to carelessness. In order to prevent accidents, you should make sure that every place is made as safe as possible to live in and work from. You should ensure proper lighting and ventilation. In everything you do, use clean water. You should also promote a safe and healthy working environment.

How can you prevent accidents in the Home?

Look at the figure below.

Figure 3.1: Accidents during cooking

How would you ensure that the child does not reach the pan on the cooker? There is a common saying that, 'Prevention is better than cure'.

Activity 3.1: Ensuring safety in the home

Table 3.1: Keeping your home safe

The points in the following table can help you to make the home a safe place. Please fill in the missing safety points and reasons.

No.	Safety points	Reasons
1.	You should always have good light and ventilation.	Accidents can easily occur in the place with insufficient light and ventilation.
2.		If handled carelessly, they can cause cuts, pricks and bleeding.
3.	Always make sure that the floor is dry.	
4.		Scattered items can easily cause falls.
5.	Ensure proper storage of medicine and cleaning agents.	
6.	All electrical equipment, wires, sockets and switches should always be checked and kept in good condition.	Faulty electrical equipment and exposed wires can cause electric shock and death.
7.	Keep your hands dry when handling electrical equipment and switches. Avoid wet floors when using electrical equipment, and always wear rubber footwear.	Wet hands and floors easily conduct electricity, and thus causing shock or even death.
8.	The cooking area should be raised.	
9.	Handle hot equipment with a kitchen towel or kitchen gloves.	
10.	Place kettles, flasks and other hot things away from the edge of the table	
11.	Keep children away from the cooking place	This helps to avoid burns.
12.	Keep spray cans away from fire.	They can easily explode when heated.
13.	Avoid table clothes that overhang deeply.	

First aid

Did you know that it is very important for every family member to know what to do in case of an accident or illness at home? This is very key and you should take it as a matter of urgency especially when it has to do with accidents.

First aid is an immediate and temporal care given to a person who is injured or has become ill or on the way to hospital or while waiting for the arrival of a doctor. It is therefore, very important for you to understand the rules of first aid so that you can apply them.

Rules for first aid

1. When giving first aid remain calm.
2. Organize treatment and do most important things first.
3. Move the patient as little as possible and handle him/her gently.
4. Reassure the patient and if necessary treat for shock.
5. Discourage people from crowding around so that the patient gets sufficient air.
6. Call for medical help.

First aid box

You will always find a first aid kit very important whenever there is an accident. This is because it saves time and makes it easy to give immediate help to a casualty. Every home, school and place of work should have a first aid kit. You need to keep this safely in a known place but away from the reach of children. You can improvise a box or plastic container as a first aid kit but it should be strong and waterproof or air tight to prevent some of the contents from rusting. You should examine it from time to time and replace used up items.

Activity 3.2: Assembling a first aid kit

- In buzz/group session, identify the essential items that must be in a first aid kit and discuss their uses.
- Using a box/plastic container assemble a first aid kit and label it.
- Store this for use in a suitable place in the classroom.

First aid treatment for common accidents

As a first aider you must have knowledge of certain acceptable skills which you may use to treat the patient in an emergency. Use of the wrong treatment could cause permanent damage or death. It is always important for you to give reassurance to the casualty no matter how bad the accident may be, and to ensure that you and the casualty are safe.

Activity 3.3: Administering first aid treatment for common accidents

- In groups, find out from the Internet how the following accidents are treated: cuts and wounds, nose bleeding, burns and scalds, clothes on fire, electric shock, poisoning, fainting, choking and shock.
- In your books, write down the accident and the first aid treatment.
- Draw some of the first aid procedure on a manila paper.
- Present this to the class.
- Demonstrate one way of carrying out a first aid treatment for the accident.

Importance of lighting in the home

In order for you to do your job well, you need to be able to see. Lighting in the kitchen is, therefore, very important. For safety in the home, light must be bright enough to avoid accidents. Daylight needs to be well spread in the house, and it can be supplemented with artificial light. The main work areas in the kitchen should be lit properly.

Activity 3.4: Choosing lighting for different rooms

In groups, discuss the choices of lighting in different rooms in the home.

Importance of proper ventilation in the home

Sufficient lighting in the home in itself is not enough to make it a safe place. There is need to ensure proper ventilation. This influences air quality and burning of fuel in the kitchen. It will help you to remove waste products like moisture, heat, grease and gases from the house. This will prevent dampness in the room, too much heat, and bad odours in the house. Poor ventilation may result in respiratory diseases. Proper ventilation will also supplement on the amount of light received in the house.

Activity3.5: Ensuring proper ventilation

Your brother Kabi used to sell "*kikomando*" (beans and chapatti) to earn a living. He used to cook the beans overnight in his one-roomed house. One day, he was so tired that he slept without putting off the charcoal stove. Unfortunately, he was found dead in the morning.

What do you think could have led to his death?

Using Proper Work Surfaces in the Home

In order to carry out a particular job successfully, you need a work surface. The surfaces should be comfortable to work from, easy to clean, heat resistant, scratch proof, waterproof, resistant to chemicals and hard wearing. You should also make sure that your work surface is at the right height. Work surfaces should be placed where there is enough lighting.

Table 3.2: Characteristics of materials for work surfaces

Activity 3.6: Identify the characteristics of different materials used for work surfaces. Put a tick (√) where applicable.

Material	Easy to clean	Heat resistance	Hard wearing
Hardwood			
Tiles	√		
Plastic			
Stainless steel			√
Concrete		√	

Water in the Home

The most important uses for water are at our homes. Water at home is mainly used for indoor and outdoor household uses. You need water for all the things you do at home like drinking, preparing food, bathing, washing your clothes and dishes, brushing your teeth and, watering the yard and garden.

Without water, you will die in just a few days. Have you ever heard of this common saying: that, “water is life”? Apart from drinking it to survive, people have many other uses for water.

Uses of Water in the Home

It is important that the water you drink and use for other purposes is **clean water**. This means that the water must be free of germs and chemicals. Such water should be clear.

Activity 3.7: Using water in the home

In groups, discuss the uses of water in the home.

Sources of Water

Where do you get the water you use at home? There are different sources of water.

Activity 3.8: Identifying sources of water

In groups, identify the different sources of water used in the home. List the advantages and disadvantages of each source.

Contamination of Water in the Community

The sources of water are easily contaminated in the following ways:

1. Runoff water
2. Wastewater
3. Air pollution
4. Eroded soil
5. Sewage

Each of the above ways contaminates water in a different way and with different effects.

Activity3.9: Describing ways through which water contaminated

In groups, describe how water is contaminated through each of the ways above.

Methods of Purifying Water in the Home

It is important to know that even when water gets contaminated, you can still make it safe for use. You can do this by purifying your water at home. This makes it safe for drinking and for food preparation. Several methods can be used to make water safe for home use.

Activity 3.10: Purifying water in the home

Carryout the following method of purifying water at home:

1. Boiling
2. Addition of chemicals
3. Filtration

Straining Water through Cloth

Figure 3.2: Purifying water at home

It is easy to filter water using a piece of cloth. This is called simple filtration. By this you are able to remove the main solid particles from water as well as any insect larvae that it may contain. Use cotton cloth which is thick enough to properly keep the impurities. If the cloth is too thick, then filtration will take longer time. The cloth of cotton used must always be washed after to use.

Straining alone is not enough to ensure that the water is safe for drinking. It should be boiled to kill the germs.

a) Advantages

1. It is simple to use.
2. It is almost at no cost.
3. It is very useful and even essential for pre-treatment purposes.

b) Disadvantages

It does not make water completely safe for drinking.

The Three Pan or Bucket Method

This method works in the same way as filtration by removing the main solid particles found in water.

Procedure

i) Pour dirty water in a pan or bucket and leave it for about 30 minutes to settle.
ii) Carefully pour the clear water into another pan.
iii) Allow it to settle for at least30 minutes.
iv) Pour the clearer water into the third pan.
v) At this stage, the water is clear and ready for use or boiling for drinking.

Figure 3.3: Use of the three pot/pan/bucket method

Treatment by Boiling

Boiling is the simplest method you can use to purify water. When you boil water, you kill the germs that contaminate water. Before boiling the water, you should first filter to remove all the solid particles.

Procedure for boiling water

i) Cooking facilities with heat
ii) Filter the water and place it in a clean pan.
iii) Place the pan on the source of heat and bring to boil.
iv) After it has started boiling, leave it for 10–15 minutes before removing the heat. By doing this, you will ensure that all the germs and their eggs are killed.
v) Remove the water from the source of heat and let it cool before drinking.
vi)

a) Advantages

i) It is easy to use.
ii) It kills all germs.

b) Disadvantages

i) High costs of fuel
ii) Needs time

Treatment by Addition of Chemicals

Addition of chlorine is a simple and helpful way of disinfecting water to make it safe for drinking. You can add chlorine tablets or bleach into the water to kill the germs found in it. After adding chlorine, leave it for 30 minutes. After this, the water will be safe for drinking. This water remains safe for a few days depending on the storage conditions.

a) Advantages

i) Muddy water can be made safe for drinking.
ii) If the treatment is done properly, all of the germs are killed.
iii) Addition of chlorine has a durable effect.

b) Disadvantages

i) Handling risks involved.
ii) The chemical may not be easily available.

Treatment by Using Homemade Filter

A homemade filter works by letting the water seep through layers of sand, charcoal and small stones. Fill the bottom third of the bottle with activated charcoal, the middle third with sand, and the top third with gravel. To use the filter, pour water into the bottle and let it drip through the hole in the bucket.

Advantages

i) Low cost
ii) Easy to use

Disadvantages

i) Allows only little water
ii) It does not make the water safe for drinking, so there is need to boil it or add chemicals thereafter.

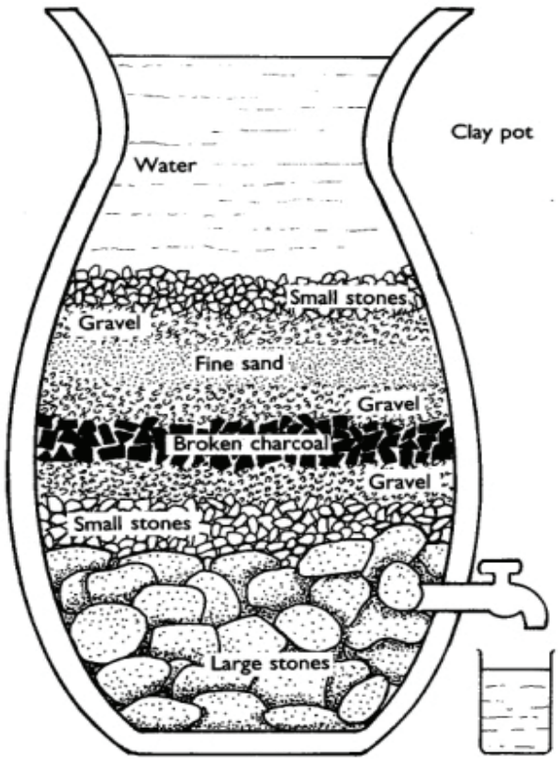


Figure 3.5: Using a homemade filter

A – Fine sand
B – Course sand
C – Charcoal
D – Stones

Project: Set up a project on water purification to ensure clean supply of water in the school and at home. Write a report.

Activity 3.11: Carryout a research to find out the different things that contaminate water in your community.

Situation of Integration

Context

Many accidents take place in the home every day. Most of these are due to carelessness. They can be prevented when you make sure that the kitchen has good ventilation, enough lighting and that you use clean water.

Support: A situation where you have a disorganized room with many activities taking place.

Read the rules for preventing accidents in the home

Task: What accidents are likely to happen in the picture above?

What would you do to prevent them?

Summary of Chapter 3

In this chapter, you have learned

i) how to prevent accidents at home.
ii) the importance of proper lighting and ventilation in the home.
iii) using proper work surfaces.
iv) the importance of using clean water.

Chapter 4: Proteins

Key Words

- Imbalances
- PEM
- Kwashiorkor
- Amino acids

Learning outcomes

By the end of this chapter, you will be able to:

a) state the sources and functions of proteins.
b) manage the effects of an imbalanced intake of proteins in the body.
c) explain the characteristics of protein foods.

Introduction

Proteins are body building foods made up of carbon, hydrogen, oxygen and nitrogen. They are responsible for growth of body cells and tissues. Our bodies contain millions of cells that need to be made and repaired. As the body grows, new cells are added. Others die and have to be replaced. You, therefore, need protein in your daily diet even when you stop growing. During the growth period of life, proteins are needed in higher amounts.

Sources and Functions of Proteins

There are two types of foods that contain protein. These are animal foods and plant foods.

Table 4.1: Food sources of protein in the diet

Activity 4.1: Classifying proteins according to their sources

Copy the following table in your exercise book and fill in the animal and the plant protein foods.

Animal sources	Plant sources

The body can easily use proteins of animal origin to make and repair tissues. The protein of animal origin is called complete protein. This is because it contains all the amino acids that the body requires. Plant protein foods are called incomplete proteins. This is because they do not contain all the essential amino acids required by the body. When serving food with plant protein, make sure that you use them in combination. In this way, the amino acids lacking in one protein food can be made good by those present in another protein food.

Functions of Proteins in the Body

Who needs proteins? To some people, eating protein foods is more important than any other. This is determined by the body requirement or demand.

Activity 4.2: Researching the functions of protein in the diet

1. In groups, use the Internet or the library to research and discuss the functions of proteins in the diet.
2. Present your findings to the whole class.

Importance of proteins in the body

It is important that your body gets the right amounts of proteins if it is to function well. Sometimes, your body may get too little or too much protein. This creates an imbalance in the body. Look at the pictures below. **What do you think would happen when you do not get the right amounts of protein in your diet?**

Figure 4.1: *A child with the effect of an imbalanced intake of protein*

Can you identify the abnormal features in the picture above?

Activity 4.3: Managing protein imbalances

Work together with your friends to describe the different ways of managing protein imbalances in the body.

Effect of Heat on Protein Foods

Protein coagulates when exposed to heat. This causes the protein in food to set and solidify during cooking.

Activity 4.4: Finding out the effect of heat on protein foods

In groups, carry out the preparation of the following to find out the effects of heat on protein:

i) Scrambled egg/pouched egg/egg custard
ii) Meat cookery i.e. meat ball/meat stew
iii) Boiling milk

Situation of Integration

Context:

In Namukisa village, the common practice is feeding on green bananas (*matooke*) and plain bitter tomatoes locally known as *ntula*. Sometimes they mix the *ntula* with groundnuts. Sayanza, a three-year-old child was always fed on this menu with cassava and a cup of plain maize porridge for breakfast. After two years, his cheeks, feet and arms started swelling and peeling. His hair turned brown and started thinning. The stomach became round and protruding.

Support

Text on the place of proteins in the diet

A photo of a malnourished child

Task

1. In your opinion, what do you think this child is suffering from?
2. What advice would you give to the community about this feeding practice?

Summary of Chapter 4

In this chapter, you have learned:

i) The sources and functions of proteins.
ii) How to manage the effects of an imbalanced intake of protein in the body.
iii) The effect of heat on protein foods.

Chapter 5: Carbohydrates

Key Words

- Caramelisation
- Dextrinisation
- Gelatinization
- Crystallization
- Monosaccharides
- Disaccharides
- Polysaccharides
- Obesity
- Marasmus

Learning outcomes

By the end of this chapter, you will be able to:

d) give the sources of and explain the functions of carbohydrates.
e) control the effects of an imbalanced intake of carbohydrates in the body.
f) explain the characteristics of carbohydrate foods.

Carbohydrates are an important source of energy that have a protein sparing effect. This means that protein can be used for its primary functions rather than as a source of energy when carbohydrates are provided. They are made up of three elements, that is, carbon, hydrogen and oxygen. Carbohydrate foods are the cheapest foods available and they tend to be eaten in larger quantities than necessary. The excess is converted into fat and stored under the skin. This is one of the causes of **obesity.** They should therefore be taken in controlled amounts. If one takes less carbohydrate foods than is required, it leads to **marasmus**.

Sources of Carbohydrates

Carbohydrates are mainly obtained from plant sources.

Activity 5.1: Stating sources and classifying carbohydrates

1. In groups, list the different sources of carbohydrates in the diet.
2. Classify carbohydrates.

Functions of Carbohydrates in the Body

Carbohydrates perform a number of functions in our bodies.

Activity 5.2: Researching on the functions of carbohydrates

In groups, use the library or the Internet to find out the functions of carbohydrates in the body. Present your findings to the class.

Effects of Imbalanced Intake of Carbohydrates in the Body

You should control the consumption of carbohydrates in the diet. Too little or too much of it will cause problems to your body. Have you ever seen anyone that looked like them? Look at the pictures below.

Figure 5.1: A marasmic child

Figure 5.2: An obese person

Activity 5.3: Finding the effects of consuming wrong proportions of carbohydrates

In small groups, compare the two pictures above. Use them to help you to explain the effects of an imbalanced intake of carbohydrates in the body. Still in your groups, explain the different ways of managing carbohydrate imbalances in the body.

Properties of Carbohydrates

Sugars

i) They are all sweet.
ii) They dissolve in water.
iii) Disaccharides can be broken down by combining them with water; for example, sucrose is broken down to glucose and fructose, maltose to two molecules of glucose and lactose, glucose and galactose.
iv) Glucose, fructose and maltose have reducing powers. They remove oxygen from a substance.
v) Sugar turns brown and caramelizes at high temperatures.
vi) When you add too much sugar to water, it becomes over saturated and crystals are formed.

Starch

i) It does not dissolve in cold water.
ii) It is not sweet to taste.
iii) It can be broken down to dextrin, then to monosaccharides.
iv) Dry heat on starchy foods forms a brown coloured compound known as dextrin.

v) When starch and water are heated, water enters the starch particles. The starch absorbs the water and swells and the liquid becomes thicker.
vi) At high temperatures, the mixture becomes thicker and sticky due to starch gelatinization.
vii) Cellulose is indigestible and insoluble in water.

Activity 5.4: Understanding the properties of carbohydrates

In groups, make the following dishes and observe the properties of carbohydrates.

i) Making porridge – gelatinization
ii) Roasting potato/cassava/toasting bread – dextrinisation
iii) Browning beef stew with caramel - caramelisation

Making Snacks

You will learn to make at least two cookery skills in this section with different methods of cooking. Such methods may be baking or frying.

Activity 5.5: Making snacks

i) In groups of 15, make a baked snack (e.g., scones) and a fried snack (e.g., *gonja, kabalagala*, tiny half cakes).
ii) Cost and pack for sale.

Situation of integration: "Lato's sister"

Context: Your friend Lato has a sister with a high appetite. In the morning, she enjoys eating *mandazi* and millet porridge. At break time, she eats a chapatti. She also eats ice cream during her free time. At lunch time, she eats *posho* meal and beans. In the evening, she enjoys taking milk tea with cakes. She also likes having chips and sausage for supper. She enjoys keeping her mouth busy with sweets even during class time. Her friends at school are talking about her love for food.

Task:

1. In your opinion, why do you think the classmates of Lato's sister are talking about her?
2. Suggest two ways in which you would help Lato's sister to deal with the challenge.

Support:

- A picture of a very fat girl enjoying her food.
- Reading material (a short article or an abstract) on the overconsumption of carbohydrates.

Summary of Chapter5

In this chapter, you have learned:

i) What carbohydrates are and what they do in the body.
ii) How to use carbohydrates in the diet and manage their imbalances in the body.
iii) What happens when you apply heat on carbohydrates.
iv) How to make snacks.

Chapter 6: Mineral Salts

Yogurt

Radishes

Carrots

Potatoes

sardines

Eggs

Key Words

- Mineral salts
- Mineral elements
- Major minerals
- Trace mineral

Learning outcomes

By the end of this chapter, you will be able to:

g) explain the classification, state sources and explain functions of mineral salts in the body.
h) manage common mineral intake imbalances in the body.
i) explain the factors that affect the absorption of mineral salts.

Introduction

Your body needs mineral elements in small quantities. Does this mean that they are not important? No. They are very essential to the formation of body structure and maintenance of health. If they are not included in the diet, various deficiency diseases may occur. They are all water soluble and therefore care must be taken during preparation and cooking of foods rich in minerals to minimize loss. By so doing, you will be able to retain the nutrients during food preparation. This ensures their intake and therefore prevention of imbalances.

Activity 6.1: Conserving mineral salts when preparing vegetables

In groups, use locally available vegetables to prepare a salad to demonstrate how you can retain nutrients.

Classification of Mineral Salts

Mention some of the mineral salts that you know. They are grouped into two main groups. These are

1. macro-elements.
2. trace-elements.

Macro elements are the ones needed in larger quantities. Trace elements are those needed in smaller quantities.

Examples of macro elements are calcium, phosphorus, potassium, sodium and chlorine. Examples of trace elements are iron, iodine, zinc, and fluoride.

Sources and Functions of Mineral Salts in the Diet

Table 6.1: Sources and functions of mineral salts

Activity 6.2: Copy the table below in your book and fill in the missing sources and functions of the given mineral salts.

Name	Sources	Function
Calcium	Cheese, milk, bonny fish	
Sodium		
Phosphorus		1. Combines with calcium to form bones and teeth 2. Used in the release of energy from cells 3. Maintains body fluids 4. Maintains body cells
Potassium		
Fluorine	Fluorinated water, sea water fish	
Iron		
Iodine		
Zinc		1. Growth and development 2. A component of some enzymes

Activity 6.3: Explaining the importance of mineral salts

In small groups, design a leaflet for your parents/guardians, explaining the importance of mineral salts in the body. List the foods that richly provide specific minerals in the diet.

Effects of Imbalanced Intake of Minerals in the Body and their Management

Symptoms of lack of calcium in the body

1. Related to rickets since it works together with Vitamin D
2. Failure of new bone and cartilage to harden, leading to bone problems
3. Bow legs in children
4. Deformed hip bones in women

Symptoms of too much intake of calcium

Calcium is deposited in the soft tissues of the body. This leads to loss of appetite, to nausea, vomiting, constipation and diarrhoea.

Symptoms of lack of phosphorus in the body

Symptoms of lack of phosphate in the body are unknown because it is widely found in food.

Activity 6.4: Managing different conditions of mineral imbalances in the body

i) Explain how you would manage the different conditions that result from failure to take the right amounts of minerals in the body.
ii) Design a message for your parents or guardians to show the importance of mineral salts in the diet.

Factors that Affect Absorption of Mineral

i) Mineral absorption varies from one mineral to another and by the form of the mineral. With many minerals, their absorption decreases as the amount in the diet increases.
ii) Some acids bind to a variety of minerals to form insoluble salts which cannot be absorbed by the body.
iii) Some nutrients enhance the absorption of minerals while others interfere with the process.
iv) Undiagnosed disease also interferes with mineral absorption.

v) Overconsumption of caffeine interferes with the absorption of a number of minerals.

Situation of Integration

Context

Your niece who is 5 years old has been in and out of hospital several times in the last 6 months. It has been because of malaria and, at other times, because of worms and other infections. Currently, she is admitted with malaria. Her eyes and skin are pale and light and most times, she feels dizzy.

Support:

A booklet on malnutrition

Task:

1. What do you think would be the nutritional challenges this child is likely to be experiencing?
2. As a learner in the Nutrition and Food Technology class, you have been given the task of coming up with suitable meals that would help this child to regain her normal health status. Select five foods that are rich in a nutrient that you think will help your niece.

Summary of Chapter 6

In this chapter, you have learned the

i) classification, sources and functions of mineral salts in the body.
ii) different ways of managing mineral imbalances in the body.
iii) factors that affect the absorption of mineral salts in the body.

Chapter 7: Vegetable Processing and Preservation

Key Words

- Value addition
- Herbs
- Spices
- Blanching
- Solar drying
- Chutney
- Sauces
- Pickles
- Microbial
- Enzymatic
- Spoilage
- Food poisoning

Learning outcomes

By the end of this chapter, you will be able to:

a) sort the vegetables/herbs/spices for drying.
b) blanch vegetables (where applicable) in preparation for drying.
c) dry vegetables/herbs/spices using a solar drier or a low temperature oven.
d) pound/crush/grind dried vegetables/herbs /spices into powder.
e) package, label and sell the processed vegetables.
f) follow recipes to prepare pickles, chutney and sauces.
g) Package, labels and sells the processed vegetables. (u,s,v,gs)
h) Develop recipes for processing vegetables (u,s,v,gs)

Introduction

Have you ever thought of why there is so much vegetable that rots around when they are in plenty? Did you think of any idea of extending their shelf-life? Vegetables are one of perishable food items. However, you can extend vegetable shelf-life through processing and preservation. You are able to preserve vegetables using a number of processing methods. These depend on the type of vegetables you are dealing with. Because of limited processing skills, most vegetables are consumed immediately they are harvested.

In this chapter, you will develop skills of growing, processing and adding value to vegetables. This will be an effort to ensure food security and increasing vegetable supply and use. You will do this by drying or by the use of chemicals.

Classification of Vegetables

You can classify vegetables according to the part that is usually eaten. Many vegetables can be grown in the home for various purposes. You are free to eat them in a variety of ways as part of the main meal or a snack.

Activity 7.1: Categorising vegetables

Categorise vegetables according to the different parts that are eaten.

Activity 7.2: Growing vegetables

In groups of 20, plant 1 vegetable which you are expected to take care of and harvest in less than 2 months.

Vegetable Juices and Smoothies

Did you know that vegetables can be used to make juices and smoothies?

Activity 7.3: Making vegetable juices and smoothies

In groups of 10, make a juice and smoothie from at least 2 vegetables using a scrapping knife, grater or blender where appropriate.

Drying Vegetables

Drying is one of the simplest and most common methods of preserving fresh vegetables. Drying is the removal of moisture or water from harvested vegetables. In this sub-topic, you will acquire the skills used in drying vegetables. Dried vegetables are frequently used in soups and stews.

Drying vegetables removes the moisture so that bacteria, yeasts and moulds cannot grow and spoil them. It also slows down the action of enzymes, but does not kill them. Because drying removes moisture, the vegetable becomes smaller and lighter in weight. The recommended temperature for drying vegetables is 60° C. If higher temperatures are used, the vegetables may harden on the surface while retaining moisture on the inside. This will make them mould. Therefore, the drying process should never be hurried by raising the drying temperature.

Identifying a vegetable processed by drying

Drying vegetables is practised by people in your community every day. Vegetable drying requires care and attention in order to save the nutrients in them.

Activity 7.4: Carrying out a market research on vegetable processing

i) Visit a nearby market to find out what is done to the fresh vegetables that are not sold. What happens to these vegetables after a day, a week and a month? How helpful are the proposed methods of preserving vegetables? Also ask two or three households how they preserve the vegetables they want to eat after one month or more. If you had access to all things you need, how would you preserve those vegetable? Suggest reasons why you would dry vegetables.
ii) In your group, list down the vegetables that can be dried and give reasons why you need to dry them?
iii) In your exercise book, name any other vegetables that can be processed by drying.
iv) Present your findings to the class.

Sorting Vegetables for Drying

When sorting vegetables for drying, good parts are separated from bad ones in order for them to dry properly. Good quality vegetables dry well and quickly because they can be easily displayed when drying.

Activity 7.5: Sorting Vegetables

i) Share with your neighbour the answer to these questions: Do you eat vegetables at home? How do you separate those ones you are going to eat from those you do not want? What do you do with those you do not want to eat?
ii) In groups, choose one vegetable for drying and write down on a manila or flipchart the steps you will follow when sorting it. Present your work to the class.
iii) Prepare vegetables by sorting them for drying.

Blanching Vegetables

Have you ever heard of the word **blanching?** It means putting sorted and washed vegetables into hot salty water or steam in order to stop the actions which cause loss of colour and flavour before drying. Blanching vegetables helps in the following ways:

i) It stops enzyme actions which can cause loss of flavour, colour and texture.

ii) It cleanses the surface of dirt, bacteria, moulds and other organisms.

iii) It brightens the colour.

iv) It helps retard loss of vitamins.

v) It softens fruits and makes them easier to pack.

Blanching time is essential and varies with the type of vegetable. Under-blanching stimulates the activity of enzymes and is worse than no blanching at all. Over-blanching on the other hand causes loss of flavour, colour, vitamins and minerals.

Before processing vegetables, place them in hot salty water. Allow them to blanch for about 5 minutes. You can now drain them for 2 or 3 minutes.

You should make sure that most of the nutrients are saved. This will help you to make products that are nutritious.

Activity 7.6: Identifying vegetables for blanching

Look at the photographs of vegetables below. Which ones have you seen before? Can you name them?

Figure 7.1: Different types of vegetables

In your exercise book, write the names of the vegetables from the photos above that require blanching.

a._____

b._____

c._____

d. _____

e. _____

f. _____

g. _____

i. _____

Activity 7.7: Drying vegetables in the oven

What you will need:

- Cooker/oven
- Oven tray
- Paper for covering the tray
- A knife
- Vegetable
- Source of heat

Procedure

i) Set your oven to 60 degrees or its lowest setting

ii) Slice vegetables into bite-sized pieces

iii) Blanch the raw vegetables

iv) Cover the baking tray with paper

v) Place the sliced vegetables on the tray

vi) Place in the warm oven until they are dry

Hint: Keep checking and turning the vegetables while drying

Activity 7.8: Making and using a solar dryer

In groups, make a solar dryer and use it to dry a vegetable of your choice

Figure 7.2: Making a solar drier

What you will need:

- Cardboards
- Colourless polythene sheet/clear iron sheet
- A wooden stand
- Small nails for fixing
- Trays
- A vegetable of your choice

Procedure:

- Craft a frame–length and width depends upon your choice
- Join the sides together to make a perfect shape
- Add a door at the front
- Use trays for support
- Insert heat absorber
- Add cover to the frame

Processing Dried Vegetables into Powder

Figure 7.3: Making carrot powder

You can process tomatoes and carrots in any way you desire. You can process them cooked or raw, peeled or unpeeled or even sliced and then put into a food processor. You can also puree and then powder them.

Guidelines for grinding vegetables into powder

i) Dry the food to be processed well to remove water. You can check this by dropping onto a table. If it makes a clinking sound, you will know that you have removed most of the moisture.

ii) Some foods will powder easily with mortar and pestle, but a food processor will be required for most foods and for larger quantities.

iii) Store the powdered vegetable in tightly sealed bags if you are to store for a long time. Keep in a dry dark place.

iv) If it is to be used immediately, place the powder in a jar. The jar should be closed tightly to remove oxygen. Keep away from heat, steam and light.

To make vegetable powders:

i) wash and rinse spinach and other leaves, herbs, kale etc. Dry them well. You can make the leafy greens into powder by pounding them in a food processor or breaking them up with your hands or using a mortar and pestle.

ii) slice or chop garlic and onions and then arrange them onto trays. Once moisture is removed, pound in a food processor or use a mortar and pestle to prepare a small quantity for immediate use.

Benefits of using powders

i) You can use them as a thickener to soups, stews and casseroles.

ii) You can use them to add flavour in unusual ways; for example, carrot powder in meat dishes, chapattis and cookies.

iii) Vegetable powder is good long-term food storage because it is light and the quality is not easily compromised from air exposure.

iv) You can use them for making your dishes more nutritious.

Packaging Materials and Labelling for Processed Vegetables

Some of the materials that may be used for packaging vegetables include:

i) Airtight glass containers

ii) Airtight plastic containers

iii) Strong polythene can be sealed

iv) Aluminium foil

After packaging your processed vegetables, it is important to attach a label. This should show the user the following:

i) ingredients used for making the product

ii) uses of the product

iii) directions for use

iv) the date for making the product and the expiry

Preparing and Using the Dried Vegetables

After drying your vegetables, you can now use them as desired. Some of the ways you could use dried vegetables are as follows:

i) One cup of dried vegetables reconstitutes about 2 cups.
ii) To rehydrate and cook leafy or tender vegetables (spinach, kale, cabbage, chard, tomatoes), cover with hot water and simmer to desired tenderness.
iii) Soak root, stem and seed vegetables (carrots, green beans, peas, corn) before cooking.

Dried vegetables last for a very long time. This makes them an excellent alternative food to have in your store. The following are some tips to get the most from your dried vegetables.

- **Store in a dry location**—this prevents moisture from finding its way into the containers where the vegetables are stored. Place a sachet filled with rice in the glass jar with the vegetables. The rice draws out any moisture that might make its way into the vegetables.
- **Use spices in the preparation of dried vegetables**—these help to improve the flavour that could have been lost during preparation. You may add ginger, turmeric, cumin garlic, onion and red pepper sauce to your vegetable dishes.
- **Rehydrate using warm water**—the fastest way to rehydrate dried vegetables is by pouring boiling water over them. Place the desired amount of dehydrated vegetables in a bowl and cover with almost twice as much boiling water. You can always drain off any excess water, if your recipe doesn't call for any, or use the vegetables and the water for soup.

Preserving Vegetables Using Chemicals

In this sub-topic, you will process vegetables, sauces and pickles using chemicals. You are expected to do, among many things, sorting and washing vegetables, peeling, chopping, blanching, sieving, milling/pounding, blending foods together; seasoning, colouring and grinding.

The nature and composition of food makes it susceptible to microbial and enzymatic spoilage. In order to control the introduction of microbes, food should be prepared and served or stored in a hygienic way.

How chemicals work to preserve food

Chemicals work by drawing water out of the micro-organisms. This creates an unfavourable environment for enzyme activity and micro-organisms. Some of them also contain substances that are toxic to the micro-organisms. The household chemicals used in food preservation are salt, sugar, vinegar and fermentation products.

Vinegar contains acetic acid which creates an unfavourable environment for the action of enzymes and micro-organisms. It is made use of in pickles and chutney, processes which also make use of heat treatment and sealing in sterile airtight jars. It is suitable for onions, beetroot, carrots and hard boiled eggs.

You will apply some of these recipes when preserving your vegetables:

Making Pickles

When making pickles you will use spices and acids. The common ones are salt, vinegar, mixed spice, chilli, black pepper and white pepper.

Ingredients

- Vegetables
- 1 litre vinegar
- Brine solution (100 g salt to 500 ml water) 25 g spices

Method

i) Wash and peel vegetables and remove any tough parts
ii) Cut up, if necessary
iii) Soak in the brine solution for 24 hours
iv) Rinse, drain and pack into jars, leaving a 1 cm space at the top
v) Heat the vinegar and spice for 5 minutes and leave to cool
vi) Pour the cooled vinegar mixture into the jars and cover securely
vii) Label and store

Activity 7.9: Writing a recipe for a vegetable pickle

Find out and write down a recipe for making a vegetable pickle.

You can have several ways of processing vegetables using chemicals. Some of these include the following:

Red tomato chutney

Ingredients

2 kg red tomatoes	6 cloves garlic
2 medium-sized onions	1 teaspoon ground ginger
250 kg sugar	½ litre white vinegar

Method

i) Cut up vegetables into small pieces

ii) Cook them in a little water until soft

iii) Add vinegar, spices and sugar and cook gently until thick

iv) Bottle in hot sterile jars and cover

Tomato sauce

Ingredients

- 10 ripe tomatoes
- 2 tablespoons oil
- 2 tablespoons butter
- 1 onion, chopped
- 1 green pepper, chopped
- 2 carrots, chopped
- 4 cloves garlic, minced
- 2 stalks celery
- Seasoning
- 1 bay leaf
- 2 tablespoons, tomato paste

Procedure

i) Place water in a pan and bring it to boil. Prepare a large bowl with iced water. Throw whole tomatoes in boiling water until you see the skin starting to peel. This may take 1 minute.

ii) Remove the tomatoes, draining off the water. Place them in iced water. Wait until they are cool enough to handle and then remove, peel and squeeze out the seeds.

iii) Chop 8 tomatoes and puree in a blender or food processor or a mortar. Chop remaining two tomatoes and set aside.

iv) In a large pan over medium heat, cook onion, pepper, carrot and garlic in oil and butter until onion starts to soften. This will take you about 5 minutes.

v) Pour in the pureed tomatoes. Stir in the chopped ones and season.

vi) Place bay leaf and whole celery stalks in the pan. Bring to a boil, then reduce heat to low, cover and cook over low heat for one hour.

vii) Stir in tomato paste and allow it to simmer for an additional 30 minutes.

viii) Throw away the bay leaf and celery and serve.

ix) Add flavour and spice.

Figure 7.4: Making tomato sauce

Pickled Beetroot

- Cook the beetroot until tender
- Pack in a container and cover with a mixture of boiling sugar and vinegar mix

Fermented Cabbage

- Shred white head cabbage
- Add salt, crushed garlic, crushed ginger, white pepper, sugar and water

Spicy Pickled Carrots

- Made with fresh, peeled carrots, distilled white vinegar, water, sugar, canning salt, dill seed, garlic cloves and hot pepper flakes
- Pickled mixed vegetables
- Use cauliflower, carrots and red pepper
- Add coriander seeds, mustard seeds, cumin seeds, apple cider vinegar, crushed & peeled garlic, fresh ginger, onion, sugar, salt, black pepper, ground turmeric, crushed red pepper flakes, chopped cauliflower, sliced carrots and diced red pepper

Pickled Cauliflower

- Use cauliflower
- Add coriander seeds, turmeric, cumin seeds, black mustard seeds, bay leaves, carrot, onion, white wine vinegar, sugar and salt

Lemon Spiced Bean Pickle

- Make 3 pints
- Ingredients include green beans (or a 50/50 mix of green and yellow beans), cider vinegar, water, pickling salt, granulated sugar, pickling spice and lemon rind

Sweet Onion Pickles

Use thinly sliced red onions, apple cider vinegar, water, salt, sugar, mustard seed, white pepper and coriander seed, celery seed, cloves and a bay leaf

Savoury Pickled Peppers

Use white vinegar, water, sugar, olive oil, diced onion, diced carrots, peppers, mixed spice and bay leaves

6 pounds medium cucumbers
1 ½ cups sliced onions
2 large garlic cloves, left whole
1/3 cup canning salt
2 trays of ice cubes or crushed ice
4 ½ cups sugar
1 ½ teaspoons turmeric
1 ½ teaspoons celery seed
2 tablespoons mustard seed
3 cups white vinegar

- Wash the cucumbers thoroughly
- drain cut unpeeled cucumbers into 1/4″ slices
- In a large bowl, mix the cucumber slices, onions, garlic, and salt
- cover with the crushed ice, mix thoroughly and let stand for 3 hours
- Drain the liquid and remove the garlic. (I also rinse to get some of the salt off.)
- Combine the sugar, spices, and vinegar and heat just to a boil
- Add the cucumber and onion slices; heat 10 minutes
- Pack loosely in clean, hot pint jars, leaving ½ inch headroom
- Tighten lids; process in boiling water bath for 10 minutes
- Remove and let cool

Activity 7.7: Develop and write a recipe for making a vegetable pickle.

Examples of vegetables that could be pickled include: carrots, radish, onions, potato, egg plants, bitter tomatoes and okra.

Red Tomato Chutney Making

Ingredients

500 gm red tomatoes	1 cloves garlic
1 medium onions	1/2 teaspoon ground ginger
50 gm sugar	200 ml white vinegar

Method

i) Chop vegetables into small pieces
ii) Cook them in a little water until soft
iii) Add vinegar, spices and sugar and cook gently until thick
iv) Bottle in hot sterile jars and cover.

Tomato Sauce

Ingredients

- 10 ripe tomatoes
- 2 tablespoons oil
- 2 tablespoons butter
- 1 onion, chopped
- 1 green paper, chopped
- 2 carrots, chopped
- 4 cloves garlic, minced
- 2 stalks celery
- Seasoning
- 1 bay leaf
- 2 tablespoons, tomato paste

Method

1. Place water in a pan and bring it to boil. Prepare a large bowl with iced water or cold water.
2. Throw whole tomatoes in boiling water until you see the skin starting to peel. This may take 1 minute.
3. Remove the tomatoes, draining off the water. Place them in the iced water or cold water. Wait until they are cool enough to handle and then remove, peel and squeeze out seeds.
4. Chop 8 tomatoes and puree in blender or food processor or a mortar. Chop remaining two tomatoes and set aside.
5. In a large pan over medium heat, cook onion, pepper, carrot and garlic in oil and butter until onion starts to soften. This will take you about 5 minutes.
6. Pour in the pureed tomatoes. Stir in the chopped ones and seasoning

7. Place bay leaf and whole celery stalks in the pan. Bring to a boil, then reduce heat, cover and cook over low heat for 1 hour.
8. Stir in tomato paste and let it simmer for an additional 30 minutes. Throw away the bay leaf and celery and serve.
9. Add flavour and spice.

Chilli Sauce

- ***Ingredients***
- 1 cup red, roughly chopped chilies depending on your heat preference
- 200 g diced tomatoes
- ¼ cup white sugar
- ¼ cup white wine vinegar
- salt to taste

Method

1. Fry the onions
2. Add the bell pepper, garlic and ginger
3. Add the chilies
4. Simmer for about 5 minutes
5. Remove and allow it to cool
6. Pour the cooked mixture into the blender or food processor
7. Blend or process into a purée or sauce consistency
8. Pour back into the pot or pan
9. Combine chilli, tomatoes, sugar, salt and vinegar in a saucepan over high heat. Bring to boil
10. Reduce heat to medium. Simmer, stirring occasionally for 7 minutes or until sauce thickens slightly. Remove from heat. Stand for 5 minutes
11. Process mixture in batches until smooth
12. Pour into hot sterilized jars. Secure lids. Refrigerate for up to 3 week

Mixed vegetable chutney

Ingredients

1 cup chopped tomato pieces
½ teaspoons turmeric powder -
1 Eggplant
1 Potato
1 chopped onion
8 Dry red chillies
1 tablespoons oil

Procedure

1. Boil water in a pan and add tomato pieces, turmeric powder and pieces of eggplant, potato and keep the lid on and boil it until the vegetables are cooked
2. Heat oil and add onion, dry red chillies and sauté it and transfer into the blender and add boiled vegetables, salt and blend it into a paste
3. Check the seasoning and serve

Tomato Marmalade

Ingredients

500 g preserving sugar
550 g firm red or green tomatoes, skinned and sliced
1 lemons, thinly sliced, pips retained
2 tsp root ginger, sliced
½ tsp hot dried chillies
1 tsp lemon peel, diced

Procedure

1. Make syrup by combining the preserving sugar with 250 ml water. Bring to boil and simmer for 10 minutes
2. Wrap the lemon pips, root ginger and chilli in muslin and place in the boiling syrup with the sliced tomatoes and lemons
3. Boil the mixture fast, skimming from time to time until the setting point is achieved. Discard muslin bag
4. Add the diced peel. Stir to combine
5. Put in sterilised jars and cover

Project: Vegetable processing

Processing vegetables into pickles, chutney and sauces and write a project report.

Situation of Integration: Increasing the shelf-life of vegetables

In your community, vegetable growing is common. During the rainy season, most vegetables are not sold because almost everyone has them. As a result, they are left to rot and are simply thrown away.

As a learner in the Nutrition and Food Technology class, what advice would you give to farmers in your community so that wastage is minimized?

Support

You are provided with the following:

1. Extract on vegetable processing
2. Flow charts on processing various vegetables

Tasks

1. Suggest ways in which the farmers could ensure a long shelf-life for their vegetables.
2. Use one of the suggested ways to add value to any vegetable of your choice.

Summary of Chapter 7

In this chapter, you have learned:

i) to process vegetables by drying and using chemicals.
ii) how to crush dried vegetables into a powder.
iii) how to prepare pickles, chutney and sauces.
iv) to package, label and sell the processed vegetables.

Glossary

This glossary defines all the vocabulary terms used at the beginning of each chapter. It also defines a few selected additional terms that are new and are used in the text.

Accident - An unplanned, unexpected, and not purposefully caused event which occurs suddenly and causes injury or loss.

Amino acids - Chemical building blocks that combine to different proteins.

Blanching - This is a cooking process wherein a food, usually a vegetable or fruit, is scalded in boiling water, removed after a brief time interval, and finally plunged into iced water or placed under cold running water (shocking or refreshing) to halt the cooking process.

Caramelisation - the browning of sugar, a process used extensively in cooking for the resulting sweet nutty flavour and brown colour.

Carbohydrates - Nutrients made up of carbon, hydrogen and oxygen. This is the main source of energy for your body.

Chutney - A mixture containing fruit, spices, sugar, and vinegar, eaten cold with especially meat or cheese.

Complete proteins - Proteins that contain all the essential amino acids in the right amounts.

Contamination - To make impure or unsuitable by contact or mixture with something unclean, bad, etc.

Cooking - The practice or skill of preparing food by combining, mixing, and heating ingredients.

Cooling - Refers to a decrease in temperature.

Cross-contamination - Letting harmful bacteria spread from raw foods to other foods.

Crystallization - The process in which crystals are formed either from something that has been melted or from a solution.

Dextrinisation - A kind of browning that occurs when foods containing starch are cooked, or exposed to an alkali, acid or enzyme. Dextrinisation is a chemical change in the starch molecule caused by the breakdown of sugar chains within the molecule.

Diet - The food and drink usually taken by a person or group.

Disaccharides - A disaccharide is a carbohydrate that is formed when two monosaccharides are joined together and a molecule of water is removed from the structure.

Enzymatic - Relating to, or caused by enzymes.

Kitchen equipment - Refers to the items in the kitchen that handle the preparation and cooking processes e.g. stoves, chillers, freezers, microwaves, blenders, knives, peelers, spatulas mixing bowls, and food pans.

First aid - Emergency aid or treatment given to someone injured, became suddenly ill, etc. before regular medical services arrive or can be reached.

Food - Any nourishing substance that is eaten, drunk, or otherwise taken into the body to sustain life, provide energy, promote growth and safety.

Food habits/eating habits - Refers to why and how people eat, which foods they eat, and with whom they eat, as well as the ways people obtain, store, use, and discard food. Individual, social, cultural, religious, economic, environmental, and political factors all influence people's eating habits.

Food poisoning - Is a food borne disease. Ingestion of food that contains a toxin, chemical or infectious agent (like a bacterium, virus, parasite, or prion) may cause adverse symptoms in the body. Those symptoms may be related only to the gastrointestinal tract causing vomiting or diarrhoea or they may involve other organs such as the kidney, brain, or muscle.

Food preservation - Food preservation may be defined as the process of treating and handling food in such a way as to stop, control, or greatly slow down spoilage and, of course, to minimize the possibility of food-borne illness while maintaining the optimum nutritional value, texture, and flavour.

Food processing - Is the transformation of agricultural products into food, or of one form of food into other forms. Food processing includes many forms of processing foods, from grinding grain to make raw flour to home cooking to complex industrial methods used to make convenience foods.

Food technology - Is the application of food science to the selection, preservation, processing, packaging, distribution, and use of safe food.

Gelatinization - Is the process of breaking down the intermolecular bonds of starch molecules in the presence of water and heat, allowing the hydrogen bonding sites (the hydroxyl hydrogen and oxygen) to engage more water. This irreversibly dissolves the starch granule in water. Water acts as a plasticizer. Three main processes happen to the starch granule: granule swelling, crystal or double helical melting, and amylose leaching.

Herbs - Are the leaves, flowers, or stems of plants used in cooking for flavouring or as a garnish to give flavour to particular dishes or in making medicine.

Nutrient imbalances - Nutritional imbalance is caused by inability of the body to absorb certain nutrients or results from a poor diet. Based on the nutrients in short or excess supply, imbalances create unpleasant side effects and conditions that could lead to serious disease. Some levels of macronutrients and micronutrients in your daily diet is needed and some foods you don’t need at all. If you follow a special diet, consult a nutritionist or your healthcare provider to be sure you are getting a full complement of healthy nutrients.

Incomplete proteins - Protein foods that lack one or more of the essential amino acids needed by the body.

Ingredients - Food items that make up a food product.

Kwashiorkor - A malnutrition disease, chiefly in children, caused by severe protein and vitamin deficiency and characterized by retarded growth, changes in pigmentation, potbelly, and anaemia.

Major mineral salts - Minerals needed by the body in large amounts.

Malnutrition - Refers to getting too little or too much of certain nutrients. It can lead to serious health issues, including stunted growth, eye problems, diabetes and heart disease.

Meal - Food served and eaten especially at one of the customary, regular occasions for taking food during the day as breakfast, lunch or supper.

Measuring - To establish the size, amount, or degree of (something) by using an instrument or device marked in standard units.

Mixing - To combine different substances, especially so that the result cannot easily be separated into its parts, or to cause different substances to combine in this way.

Monosaccharides - A simple type of carbohydrate, such as glucose and fructose, formed of molecules that cannot be broken down into any simpler form.

Nutrient - Any substance that plants or animals need in order to live and grow. It is a substance that provides nourishment for growth or metabolism.

Nutrition - The process of taking in food and using it for growth, metabolism, and repair. It is about eating a healthy and balanced diet.

Over nutrition - It refers to excessive food intake especially when viewed as causing adverse health effects.

Protein Energy Malnutrition (PEM) - A form of malnutrition that is defined as a range of pathological conditions arising from coincident lack of dietary protein. It is caused by lack of access to adequate nutrient intake and usually affects children and elderly persons.

Pickles - Vegetables or fruit that have been preserved in a vinegar sauce or salty water.

Polysaccharide - A carbohydrate, a starch, or cellulose containing more than three monosaccharide units per molecule, the units being attached to each other in the manner of acetyl, and therefore, capable of hydrolysis by acids or enzymes to monosaccharides.

Proteins - A type of nutrient that the body uses to build new cells and repair injured ones

Purification - The removal of impure elements from something. Purification is when things are cleaned and made pure. Salt water must undergo purification before it is safe for drinking.

Refuse - Matter thrown away or rejected as worthless. It is something that is discarded as worthless or useless; rubbish; trash; garbage *'heaps of refuse'*.

Sauces - In cooking, a **sauce** is a liquid, cream, or semi-solid food, served on or used in preparing other foods. Most sauces are not normally consumed by themselves; they add

flavour, moisture, and visual appeal to a dish. *Sauce* is a French word taken from the Latin salsa, meaning *salted*.

Solar drying - In sun drying, food is exposed directly to the sunrays. The solar drying method is a process of drying food using indirect solar energy. It is drying at controlled temperatures.

Spices - Is a seed, fruit, root, bark, or other plant substance commonly used for flavouring, colouring or preserving food. Spices are sometimes used in medicine.

Spoilage - The process in which food or other substances stop being good enough to eat or use.

Trace mineral salts - Are those mineral salts present in minimal or very small (milligram or microgram) amounts in the body, which are required for their optimal activity.

Under nutrition - The outcome of insufficient food intake and repeated infectious diseases. It includes being underweight for one's age, too short for one's age (stunted), dangerously thin for one's height (wasted) and deficient in vitamins and minerals (micronutrient malnutrition).

Value addition - It refers to something that you do to improve the quality and prolong life of farm products so that one can earn more money.

Ventilation - The movement of fresh air around a closed space.

Work surfaces - A flat surface, usually in a kitchen, which is easy to clean and on which you can do things such as prepare food.

NCDC
NATIONAL CURRICULUM
DEVELOPMENT CENTRE

National Curriculum
Development Centre,
P.O. Box 7002, Kampala.
www.ncdc.go.ug