THE REPUBLIC OF UGANDA

Ministry of Education and Sports

HOME-STUDY LEARNING

SENIOR 2

FOODS AND NUTRITION

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NCDC
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This material has been developed as a home-study intervention for schools during the lockdown caused by the COVID-19 pandemic to support continuity of learning.

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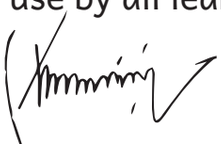
FOREWORD

Following the outbreak of the COVID-19 pandemic, government of Uganda closed all schools and other educational institutions to minimize the spread of the coronavirus. This has affected more than 36,314 primary schools, 3129 secondary schools, 430,778 teachers and 12,777,390 learners.

The COVID-19 outbreak and subsequent closure of all has had drastically impacted on learning especially curriculum coverage, loss of interest in education and learner readiness in case schools open. This could result in massive rates of learner dropouts due to unwanted pregnancies and lack of school fees among others.

To mitigate the impact of the pandemic on the education system in Uganda, the Ministry of Education and Sports (MoES) constituted a Sector Response Taskforce (SRT) to strengthen the sector's preparedness and response measures. The SRT and National Curriculum Development Centre developed print home-study materials, radio and television scripts for some selected subjects for all learners from Pre-Primary to Advanced Level. The materials will enhance continued learning and learning for progression during this period of the lockdown, and will still be relevant when schools resume.

The materials focused on critical competences in all subjects in the curricula to enable the learners to achieve without the teachers' guidance. Therefore effort should be made for all learners to access and use these materials during the lockdown. Similarly, teachers are advised to get these materials in order to plan appropriately for further learning when schools resume, while parents/guardians need to ensure that their children access copies of these materials and use them appropriately.
I recognise the effort of National Curriculum Development Centre in responding to this emergency through appropriate guidance and the timely development of these home study materials. I recommend them for use by all learners during the lockdown.



Alex Kakooza
Permanent Secretary
Ministry of Education and Sports

ACKNOWLEDGEMENTS

National Curriculum Development Centre (NCDC) would like to express its appreciation to all those who worked tirelessly towards the production of home–study materials for Pre-Primary, Primary and Secondary Levels of Education during the COVID-19 lockdown in Uganda.

The Centre appreciates the contribution from all those who guided the development of these materials to make sure they are of quality; Development partners - SESIL, Save the Children and UNICEF; all the Panel members of the various subjects; sister institutions - UNEB and DES for their valuable contributions.

NCDC takes the responsibility for any shortcomings that might be identified in this publication and welcomes suggestions for improvement. The comments and suggestions may be communicated to NCDC through P.O. Box 7002 Kampala or email admin@ncdc.go.ug or by visiting our website at http://ncdc.go.ug/node/13.

Grace K. Baguma
Director,
National Curriculum Development Centre

ABOUT THIS BOOKLET

Dear learner, you are welcome to this home-study package. This content focuses on critical competences in the syllabus.

The content is organised into lesson units. Each unit has lesson activities, summary notes and assessment activities. Some lessons have projects that you need to carry out at home during this period. You are free to use other reference materials to get more information for specific topics.

Seek guidance from people at home who are knowledgeable to clarify in case of a challenge. The knowledge you can acquire from this content can be supplemented with other learning options that may be offered on radio, television, newspaper learning programmes. More learning materials can also be accessed by visiting our website at www.ncdc.go.ug or ncdc-go-ug.digital/. You can access the website using an internet enabled computer or mobile phone.

We encourage you to present your work to your class teacher when schools resume so that your teacher is able to know what you learned during the time you have been away from school. This will form part of your assessment. Your teacher will also assess the assignments you will have done and do corrections where you might not have done it right.

The content has been developed with full awareness of the home learning environment without direct supervision of the teacher. The methods, examples and activities used in the materials have been carefully selected to facilitate continuity of learning.

You are therefore in charge of your own learning. You need to give yourself favourable time for learning. This material can as well be used beyond the home-study situation. Keep it for reference anytime.

Develop your learning timetable to ca ter for continuity of learning and other responsibilities given to you at home.

Enjoy learning

SENIOR TWO

HOME STUDY MATERIAL

NUTRITION AND FOOD TECHNOLOGY

Topic: Methods of Cooking

By the end of this topic, you should be able to;

a) Distinguish between food preparation and cooking.
b) Discover the reasons for cooking**.**
c) Distinguish the different methods of cooking

Lesson 1: Reasons for cooking

Objectives:

In this lesson, you should be able to:

a) Distinguish between food preparation and cooking.

b) Discover the reasons for cooking.

Study requirements you will need

- Time
- A notebook
- A pen
- Images on Food preparation and Cooking.
- Food items

Instructions

As you go through this lesson, there is need to;

- Use the information you have around you about food preparation in consultation with members of your family.

Difference between food preparation and cooking.

Introduction

According to English, the word “to prepare” is used to mean what is done before an activity. “To cook” is to apply heat on food to make it ready for eating. Can you think of the various things that are done before the cooking of food takes place!

We cook food using different methods which are moist and dry as we shall learn later in the forthcoming lessons. The methods of heat transfer vary as well.

Activity 1: Difference between food preparation and cooking.

- Consult the family members about the activities they conduct in both food preparation and cooking.
- Take note of their responses.
- Summarize the differences noted in a table of two columns of food preparation and cooking.

Food Preparation	Cooking

The reasons for cooking.

As an individual, do you commonly take cooked or raw food? There are reasons why may people prefer to cook their food. Let us discover these reasons in this lesson.

Activity 2: Discovering the reasons forcooking.

- Use your own experience and find out why you cook food. Take note of the reasons.
- Ask other family members and discuss with them their reasons for cooking food.
- Write down their responses in your notebook.

Summary

Food preparation and cooking

Food preparation and cooking are essential processes of bringing food to table.

Cooking is the application of heat on food. It involves many methods both dry and moist and the use of kitchen equipment. There is a combination of ingredients to change flavour, appearance and digestibility of food.

Food preparation involves all activities done before cooking. These include washing, selection, sorting, collection of equipment and ingredients, making of a fire place among others.

Reasons for cooking Food

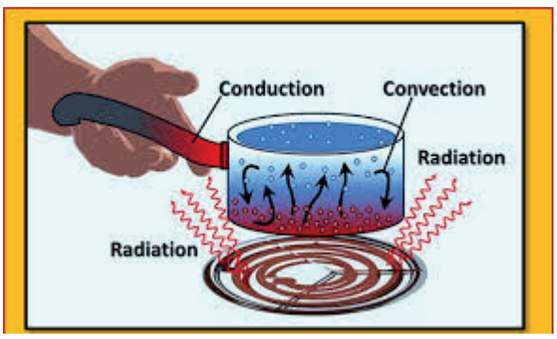
- Applying heat to food can transform it physically and chemically. It changes its flavour, texture, consistency, appearance, taste and nutritional properties.
- Cooking makes the food easy to chew.
- Cooking softens the connective tissues in the meat and makes animal foods more digestible.
- Cooking makes the complex foods split into simplersubstances.
- Cooking helps to kill germs. It makes the food safe to eat.
- Cooking preserves the food.
- A wide variety of dishes can be made by different methods of cooking suchas boiling, frying, roasting, microwaving, baking, smoking, etc.
- Cooking turns the food to appreciable texture.
- Cooking makes food more appetizing.

Glossary/Key words

- Food preparation
- Cooking
- Heat
- Raw
- Flavour
- Ingredients
- Spices

Hopefully you had a wonderful lesson. Enjoy the art of cooking.

Topic: Heat Transfer



Lesson 1:

Methods of Heat Transfer

Learning objectives: by the end of this lesson you should be able to

a) Describe the mode of heat transfer during cooking

Study requirements

Note book heat source kettle fire wood

Pen saucepan plate

Pencil water an egg

Introduction

Have you cooked before? Have you observed how the saucepan or kettle gains heat with time?

You will realise that heat naturally move from hot surfaces to cooler surfaces. The movement of heat is commonly known as heat transfer. The three modes of heat transfer are conduction, convection and radiation.

Activity 1: Transfer of heat by conduction and convection

1. Have the following: heat source, saucepan, one litre of water, an egg
2. Put the saucepan on to the heat source for about 5 minutes
3. Touch for a few seconds and observe
4. Record what you have felt and seen.
5. Pour the water into the pan, put in the egg and let it boil for 5 minutes
6. Observe what has happened and record your findings.

Activity 2: Transfer of heat by radiation

1. Setup a fire using firewood.
2. Place a kettle of water in one of the sides in a distance of about 60 Observe and record what happens to the kettle.

Summary

Conduction is a means of transferring heat through a solid object by contact e.g. metals used for saucepans. These receive the heat from charcoal stoves, gas cooker, solid electric hot plate or firewood.

Convection can be seen in the boiling of water. Convection involves movement of heated particles of gases and liquids as a medium of heat exchange. On heating, the particles expand, become less dense and rise. The colder particles sink to take their place, thus causing convection currents which distribute heat. Methods of cooking like boiling, stewing, braising, poaching and baking depend on this mode of heat transfer.

Radiation is when heat passes from its source in direct rays until it falls on an object in its path. Radiation does not require any medium (water or gas). It takes place in a vacuum (empty space).

For example, you can warm your hands using an open fire. Grilling and microwaving also uses this method of heat transfer.

Key words

Convection

Conduction

Radiation

Medium

.

Moist methods of cooking

Lesson 1: Poaching

Lesson objectives: by the end of this lesson you should be able to

a) Explain the principles involved in poaching

Study requirements

- Pen and note book
- Kitchen equipment
- Ingredients
- Heat source

Introduction

As the name suggests moist, these are methods in which the food is cooked by steam or water (liquid). These methods include boiling, steaming, stewing, poaching and braising.
Different cooking methods suit different kinds of foods. For example, some meats are high in connective tissue and will be tough unless the tissue is broken down slowly by moist heat. Other meats are low in connective tissue and are naturally tender

Activity 1: Poaching

Requirements: frying pan, draining spoon, source of heat
Ingredients: an egg, pinch of salt and pepper, 125mls of water, 1 tea spoon of vinegar

1. Put a frying pan on a source of heat
2. Put 125mls of water into the pan
3. Add a pinch of salt and 1 tea spoon of vinegar to the water.
4. Allow it boil
5. Gently break an egg into the water and let it cook for 3-5minutes. Note that the water should not cover the egg.
6. Using a table spoon keep pouring a little of that cooking water over the egg ensuring it does not break.
7. Remove the egg using a draining spoon on to a plate.
8. Sprinkle with a little pepper and serve.
9. Note down the principles followed in the making of the dish.

Summary

Poaching is a moist method of cooking by submerging food in some kind of liquid and heating at a low temperature. The liquids that can be used in poaching are boiling water, white vinegar, red wine, milk, stock, butter and lemon juice. Poaching works by allowing the proteins in the food to break down without pulling moisture out of the food. Because poaching uses a temperature that is even lower than simmering, it is important to keep the heat low and to keep the poaching time to a bare minimum, which helps preserve the flavour and structure of the food. Poaching is used to cooking delicate foods like fish and eggs. It is also used to partially cook variety meats to get rid of odours and undesirable flavours which can be eliminated by poaching and which will make the product firm before the actual cooking.

Glossary

Poaching

Simmering

Lesson 2: Simmering and Boiling

Objectives:

By the end of the lesson you will be able to

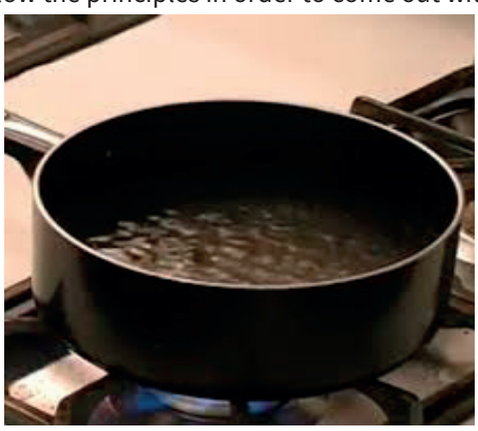
a) Distinguish between simmering and boiling
b) Explain the principles involved insimmering and boiling

Study requirements

- Time
- Note book and pen
- Heat source
- Saucepan
- Ingredients as in the recipe below

Instructions

As you go through this lesson there is need to practice the skill gained in simmering and boiling. Follow the principles in order to come out with a good product.



Introduction

When you are cooking groundnut sauce, what process do you do after they have boiled still on fire and not yet served? Many at times simmering and boiling are interchanged. For simmering to take place, the cooking should be below the boiling point. Boiling refers to cooking in a very hot liquid that is bubbling rapidly. You have done boiling of a food item before at home. What special procedures were involved?

Activity 1. Principle of Boiling

Requirements: a saucepan, saucepan lid/ banana / aluminium foil.

Ingredients: two tuber of sweet potatoes / cassava, 2 cups of water

1. Peel and wash the potatoes/cassava
2. Boil the water.
3. Put in the potatoes/cassava into the boiling water and cover tightly with a lid/banana leave/aluminium foil.
4. Boil for about 20 minutes until soft.
5. Drain the water out and serve the potatoes/ cassava on a plate.
6. Write down your observations and principles followed in the preparation of the dish.

Summary

Blanching is where vegetables or fruits are scalded in boiling water for a brief time interval and finally placed in cold water to halt the process. This helps to reduce nutrient loss. Simmering is the use of gentle heat treatment which causes small bubbles to rise slowly from the liquid. The food remains whole, with a better texture and tenderer. The water does not evaporate so quickly and less vigilance is required to maintain the correct level of a liquid. Before food is introduced to simmer the liquid should first be brought to boil to compensate for the loss in temperature.

Parboiling is the boiling of food until it is only partially cooked. The food is placed in boiling water for a short time from 1 to 5 minutes, or until the outside becomes soft. The cooking process is then completed using another method such as frying and roasting. Potatoes, for example, maybe parboiled to reduce roasting time and to help brown them and give a crisper texture.

Principles to follow during boiling

1. The boiling utensil should be matched with the quantity of food to be cooked. If not enough space is available water will spill as it boils.
2. The food handler should take care when placing foods into or removing items from, boiling liquids.
3. When reducing liquids adequate ventilation should be available to remove steam from the atmosphere. Condensation can cause slippery floors and dampness on electrical appliances.
4. It does not matter how high the burner is turned, the temperature of the liquid will go no higher while boiling.
5. Cover the pan with a tight fitting lid to reduce evaporation and maintain temperature.
6. Bring water to boil before putting in food to boil except eggs.
7. Use little water to minimise loss of nutrients

Glossary
Boiling
Simmering
Parboiling
Blanching

Lesson 3: Steaming

Lesson objectives: by the end of the lesson you will be able to

a) Explain the principles involved in steaming

Study requirements

- Notebook
- Pen
- Saucepan /Steamer
- Lid
- Source of heat
- Ingredients.

Principles of Steaming

Introduction

To steam means to cook food in a covered pan by exposing them to steam (hot vapour from boiling water). Have you used this method of cooking before? Which foods did you cook? Steaming can also be done on a rack above boiling water.

Activity 1: Principle of Steaming

- Practice the skill of steaming a carbohydrate food that is accessible at home.

Requirements; Source of heat, Saucepan, lid (banana leaves, banana stalks) Steamer

Ingredients

- 6 fingers of matooke/ cassava/sweet potatoes/ maize etc
- Water

Procedure

- Peel and wash the food
- Light the fire source and if ready, put a kettle of water.
- Prepare the saucepan by putting in banana stalks/ sticks/ or as improvised at home. This works as a base such that food does not get into direct contact to the pan and water.
- Wrap the food into the banana leaves, and place it into the pan over base, where pieces of banana leaves have also been placed.
- Cover the food within the pan tightly too minimise steam escape during the cooking.
- Put in the hot water into the saucepan and place it on to the heat source.
- Allow it to cook until ready for about 45 minutes.
- When ready, serve.

Note down the principles involved in the procedures carried out.

Summary

Steaming is widely used for vegetables. It cooks them rapidly without agitation and minimizes the nutrient, colour and flavour loss normally associated with boiling.

Rules for steaming

- Use of correct quantities of water that will not overflow when it boils.
- Put water to boil before preparing for food to be steamed.
- The water must be boiling briskly when food is put to steam so that food will cook at right temperatures
- Cover the food with greased proof paper or any wrapping like banana leaves to prevent any method contact with water vapour.
- The steamer must have a tight fitting lid
- Check the water to maintain the same temperature.
- Be careful when removing the lid and avoid burning.
- When the water level has reduced, use boiling water to maintain the same temperatures.

Glossary

- Steaming
- Steamer
- Briskly

References

- Foods and Nutrition by Anita Tull.
- Foods and Nutrition by Deidre Madden
- O-level Cookery by P.M Abbey.

Lesson 4: Braising

Lesson objectives: by the end of the lesson you will be able to

a) Explain the principles involved in braising

Study requirements

- Pen and note book
- Time
- Saucepan
- Ingredients
- Source of heat

Introduction

You will discover that braising is a combination cooking methods that uses both wet and dry heats. The food is first sautéed or browned at a high temperature, then finished in a covered saucepan/in an oven at a lower temperature.

Activity 1. Principles of Braising

Requirements: casserole, oven, saucepan, ladle, heavy pan with lid

Ingredients :1/2 cup rice, 1 cup of boiling water/ stock, 1 teaspoon salt, 2 table spoon oil/fat, 2 onions, 1 green pepper, 1 carrot,

Procedure

1. Preheat the oven to 170^0C.
2. Heat the oil/fat in the heavy pan over medium heat. Once hot add the chopped onions and cook for several minutes till soft and translucent.
3. Add the rice and salt; cook further for some minutes before adding stock or water.
4. Add the stock and vegetables, bring to boil and cover with a lid. Then transfer to the oven and cook for 15- 20 minutes.
5. Serve on a plate.

Note down the principles involved in the procedures carried out.

Summary

Braising refers to cooking food in a small amount of liquid, generally after preliminary browning. Then cooking is done on a bed of vegetables and most often, the liquid used for the cooking is served with the foodstuff as a sauce.

Guidelines for braising

1. Braised meats are usually browned first using a dry heat technique like frying. This offers a fascinating look and colour and flavour to the product and to the sauce.

2.The browned meat/food is placed on top of the mirepoix (prepared vegetables and herbs). Stock is added half way up the meat.

3. The meat or any other food, which cooks in the steam, should be basted frequently with the hot liquid.

4. The lid of the saucepan must fit tightly to prevent evaporation. Simmer until tender.

Glossary

- Braising
- Mirepoix
- Stock
- Basting

Lesson 5: Stewing

Objective:
By the end of the lesson you will be able to

a) Explain the principles involved in stewing

Study requirements:

- Pen and note book
- Saucepan
- Ingredients for stewing
- Source of heat
- Time

Introduction

What is the commonest way of preparing sauces at home? Stewing is a long, slow cooking method where food is cut into pieces and cooked in the minimum amount of liquid, water, stock or sauce. The food and the cooking liquid are served together.

Have you heard of this saying, “A stew boiled is a stew spoiled”? Can you think of foods that can be stewed?

Activity 1: Principles of stewing

- Practice the skill of stewing a protein or vegetable food that is accessible at home

Meat stew

Requirements: heat source, saucepan, ladle

Ingredients: ½ kg beef, 2 onions, 3 tomatoes, 2-3 tablespoons cooking oil, 2 teaspoons salt, 1 teaspoon curry powder, 3 carrots, 2 green peppers

Procedure

1. Cut the meat into small pieces and remove the excess fat.
2. Chop the onions, skin the tomatoes and cut into pieces
3. Clean and cut the vegetables.
4. Heat the oil and fry the onions till golden brown.
5. Add the tomatoes, curry powder and cook till well done.
6. Put in the meat and cook till it dries and the meat is almost brown.
7. Add in the vegetables.
8. Add warm water and bring to the boil in a covered pan.
9. Reduce heat and simmer for about one hour till the meat is tender.
10. Serve with any preferred food.

Bean stew

Ingredients: 1 cup of fresh beans, 1 big onion, 1teaspoon salt, 2 big tomatoes, ½ teaspoon curry powder, 2 tablespoons cooking oil

Procedure

1. Boil the beans until tender.
2. Chop the onions and cut the blanched skinned tomatoes.
3. Heat the oil , fry the onions , add curry powder and vegetables
4. Cook over heat for three to five minutes.
5. Drain water from the beans.
6. Add the beans to the cooking vegetables and cook while stirring to avoid burning.
7. Add the water which was drained from the beans and let it simmer for a few minutes.
8. Serve with desired staple food.

Summary

Guide lines to stewing

To stew means to cook items of meat or fish or vegetables using fairly large amounts of liquids.
1. The food is cut into little cubes. Tougher cuts of meat are best cooked by this technique.
2. The liquid is generally at simmering point and is enough to only cover the whole foodstuff.
3. In stewing, a lot of the nutrients and flavour is transferred to the liquid. Therefore, it's an ideal method of producing appetising dishes from the cheaper, tougher cuts of meat.
4. Cooking must be slow in order to give time for the connective tissue in tough meat to be changed into soluble gelatine, so releasing the fibres and making the meat tender.

Glossary

Stewing
Simmering
Blanching
Skinning

Topic: Dry methods of Cooking

By the end of this topic, you should be able to;

a) Explain the principles involved in using the dry methods of cooking.

Lesson 1: Baking

Objectives:

In this lesson, you should be able to:

b) a) Explain the principles involved in Baking.

Study requirements you will need

- Time
- A notebook
- A pen
- Oven(gas, charcoal, electric, locally made)
- Ingredients for baking(flour, eggs, fat, sugar, flavouring)

Instructions

As you go through this lesson, there is need to;

- Practice the skill of baking and make a complete product of your own choice, following the correct guidelines.

Principles in Baking


Introduction

What do you think baking is? Baking is a cooking method that is favourite to many people. For baking to take place, there must be a medium of hot air in an enclosed equipment. Today, having a good cake is one of everyone desire for their occasion, How about you? You need to observe the principles involved in order to come up with good products. Knowing your oven and how it works is very important whether it uses charcoal, firewood, gas or electricity such that you maintain the correct temperatures.

In this lesson, you will be able to bake a cake, bread, cookies, or fish as you practice.

If you do not have a constructed oven, you can improvise one using the guidelines below;

An improvised oven on top of a charcoal stove

Requirements

- Charcoal stove
- Charcoal
- Large saucepan
- Smaller saucepan
- Fitting lid to the large pan
- Sand/ Ash

Steps

- Light a charcoal stove
- Put sand within the large pan and cover it.
- Place it over the charcoal stove and allow it to heat up.
- When hot enough to the right temperature, it should be hot for your hand not to sustain after being put in for 1 minute.
- If it is ready, then you can sit in the baking pan with the cake and cover.

Activity 1: Baking.

- Using an electric, gas, charcoal, firewood oven or locally improvised oven
- Follow the following procedures to bake a cake.

Ingredients for a Vanilla cake

- 250g fat
- 150 g sugar
- 7 eggs
- 300g flour
- 1 lemon
- 2 level teaspoons baking powder
- 1 teaspoon vanilla essence

Procedure

- Cream fat and sugar until creamy white, light and fluffy.
- Add eggs little at a time as you cream.
- If it curdles (separating into small droplets), sprinkle a little flour.
- Add in the vanilla essence.
- Grate lemon peels thinly and squeeze juice out of the lemon.
- Add both to the mixture.
- Fold in all the remaining flour.
- Grease the baking pan and pour in the cake mixture to be put in the oven.
- Place it in the oven ensuring that the temperature is well regulated.

Other products can be baked following the respective procedures as in the recipe books.

Activity 2: Principles involved in Baking

- After the baking process, analyze the special points that were considered during baking.
- Take note of them in your book.

Summary

Baking

This is a method of cooking food in hot air in an oven. The upper point of the oven is usually hotter than the lower point. The medium shelf is the best for baking.

Principles involved in baking

- Place the oven racks in the positions required before lighting the oven.
- Pre-heat oven 15minutes before food is put in.
- Set the oven to the required temperatures
- Make sure that the oven is clean and dry.
- Always know the baking period to avoid under baking or burning.
- When the crusts turn slightly brown, the temperature should be lowered to enable it cook properly.
- Do not open the oven door too often during baking or otherwise the cake will sink in the centre.

Glossary/Key words

- Baking
- Oven
- Ingredients

References

- Foods and Nutrition by Barbara Hammond
- Foods and Nutrition by Deidre Madden
- Self-study materials
- Internet
- Oral literature
- Recipe book

Stay blessed. Enjoy the art of cooking.

Lesson 2: Grilling

Objectives:

In this lesson, you should be able to:

a) Explain the principles involved in Grilling.

Study requirements you will need

- Time
- A notebook
- A pen
- Grill
- Ingredients for grilling

Principles in Grilling

Introduction

Grilling as a method of cooking is very suitable for tender pieces, and there is need to brush your food with some oil to prevent it from drying up. Have you used this method before?

In this lesson, I hope you should be able to try it out. It uses radiant heat which moves through an empty space, and not any medium. Foods are also marinated to have a very good flavour.

Activity 1: Principles of Grilling

Using any one of the available equipment below, grill a food product.

- An electric grill
- A charcoal stove
- A gas grill

Ingredients for Grilled meat kebabs

- 250g lean meat (pork, goats, meat or beef).
- 1 large onion
- 1 green pepper
- 1 clove garlic (crushed)
- 1 top of vinegar
- 3 teaspoons soy sauce
- 2 tablespoons chopped cot mill (Dania, coriander).
- 4 tomatoes
- 4 tablespoons of oil
- Shredded lettuce
- Orange or lemon slices
- Salt to taste.

Method

1. **Make a marinade of a mixture of (soy sauce, cot mill, salt, onion, vinegar, crushed garlic).**
2. Add cubes of meat to the marinade and mix thoroughly. Leave to stand for about 30 minutes in a cool place.
3. Cut onions into quarters and separate the layers.
4. Chop the tomatoes into quarters.
5. Cut the green pepper into small squares while removing the seeds.
6. Put pieces of meat, onions, pepper and tomatoes interchangeably on to skewers.
7. Heat the grill equipment to be used.
8. Grill while turning from time to time, baste (brush with some oil on food) with some oil if it tends to turn too dry until meat is thoroughly cooked.
9. Serve on a bed of shredded lettuce garnished with lemon or orange slices.

Other products can be grilled following the respective procedures as in the recipe books.

- After the grilling process, analyze the special points that were considered during grilling.
- Take note of them in your book.

Summary

Grilling

This is a quick method of cooking by which food is cooked under radiant heat. It is suitable for tender cuts of meat e.g. liver.

Broiling is sometimes used to mean grilling. It is another dry heat cooking method that relies on heat being conducted through the air. Because air is a relatively poor conductor of heat, broiling, and grilling require the food to be quite close to the heat source, which in this case is likely to be an open flame. Thus the surface of the food cooks very quickly, making this type of cooking ideal for poultry, fish and the tenderest cuts of meat.

There is one significant distinction between broiling and grilling: **Grilling involves** heating the food from below, while broiling involves heating from above. In both cases, the food is typically turned once during cooking, and a grid or grate of some kind can be used, giving the food the distinctive grill-marks that are the main characteristicof this cooking technique.

As with sautéing, it's critical to heat the broiler or grill before adding the food.

Guidelines for grilling

- Pre heat the grill
- Seasoning is with pepper only as salt causes the juices to run out.
- Never turn the food with a pointed instrument as it pricks food causing juices to run out.
- Use tender and thin pieces of food.
- Marinate meat before cooking to improve on the flavour and tenderness.

Marinating*:* this is the soaking of meat in a mixture of oil, acid, herbs and seasoning such as chopped onions, carrots etc.

The meat is left to stand and is turned often; this improves the flavours and moisture and also tenderizes it as the acid present softens the meat fibre.

Glossary/Key words

- Seasoning
- Basting

References

- Foods and Nutrition by Barbara Hammond
- Foods and Nutrition by Deidre Madden
- Self-study materials
- Internet
- Oral literature
- Recipe book

Stay blessed.Enjoy the grill.

Lesson 3: Roasting

Objectives:

In this lesson, you should be able to:

c) a) Explain the principles involved in Roasting.

Study requirements you will need

- Time
- A notebook
- A pen
- Oven(gas, charcoal, electric, locally made)
- Ingredients for roasting

Principles in roasting

Introduction

The experience that is common to many of us when we talk about roasting is that of roasted meat that is usually served at parties. Is it roasting or grilling method that is used? You will be able to better describe these methods by the end of the lesson.

The words roasting and baking both describe a method of cooking an item by enveloping it in hot, dry air. This typically happens inside an oven and at usually high temperature. What other information have you heard about roasting?

This technique cooks food fairly evenly since all of the food's surfaces are exposed to heat. Roasting and baking both require that the food be cooked uncovered when used as a dry heat cooking method so that it's the hot, dry air that delivers the heat, not the steam from the food.

Activity 1: Principle of roasting

- Describe the principles involved in roasting by preparing a roasted dish

Ingredients for Roasted Beef/chicken

- 500g tender cut of beef /chicken
- 1 teaspoon plain flour
- 1 teaspoon mustard powder
- 1onion
- 1 teaspoon curry powder
- Pinch of nutmeg
- 1 clove garlic
- 2 tablespoons choppedcotmill
- ¼ teaspoon black pepper
- 3 teaspoons soy sauce.
- Salt totaste.

Procedure

1. Mix the flour and mustard powder, chopped onions, garlic, soy sauce with the seasonings, then rub all over the beef and leave in a cool place for about 30minutes.
2. Put the beef in an oiled roasting tin, and then roast for 20 minutes in a hotoven
3. Reduce the temperature in the oven and continue to cook the beef for 1 hour for it to be welldone.
4. Keep basting with hot fat as you roast yourmeat.
5. When ready, it will have browned.

Other products can be roasted following the respective procedures as in the recipe books.

- After the roasting process, analyze the guidelines that were considered during roasting.
- Take note of them in your book.

Summary

Roasting;

This is a method of cooking food near an intense source of heat. It can be done in an oven.

Guidelines involved in roasting

- Preheat the oven.
- Baste the food continuously to prevent it from drying.
- Allow food to cook before serving.
- Prepare food near serving time

Glossary/Key words

- Roasting
- preheating
- Oven
- Basting

References

Foods and Nutrition by Barbara Hammond

- Foods and Nutrition by Deidre Madden
- Self-study materials
- Internet
- Oral literature
- Recipe book

Have a good time.

Lesson 4: Frying

Objectives:

In this lesson, you should be able to:

a) Explain the principles involved in Frying.

Study requirements you will need

- Time
- A notebook
- A pen
- Frying pan
- Oil
- Ingredients for frying

Principles in frying

Introduction

Activity 1: Principle of frying

- Describe the principles involved in frying by preparing a fried dish

Ingredients for Deep fried Irish potatoes

- 10 medium sized Irish potatoes
- 1 /2 liter of cooking oil

- 3 cloves of garlic
- 1 medium sized onion
- 1 teaspoon of curry powder
- 1/2 tablespoon of crushed cot mill
- ½ teaspoon of salt

Procedure

1. Parboil the Irish potatoes with all the ingredients until undercooked.
2. Drain them out of the water.
3. Heat the oil until ready
4. Place in the Irish potatoes gently and fry until golden brown.
5. Drain them out when ready
6. Place on paper to drain out the excess oil.

Other products can be fried following the respective procedures as in the recipe books.

- After the frying process, analyze the guidelines that were considered during frying.
- Take note of them in your book.

Summary

Frying

Frying; this is cooking food in hot oil and it is a quick method of cooking food as fats and oils are heated to high temperatures without burning.

Types of frying:

1. Dry frying: no fat is used. It is suitable for foods which contain sufficient oil such as fatty meat, bacon, sausage etc., adding a little fat may make these foods greasy and unappetizing.

2. Stir frying/sautéing: a small amount of oil is used, the food is cooked very quickly in hot oil, a little liquid may be added the oil is absorbed by the food and served together as ingredients in the dish such as stir fried cabbages.

3. Shallow frying: The oil just covers the bottom of frying pan and should be just enough to reach halfway up the food to be cooked, frying the food on one side until golden brown before turning over side e.g. burgers, fried fish, fish cakes, etc.

4. Deep frying: the food is completely immersed in hot oil in a deep frying pan together. Suitable foods include; mandazi, samosas,potato crisps,doughnuts, fish fillet,chicken, etc.

Guidelines involved in frying

1. Dry and clean all utensils as water causes oil to splutter.
2. Drain the food before placing it to prevent the oil from spluttering.
3. Fill half way, too much oil will bubble over and cause fire.
4. Heat oil until it gives off a haze before putting in the food. Cold oil will make the food soggy.
5. Slide the food in gently to prevent oil from splashing.
6. Do not put in too much food at a time as this will cool down the oil and make food soggy.

7. Coat food especially soft protein foods with seasoned flour/bread crumbs, eggs to get even colour and preserve nutrients.
8. Drain food when it is removed from oil to prevent it from becoming soggy.
9. Do not add oil while food is being fried, it will cool down the oil and make food soggy.

Summary

Dry heat cooking methods refer to any cooking technique where the heat is transferred to the food item without using extra moisture. This method typically involves high temperatures.

Glossary/Key words

- Deep frying
- Shallow frying
- Parboiling
- Haze

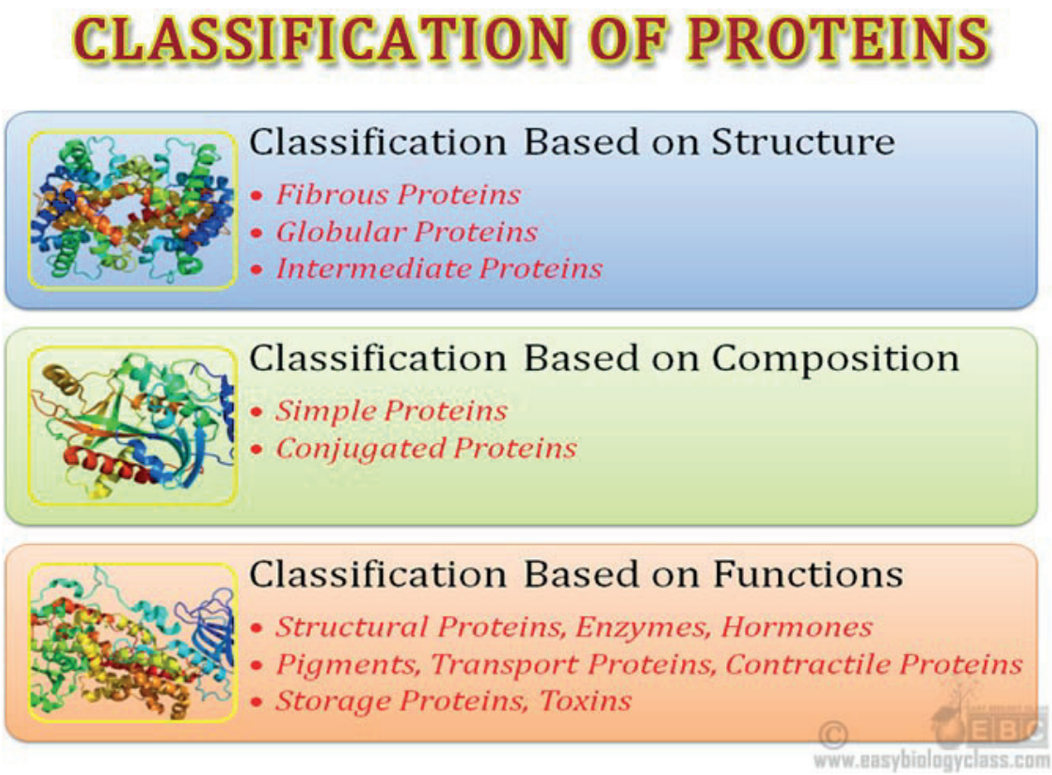
References

- Foods and Nutrition by Barbara Hammond
- Foods and Nutrition by Deidre Madden
- Self-study materials
- Internet
- Oral literature
- Recipe book

Hope you had a good lesson. Continue practising frying at home.

Topic: Proteins

Lesson 1



Learning objectives: by the end of this lesson you able should be able to

a) Classify the proteins

Study requirements – time, pen and notebook

Introduction

Your body needs proteins because they are essential to life. All living cells are built up of protoplasm which consist of protein. Proteins are made up of the following elements carbon, hydrogen, oxygen , nitrogen and sulphur. Amino acids are the simpler substances that make up proteins.

Proteins are classified in the following categories

- Classification based on structure of protein. For instance, the skin and hair as example of a body structure that has fibrous proteins which are characterised by being linear, tough, and strong, forms long fibres and are insoluble in water.
- Classification based on biological value which involves composition of protein. They are some which contain all the essential amino acids and are highly nourishing also known as complete / first class proteins. Those that lack one or more essential amino acids are known as incomplete / second class proteins
- Classification based on functions.
  There those that work as enzymes, hormones, structures, and storage sites.

Activity 1. Classification of proteins

Research and Discuss with your peers or family members the examples of proteins and their food sources in the respective classifications in the table below.

classifications	Example of protein	Source of protein
According to structure Fibrous Globular Conjugated	…… …….. ……..	…….. …… ……..
According to Biological Value High Biological value Low biological value	…….. ……	…… ……..

Summary

The proteins are classified into categories based on different criterion. They are classified based on structure; where we have fibrous, globular and intermediate. The classification based on composition where we have simple and conjugated. They are also classified based on functions which include structural, enzymes, hormones, respiratory pigments, transport, contractile and storage.

Glossary

Fibrous proteins

Globular proteins

Intermediate proteins

Structural proteins

Conjugated proteins

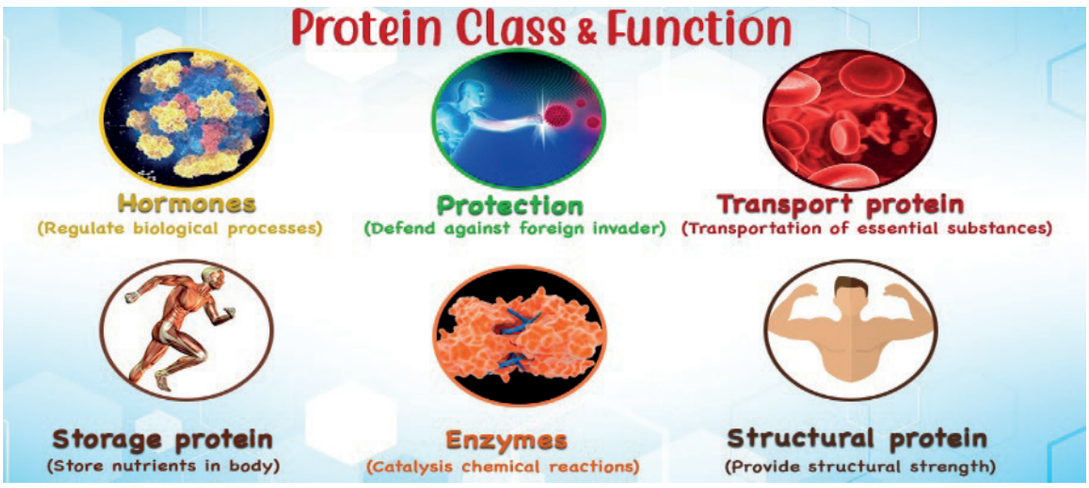
Amino acid

Protoplasm

References

Foods and Nutrition by B. Hammond
O' level cookery by P.M. Abbey

Lesson 2: Functions of Proteins and their effects of deficiency



Learning objective: by the end of this lesson you should be able to

a) explain the functions and effects of protein deficiency

Study requirements

Pen and note book

Introduction

Why do you think proteins are essential to our bodies? Have you ever seen a child who malnourished?

Protein is an important substance found in every cell in the human body. Proteins are made up of many building blocks, known as amino acids for the growth and maintenance of our cells and tissues Protein is manufactured by your body utilizing the dietary protein you consume. It is used in many vital processes and thus needs to be consistently replaced. You can accomplish this by regularly consuming foods that contain protein. Our dietary protein requirements changes throughout our life.

Protein deficiency is also known as protein-energy malnutrition (PEM). When PEM is caused primarily by protein malnutrition, it's called kwashiorkor. When significant protein deficiency is coupled with marked calorie restriction, it's referred to as marasmic kwashiorkor, the most extreme form of malnutrition.

Activity 1: Functions of proteins and effects of protein deficiency

a. Use your phone to find out the functions of proteins and write them down in your note book.

b. Look around in your community and find out if there are children with signs and symptoms of malnutrition. Write down in your note book how best you are going to help them prevent and treat the condition.

Summary

Protein is essential for life; it supplies the essential amino acids needed for the growth and maintenance of our cells and tissues. Our requirement for protein depends on our stage of life. As we eat foods and not nutrients, we should choose protein-rich foods that not only provide essential amino acids but also support a healthy and sustainable diet.

The functions of protein are as follows:

Repair and Maintenance

Protein is vital in the maintenance of body tissue, including development and repair. Hair, skin, eyes, muscles and organs are all made from protein. This is why children need more protein per pound of body weight than adults; they are growing and developing new protein tissue.

Energy

Protein is a major source of energy. If you consume more protein than you need for body tissue maintenance and other necessary functions, your body will use it for energy. If it is not needed due to sufficient intake of other energy sources such as carbohydrates, the protein will be used to create fat and becomes part of fat cells.

Hormones

Protein is involved in the creation of some hormones. These substances help control body functions that involve the interaction of several organs.

Enzymes

Enzymes are proteins that increase the rate of chemical reactions in the body. In fact, most of the necessary chemical reactions in the body would not efficiently proceed without enzymes.

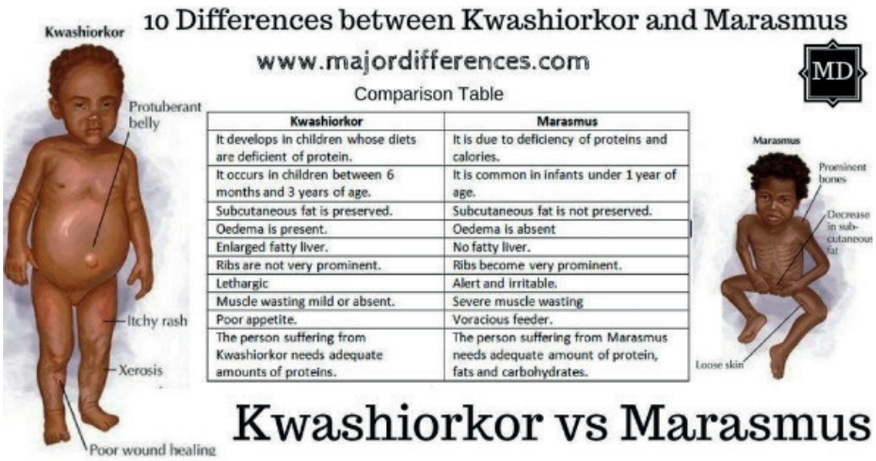
Transportation and Storage of Molecules

Protein is a major element in transportation of certain molecules. For example, haemoglobin is a protein that transports oxygen throughout the body. Protein is also sometimes used to store certain molecules.

Antibodies

Protein forms antibodies that help prevent infection, illness and disease. These proteins identify and assist in destroying antigens such as bacteria and viruses. They often work in conjunction with the other immune system cells.

Effects of protein deficiency



Kwashiorkor	Marasmus
It develops in children whose diets are deficient of protein.	It is due to deficiency of proteins and calories.
It occurs in children between 6 months and 3 years of age.	It is common in infants under 1 year of age.
Subcutaneous fat is preserved.	Subcutaneous fat is not preserved.
Oedema is present.	Oedema is absent
Enlarged fatty liver.	No fatty liver.
Ribs are not very prominent.	Ribs become very prominent.
Lethargic	Alert and irritable.
Muscle wasting mild or absent.	Severe muscle wasting
Poor appetite.	Voracious feeder.
The person suffering from Kwashiorkor needs adequate amounts of proteins.	The person suffering from Marasmus needs adequate amount of protein, fats and carbohydrates.

When protein is lacking in your diet, especially for long periods of time, it can lead to deficiency diseases and potentially lead to adverse effects. Inadequate protein can lead to the following:

- **Muscle Wasting** – Insufficient protein in your diet reduces lean body mass, muscle strength, and function.
- **Poor Wound Healing** – Protein deficiency has shown to contribute to low wound healing rates and reduced collagen formation.
- **Infections** – Protein deficiency is indicated to impair your immune system. Without a healthy immune system, your risk of infection is increased and the ability to fight off infection is decreased. [6]

Glossary

Kwashiorkor, Marasmus, Marasmickwashoikor, Muscle wasting, Protein energy malnutrition, Deficiency, Calorific

References

Foods and Nutrition by B. Hammond
O' level cookery by P.M. Abbey
Foods and nutrition by D. Madden

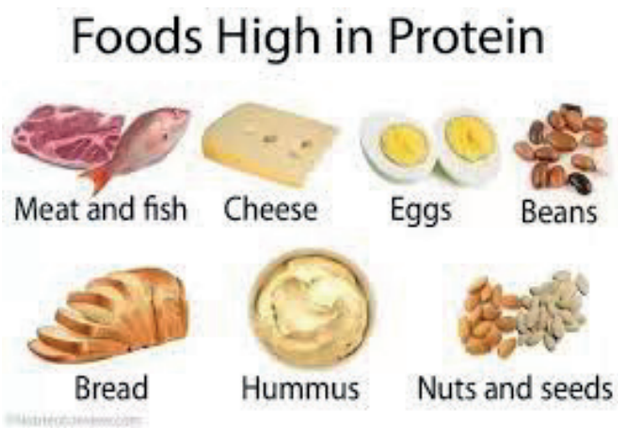
Lesson 3: Sources and properties of Proteins

Learning objective: by the end of this lesson you should be able to

a) List the sources of proteins
b) Discover the properties of protein

Study requirements

- Note book and pen



Introduction

Proteinis one of the essential nutrient in the human diet. When you eat foods that contain amino acids it makes it possible for your body to create protein. There are nine essential amino acids that the human body does not synthesize, so they must come from the diet. Foods that contain these nine essential acids are called complete proteins or 1st class proteins and these are mainly animal sources such as milk, meat and eggs except for soya bean which is a plant protein.

Proteins which are deficient in one or more essential are known as incomplete proteins.These are also called incompleteor 2nd class proteins and a usually from vegetable sources.

Protein do have both physical and chemical properties that are influenced by their structure and elements they contain.

Activity 1: Source of proteins

1. Draw a table showing both the animal and plant proteins you have eaten in the last four days indicating the protein percentage.

Activity 2: Properties of protein.

For this activity you need to note down whatever you observein your note book.

Materials required

- Eggs
- Fork /whisk
- Plate/small bowl
- Frying pan/ saucepan
- ½ cup of milk
- Lemon juice/tomato juice/ vinegar
- 1 teaspoon cooking oil
- Source of heat (charcoal stove, fireplace, gas cooker, electric cooker)

Procedure

Step 1: Break the egg on the plate / small bowl and beat/ whisk with a folk or whisk.

What do you observe?

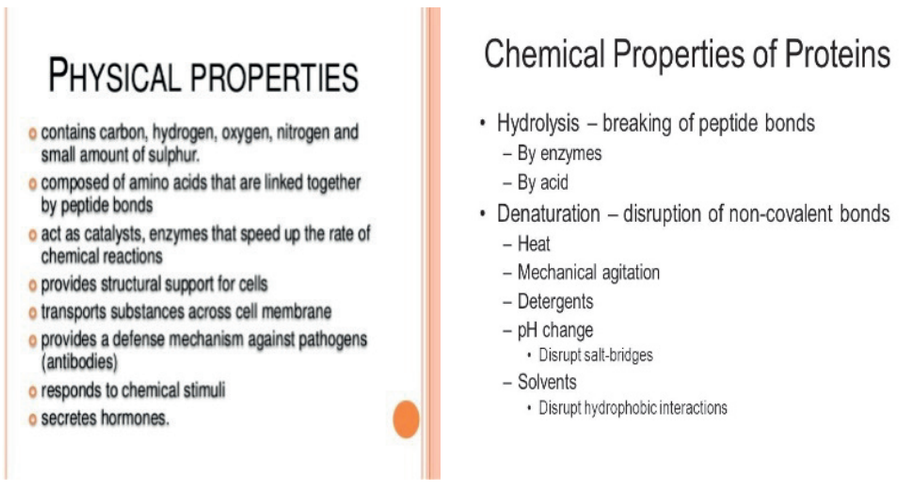
Step 2: Heat up the frying pan/ saucepan on the source of fire and add the cooking oil.

Pour the beaten egg in step 1into the heated frying pan / saucepan. Fry until cooked and serve on the plate.

Identify the changes that have taken place in the egg and write them in your note book.

Step 3: get the ½ cup of milk and add 2 table spoons of lemon juice/tomato juice/ vinegar. Mix well and observe the changes that take place. Write these in your book.

Summary



Glossary

- Amino acids
- Denaturation
- Curdle
- Coagulation

Topic: Carbohydrates

By the end of this topic, you should be able to;

- Classify carbohydrates and list the sources of carbohydrates
- Explain the functions of carbohydrates and roughage
- Explain the effects of deficiency and excessive intake of carbohydrates
- Control of obesity
- Describe the effects of heat on carbohydrates

Lesson 1: Classification and Sources of Carbohydrates

Objectives:

In this lesson, you should be able to:

a) Classify carbohydrates.
b) Identify the sources of carbohydrates.

Study requirements you will need

Time, a notebook, a pen, Carbohydrate foods, food items

Instructions

As you go through this lesson, there is need to;

- Find a convenient place with less destruction to go through the activities.
- Consult from your family members when stuck.

Classification of Carbohydrates

Introduction

When one mentions carbohydrates, what usually comes to your mind is energy giving food. Carbohydrate foods are around us. We consume them every day. They vary basing on the content of sugars that is within them. Which carbohydrate foods do you know? Can you think of the different ways in which they are classified?

These are the cheapest and most abundant nutrients in the world. Animals are unable to synthesize carbohydrates but most plants go through a process known as photosynthesis where they manufacture them from carbon dioxide and water in the presence of sunlight.

Activity 1: Classification of carbohydrates

- With consultation from your family members, find out the classification of carbohydrates.
- Take note of their responses.

The sources of carbohydrates

You know that the nutrient carbohydrate is directly related to energy. They can be in the form of fruits, cereals or foods that are served as part of the meal.

Activity 2: Discovering the sources of carbohydrates.

Which foods have you eaten in the last two days?

- Find out which foods are sources of carbohydrates.
- Write down the responses in your notebook.

Summary

The carbohydrates are mainly from plant sources, however, animal sources are also present such as glycogen.

Classification of carbohydrates and their sources

- Monosaccharides- (single sugars)
- Disaccharides- (double sugars)
- Oligosaccharides-(3-10 units of sugars)
- Polysaccharides - (more than 10) sugars.

a) Monosaccharides

- They are simple sugars
- They dissolve in water
- They are crystalline.

Examples.

i) Glucose (dextrose/grape sugar)

It is the simplest form in which carbohydrates exist in foods and in the body.

It is found naturally in ripe fruits, honey, and in all carbohydrate foods and that is the main reason for their sweetness.

When digested in the body it circulates as blood sugar.

ii) Fructose

It is found in sweet fruits and honey. It is the sweetest sugar.

iii) Galactose

It is manufactured from milk sugar called lactose.

b) Disaccharides

These are known as double sugars.

They are formed by joining two monosaccharides sugars with elimination of a water molecule.

When a water molecule is added to disaccharides, it breaks it down to monosaccharides in a process called hydrolysis. These can occur during digestion.

Examples;

i) Sucrose (cane sugars)

It is mainly present in sugar cane, beet root, vegetables and fruits.

Glucose+ fructose → sucrose

Normal table sugar has sucrose. It is the main form in which carbohydrates are transported in plants.

ii) Maltose (malt sugar)

Glucose+ glucose → maltose

It is produced by germinating cereals and used in beer making.

Lactose (milk sugar)

Galactose+glucose → lactose

Note: all monosaccharide and disaccharide are sweet, soluble in water and crystalline.

c) Oligosaccharides

These have between 3-10 sugars molecules

Examples

1. Starchose in beans
2. Raffinose

d) Polysaccharides

Poly means “many” so these are forms when many monosaccharides units are chemically joined together.

They have a formula of $(C_6H_{10}O_5)n$ where n varies according to the numbers of monosaccharides.

Examples

- Starch
- Cellulose
- Dextrin
- Pectin
- Glycogen.

Starch

It is the form of carbohydrates used by plants to store food in root vegetables, potatoes, cassava, cereals and pulses e.g. ground nuts and soya beans.

It is plentiful in foods such as maize and millets.

Dextrin

When starch food such as bread are heated, the large starch molecule nearest to the heat break down into simpler but still fairly large molecule called dextrin in the process known dextrinisation. These brown more readily resulting into a crusty top on bread/the colour of toast.

Pectin

This is found in unripe fruits and vegetables.

It is essential for setting of jam. It has no function in the body.

Glycogen/animal starch

It is the energy reserve for animals. The excess glucose is converted to glycogen which is stored in the liver and muscles.

Cellulose (roughage)

It is present in all plant foods.

It is found in the skin of vegetables and fruits and the outer brand layer of cereals.

It is not digested by human body.

It collectively forms dietary.

Here is a summary of a few examples of where you will find most carbohydrates.

- **Dairy Products –** Yogurt, Milk, Ice cream
- **Fruits –** Fruit juice or Whole fruit
- **Grains –** Cereal, Bread, Wheat, Rice
- **Legumes –** Plant-based proteins, Beans
- **Starchy Vegetables –** Maize, Potatoes, Cassava

Hopeful, you had a great lesson!

TERM TWO

Topic: Carbohydrates

Lesson 2: Functions of Carbohydrates

Objectives:

In this lesson, you should be able to:

a) Explain the functions of carbohydrates and roughage

Study requirements you will need

Time, a notebook, a pen, Carbohydrate foods

Functions of carbohydrates and roughage.

Introduction

You will realise that no one can take a day without eating any carbohydrate foods. Why do you think so? Carbohydrate foods and roughage play a significant role in our bodies.

Activity 1: Functions of carbohydrates and roughage.

- Share with your family members the role of carbohydrates and roughage in the body.
- Write down their responses in the note book.

Summary

Carbohydrates are significant sources of energy in our bodies.
Roughage are also known as dietary fibre. They are edible parts of plants that cannot be digested in the body but aid in the digestion process as food goes through the alimentary canal.

Biological functions of carbohydrates

- They are oxidized in the body to produce heat and energy, a constant supply is necessary for the functioning of the muscles.
- Excess carbohydrates are converted into fats which are stored below the skin in the adipose tissue to regulate heat loss. Too much of it causes obesity.
- Cellulose stimulates the peristaltic movement in the intestine and prevents constipation.
- They perform a protein sparing action where they provide energy and the proteins are left to perform their main function of body building other than energy provision.

Economic value of carbohydrates in the diet.

- Carbohydrates are the cheapest food available.
- They provide plenty of bulk and easily satisfy hunger.
- They provide energy and warmth fairly quickly.
- They may be cooked in many different ways to provide variety in a diet.
- They are commonly available in all parts of the country.

Functions of dietary fibre or roughage

- It aids movement of bowels along the alimentary canal hence preventing constipation.
- It slows down glucose absorption hence useful for people with diabetes.
- It prevents many bowel diseases e.g. appendicitis.
- It lowers blood cholesterol levels in certain individuals hence lowering incidences of heart diseases.
- It is good for those on slimming diet as it gives a feeling of satisfaction and one consumes less food.
- It allows chewing hence the jaw is developed.

Glossary/Key words

- Alimentary canal
- digestion
- Dietary fibre.
- Roughage
- Peristalsis
- slimming

Stay blessed!!

Lesson 3: Effects of deficiency and excess intake of carbohydrates

Objectives:

In this lesson, you should be able to:

- a) Explain the effects of deficiency and excess intake of carbohydrates

Study requirements you will need – Time, a notebook, a pen

Effects of deficiency and excess intake of carbohydrates

Introduction

Having known well the functions of carbohydrates, then you will be able to understand the effects of deficiency of carbohydrates. Have you seen anybody in your community who is not having enough carbohydrates in their body? Like the saying goes, “Too much of anything is always bad” You will have some effects when the carbohydrates are taken in excess. The condition that results from deficiency of carbohydrates is known as marasmus.

Activity 1: Effects of deficiency and excess intake of carbohydrates

- What do you think will happen to the bodies of these different groups of people body if they do not receive carbohydrate foods?
  a) Adolescents
  b) Children
  c) Elderly
- Take note of your responses.

Activity 2: Signs of carbohydrate deficiency.

- The pictures below are of children who are carbohydrate deficient. Observe carefully and note down the characteristics of these children.

Summary

Effects of carbohydrates deficiency.

Marasmus

Carbohydrates play a major role in giving us satisfaction. When one is not satisfied or having food, they starve. Marasmus is a condition got when one is undergoing starvation. It often affects children under one year when they get too little food containing carbohydrates.

It can also be caused by prolonged breast feeding without giving supplementary food containing carbohydrates and other nutrients as the child grows.

Worms and unsanitary conditions that can lead to disruption of the digestive system can also cause marasmus

Signs and symptoms of marasmus

- The child becomes thin
- Child becomes weak
- Rough and dry skin
- The child is alert but quiet because of hunger and can eventually die.
- Retarded growth such as the child appears small for his age.
- Pre-mature wrinkles develop in the adults
- Poor muscle development
- Anaemia (lack of sufficient blood) occurs.
- Miscarriage or Still birth in pregnant women i.e. giving birth to a dead child

Prevention of marasmus.

Adequate amount of food mainly rich in carbohydrates and proteins should be provided and other nutrients.

Excess carbohydrates

Excess carbohydrates are converted into fats and can lead to a condition called obesity as will be discussed in the following lessons.

Note: Avoid over eating animal protein food especially meat because it may lead to obesity.

Glossary/Key words

- marasmus
- Deficient
- Obesity

Hope you enjoyed the lesson!

Lesson 4: Control of obesity

Objectives:

In this lesson, you should be able to:

Control of obesity

Study requirements you will need

- Time
- A notebook
- A pen

Control of obesity

Introduction

The condition of obesity results from consuming excess carbohydrates and fatty foods. Excess proteins are also converted to fats. A person puts on a lot of weight and in future might find it hard to perform all the daily activities efficiently. Have you seen an obese person? Do you think it can be a preventable condition?

Activity 1: Control of Obesity

Share with your family members and ask them the different ways people can control having the condition of obesity.

- Take note of your responses.

Summary

Obesity is a disorder caused by excessive intake of high calorie foods thus making a person over weight.

It is a stage in which a person has excessive amount of body fat. An obese person has a lot of fats under the skin and around the internal organs such as the heart and kidney.

Causes of obesity.

- Excessive eating especially calorific foods (fats and carbohydrates).
- Reduced activity results in lower energy use e.g. a school leaver who may give up in sports.
- Pregnancy, many women gain weight at this time as they tend to eat a lot and don't lose it after wards.
- Lack of nutritional education, poverty which prompts people to eat cheap high carbohydrate foods.
- Entering luxurious and inactive lives which lead to over consumption of meals and alcohol.
- A few medical conditions e.g. hormone imbalance, kidney failure etc. These destruct the proper digestion process, hence excess food in the body.
- Emotional factors such as boredom and depression can cause some people to eat a lot.
- It can be inherited, in a way that people in the same home have similar feeding habits which could be poor and lead to obesity..

Prevention/ways of controlling obesity.

- Reduce intake of carbohydrates and fatty foods.
- Don't cook food in too much fat.
- Vary methods of cooking such as steaming and boiling & grilling.
- Eat plenty of fruits and vegetables. They give a feeling of satisfaction and prevent you from over eating.
- Exercise is excellent for toning up muscles and improves weight loss.
- Restrict the intake of sugary food such as biscuits, cakes, sodas etc.
- Proteins intake should be maintained but choose low calorific proteins like white fish, chicken, etc

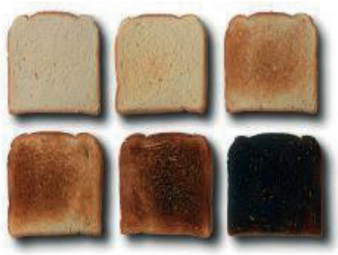
- Join a slimming club for motivation and support.

Glossary/Key words

- calorific
- slimming
- obesity

Did you enjoy the lesson!

Lesson 5: Effects of heat on carbohydrates



Objectives:

In this lesson, you should be able to:

a) Describe the effects of heat on carbohydrates

Study requirements you will need

- Time
- A notebook
- A pen
- Carbohydrate foods
- Heat source

Introduction

In the earlier lessons, you discovered the food sources of carbohydrates as a nutrient. When the carbohydrate foods are exposed to dry and moist heat, they all have different effects that they show. It is important for you to know the effects of heat on these foods.You are able to use this knowledge in cookery to know whether the food is cooked or undercooked.

Activity 1: Effects of heat on Carbohydrates

- Get any carbohydrate food of your choice and subject it to;

a) A Dry heat. Take note of them.

What are your observations?

b) A Moist method of cooking.

What is your observation as the cooking takes place? Write them down.

Summary

Effects of heat on sugars

- Moist heat causes sugar to dissolve and it can be seen when making a cup of tea. Therefore it will be difficult for sugar to dissolve in cold water. It dissolves better in heat presence.
- Dry heat causes sugars to melt.
- Further dry heating will turn the sugar into syrup,darkens it and eventually burn

NOTE: Caramelisation takes place when sugar melts to form a brown substance known as syrup/caramel

Effects of heat on starch

- Most heat cause the starch grains to swell as the starch temperature rises, the cell walls break releasing starch cells which thickens the white sauce. This is known as gelatinization. It is seen in cooking porridges, beans etc
- Moist heat causes the cell walls of vegetable to soften e.g. in boiled potatoes
- Dry heat causes the grains to burst e.g. popcorn
- Dry heat causes the starch on the outside to darken and change to dextrin eg brown crust on top of the bread.
- Overheating causes the starch to carbonize /burn

Glossary/Key words

- Carbonise
- Gelatinise
- caramelise

References

- Foods and Nutrition by Anita Tull
- Foods and Nutrition by Deidre Madden
- Self-study materials
- Internet

Topic: Lipids

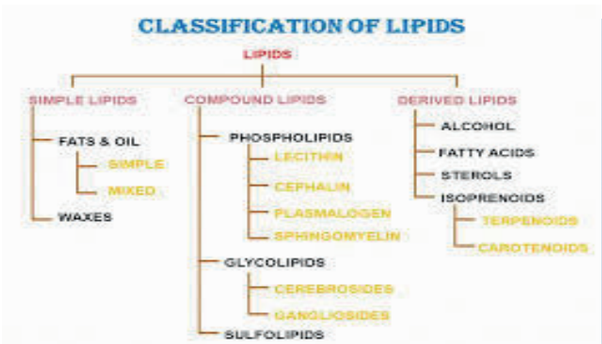
Lesson 1: Classification and Sources of Lipids

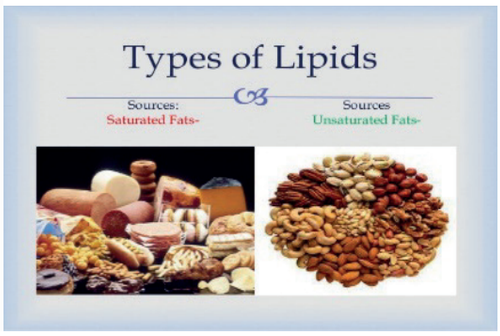
Learning objectives: by the end of this lesson you able should be able to

a) Classify the lipids
b) Sources of lipids

Study requirements

- Pen and note book
- Time





Introduction

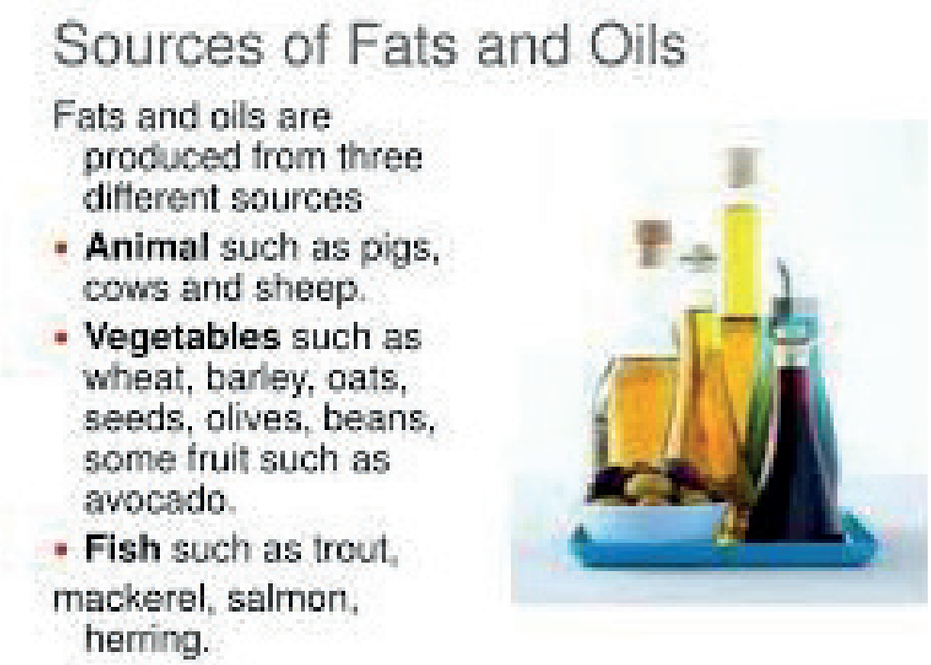
Lipids are made up of carbon, hydrogen and oxygen. They are organic compounds that are fatty acids or derivatives of fatty acids. They are insoluble in water but soluble in organic solvents. They are found in both animals and plants.

Activity 1: Classification and sources of lipids

1. Look around in your home, and identify the types of lipids you have. Cluster them into either animal or plant sources. Note them down in your book.

Summary- Lipids are classified into three types namely

- Simple lipids
- Compound or complex lipids
- Derived lipids



Glossary

- Compound lipids
- Derived lipids

References

- Foods and nutrition by Anita Tull
- Foods and nutrition by D. Madden.

Lesson: 2

Learning objectives: by the end of this lesson you able should be able to

c) Explain the functions of lipids
d) Discuss the effects of fats and oil deficiency

Study requirements

- Pen and note book
- Time

Introduction

You have learnt some of the food values needed by the body. We are yet to find out why lipids are important to the body. Basically lipids perform three primary biological functions within the body

- They serve as structural components of cell membranes
- As energy storehouses
- Important signalling molecules

Activity 1: Functions and effects of deficiency of lipids

1. Discuss with your family members the functions of fat in the body and the likely effects of deficiency.

Summary

Functions of lipids in the body

- Main source of energy and stored as adipose tissue
- Structural components of cell membranes i.e. create a barrier for the cell and controls flow of materials.
- Main source of fat soluble vitamins A, D, E and K.
- Protection of internal organs.
- Maintain body temperature.
- Helps in the formation of hormones and vitamins.
- Helps in the formation of brain and bone marrow.

If you eat more than the recommended amount you are likely to increase your risk to heart diseases and also become obese.

Effects of fat deficiency would be

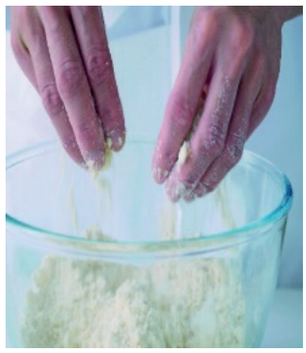
- Dry, scaly skin
- Frequent infections
- Slow wound healing
- Feeling constantly cold
- Dry hair and/ loos of hair
- Hormonal problems including loss of menstrual cycle
- Mental fatigue
- Deficiencies of fat soluble vitamins

Glossary

- Lipids
- Fats
- Adipose tissue

Lesson 3: Properties of fat





Learning objectives: by the end of this lesson you able should be able to

a) Describe the properties of fat

Study requirements

- Pen and note book
- Time

Introduction

Have you come across lipids that are either fats or oil at room temperature? Have you wondered why there is such a distinction? They do behave differently when exposed to heat. Almost all edible fats are composed of three units of fatty acids combined with a single unit of glycerol and are also called triglycerides. There are two forms of fats, the animal and vegetable. There are twenty-five fatty acids distributed between the animal and vegetable fat. These determine the colour, texture, and flavour of the different fats. The consistency of the fat i.e. solid or liquid at room temperature depends on whether the fatty acid is saturated or unsaturated.

Activity 1: Properties of fats

For this activity you need to note down whatever you observe in your note book.

Materials required

- 2 table spoons of cooking oil
- 2 table spoons of fat
- 2 saucepans
- ½ cup of water
- A clear empty bottle
- Heat source (charcoal stove, fireplace, gas cooker, electric cooker)

Procedure

Step 1. Compare the physical properties of the cooking oil and fat i.e. colour, smell and texture. Make your observations and write you're your findings.

Step 2. Pour the water into the bottle and add one table spoon of oil.

Record what you see.

Step 3. Shake the bottle of water with oil added for about 3 minutes.

Write down what you see.

Step 4. Put the cooking oil and fat in separate saucepans on to them on to the heat source for about 5 minutes. Observe the changes that take place and record them in your book.

Summary

Properties of fat and oils

- Fats are insoluble in water.
- Fats are soluble in organic solvents
- Fats have the ability to form emulsions.
- Fats don't keep well when they decompose they are known as rancid.
- Saponification: when a fat and alkali together soap and glycerine is formed.
- Fats readily absorb flavours and odours
- Solid fat melts on heating and on continued heating a blue haze begins to raise. The fat begins to decompose. At this point it may self-ignite.
- Hydrolysis - this occurs when triglycerides react with water to form glycerol and fatty acids.

Glossary

- Rancidity
- Saponification
- Emulsion
- Plasticity
- Melting

References

- Foods and nutrition by Anita Tull
- Foods and nutrition by D. Madden

Lesson 4: Uses of fat in cookery

Learning objective: by the end of this lesson you should be able to

a) State the uses of fat in cookery

Study requirements
Note book and pen

Introduction

You do realise you do not use fats and oils to only provide energy and a source of the fat –soluble vitamins A, D, E and K but to also serve chemical, physical and nutritional functions in the food you eat. What else have you used fats and oil for in your daily meals? Whenever fats and oils are used they improve the appearance, flavour, palatability, colour, nutritional and energy value.

Activity 1: Use of fat in cookery

Salad dressing (mayonnaise)

Materials required

- A bowl
- Whisk/ folk
- A bottle
- 1 raw egg yolk
- 1 level tea spoon mustard
- Salt and pepper
- 1 tea spoon sugar
- ¼ litre vegetable oil
- 1 table spoon vinegar/ lemon juice

Procedure

1. Put the egg yolk into bowl
2. Mix the egg yolk with salt, pepper, sugar and mustard
3. Add oil drop by drop, and with the right hand stir and rub rapidly, using a wooden spoon.
4. When the egg and oil have formed a smooth ball add the oil a little more quickly, about half a teaspoonful at a time.

5. When sufficient oil has been added, gradually add the measured quantity of vinegar or lemon juice.
6. Serve with a salad.

Note: this sauce will keep for 1 or 2 weeks. If it has to be kept for a longer period, the bowl containing the mayonnaise should be heated over boiling water for about 5 minutes. Whisk during this process. Store in a bottle

Activity 2: uses of fat in cookery

While carrying out this activity write down what you observe.

Describe what fat is used in the following:

1. Grilling of meat
2. Shallow frying of sausages or egg plants
3. Deep frying of chips

Summary

Uses of fat in cookery

- Frying or sautéing food or blending with other ingredients to make dressings and sauces
- To improve the keeping quality. Because fat is often emulsified withmoisture in baked products, it helps to retain moisture and prevents them from drying out or going stale too quickly.
- Fat alters the appearance of food by creating a glossy or moist visual texture. It also aids in the browning process of many foods, giving them an appealing golden brown colour.
- Fats and oils are an important component in most emulsions. They are used to make salad dressings, mayonnaise, gravies and cheese sauces. Emulsifying fat into a liquid produces unique flavour and texture qualities.
- Fat has the unique ability to absorb and preserve flavour. Oils are often infused with herbs and spices for preservation. Fat also contain compounds that lend specific flavours of their own.
- Fats provide one of the most efficient modes of heat transfer during cooking and also facilitates crust formation.
- The type of fat used in a product often determines the melting point of the final product. This characteristic is especially important for items like chocolate and salad dressings. Butter which is solid at room temperature makes it perfect for using in chocolate likewise vegetable oils are used in salad dressings.
- Fats are the most calorie- dense compound in food and also delivering the fat soluble vitamins.
- Fats play an important role in making foods satisfying. This is because fats take longer to digest than carbohydrates or proteins, high fat foods stay in the stomach longer and delay the feeling of hunger

- Shortening: fat has the ability to make baked goods tender and flaky by facilitating the formation of gluten strands.
- Solubility: many of these fat –soluble compounds are responsible for foods; flavour and even the vitamin content.
- Texture: fats provide a very specific lubricating feeling that is why most dry chips are served with a high fat content dips or spreads. Emulsions made with fat are responsible for the creamy texture of many items like ice cream, mayonnaise and other sauces.
- Spreading: carbohydrate - rich foods, such as bread and scones are more palatable when served with fat.
- Aeration. In rich cakes, fat has the ability to trap and hold air. This gives the cake a good volume and texture.

Glossary

- Emulsion
- Shortening
- Emulsifying

Topic: Mineral salts

By the end of this topic, you should be able to;

- Classify minerals.
- Explain the functions and effects of deficiency of calcium, phosphorus, iron, potassium, sodium, chlorine, iodine, sulphur and fluoride;
- List the dietary sources of the minerals

Lesson 1: Classification of Minerals Salts

Objectives:

In this lesson, you should be able to:

- Classify minerals salts.

Study requirements you will need

Time, a notebook, a pen

Introduction

In the line of nutrition, what have you heard about mineral salts? Mineral salts are nutrients in foods. They are classified according to the quantities needed by the body. Can you think of these classifications? They are inorganic substances which cannot be seen with our naked eyes. They play a major role in energy release and production.

Activity 1: Classification of mineral salts.

- Discuss with your family members the different classifications of mineral salts.
- Note down the responses.

Summary

Mineral salts

These are organic elements that do not produce energy. They are required in small amounts. They are water soluble and hence can be leached and taken out when cooking food containing them.

Classification

They are divided into two (2) groups

1. Macro minerals

These are required in relatively large minerals

They include the following:

Calcium (Ca), phosphorous (p), Potassium (K), sulphur (S), chlorine (Cl), magnesium (Mg).

2. Micro elements: These are required in minute or small quantities

They include:

Iodine (I), copper (Cu), manganese (M), chromium (Cr), Selenium (se), fluorine (F), cobalt (Co),

Glossary/Key words

- Macro minerals
- Micro minerals

References

- Foods and Nutrition by Anita Tull
- Foods and Nutrition by Deidre Madden
- Self-study materials
- Internet
- Oral literature

Hope you had a good lesson!

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