

What we get from food



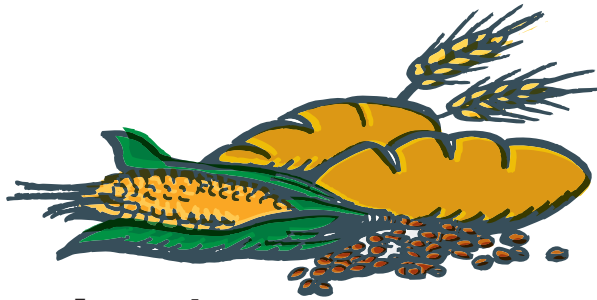
What we get from food is about the nutrients we get from foods and how important it is for proper growth and development and prevention of disease to eat the right variety and the right amounts of foods that provide these nutrients. It explains the functions of carbohydrates, protein, fats, vitamins and minerals in the body and their importance in the diet. It provides some examples of foods that are good sources of these nutrients.



Lesson 4
Learning about carbohydrates, protein and fats



Lesson 5
Learning about vitamins and minerals



LEARNING OBJECTIVES



*By the end of
the lesson, you
will be able to:*

- name and describe the three macronutrients and explain their main functions in the body;
- identify locally available foods that are good sources of each macronutrient;
- assess the amount of carbohydrates, protein and fats in your diet.

Lesson 4

Learning about carbohydrates, protein and fats

LESSON OVERVIEW



This lesson is about the importance of carbohydrates, protein and fats (called the macronutrients) in a healthy, balanced diet.

It explains how people need the right amounts of these macronutrients for proper growth, development and good health. The three macronutrients are discussed one by one and can be studied in three different sessions. The lesson begins with talking about carbohydrates that provide fuel for activity, growth and body functions. It then examines the vital role of protein in the basic body functions. Finally, it discusses how fats are essential for proper growth and good health, and describes the different types of fats. For each macronutrient, some examples of foods that are good sources are provided and research of locally available foods rich in each of these nutrients is encouraged.



Part 1

Carbohydrates: their functions and good food sources



READING

Food contains many different nutrients that help the body function well; most foods are a mixture of different nutrients. The body cannot produce these nutrients, so they must be obtained from the food we eat. The nutrients in foods are grouped by their similar characteristics and the functions that they carry out in the body. Certain nutrients are called “macro” nutrients because the body needs them in fairly large amounts in order to function properly; these are carbohydrates, protein and fats. Other nutrients, also necessary for body functions, are called “micro” nutrients because the body needs them in very small amounts; these are vitamins and minerals. A nutrient can perform one or several functions in the body. Adequate amounts of both macro and micro nutrients are needed for proper growth, development, good health and prevention of disease.

Water is not classified as a macronutrient or micronutrient, but is essential for health and life. Water makes up a large part of our body weight and is the main component of our body fluids. The body needs more water every day than any other nutrient. Water carries nutrients throughout the body, provides lubricants and cushions for the joints and the eyes, eliminates wastes, and helps maintain body temperature and regulate many body processes. We lose water every day and our bodies do not store extra water, so we need to replenish water through the foods and liquids we eat and drink.

The three macronutrients – carbohydrates, protein and fats – are the major source of energy and bulk (volume) in our diets. They are the only nutrients that contain energy from food, which is measured in calories. Energy in our food is necessary for activity, growth and other body functions such as thinking, digesting and metabolizing food (all reactions of the body to use food), breathing, and circulating blood and oxygen. Getting sufficient energy is essential for everyone in order to maintain body growth and development and good health. Energy is so important to survival that we have developed the ability to store it for future use in the form of fat if we take in more than we need at the moment. (Another source of energy, alcohol, is not an essential nutrient needed by the body, but it can contribute a significant number of calories to the diet.) Carbohydrates, protein and fats, in addition to providing energy, each have very specific functions in the body and must be supplied in sufficient amounts to carry out those functions.

TO THINK ABOUT WHILE READING



What does the word ‘macronutrient’ mean?

What do carbohydrates give us?

Do you know what foods are main sources of carbohydrates?



Carbohydrates

Carbohydrates provide the body's main source of energy. Plants make carbohydrate from sunlight (photosynthesis) as a way to store the sun's energy for its own use. When we eat the plant, we are able to use that stored energy. The major role of carbohydrates is to provide energy to every cell in the body. The energy we get from eating carbohydrates provides the fuel we need for our activities and growth. Carbohydrates are necessary for the brain to function; they help muscles work better. Some of the carbohydrates we eat are broken down and used for energy the body needs for physical activity; some are used for growth and overall maintenance and for the renewal of body tissues.

Food sources

In general, carbohydrates come from plants. Foods rich in carbohydrate are rice, maize, wheat, millet, sorghum and other cereals, foods made from cereals, all types of root crops such as potatoes, yams and cassava, legumes such as peas and beans, vegetables, fruits and sugars. Many of these foods also provide essential vitamins and minerals.

Types of carbohydrates

Carbohydrates are found in three forms: sugar, starch and fibre. Each form of carbohydrate serves different purposes and is important in our diets. A healthful diet includes at least half of daily calories from carbohydrates (50–65%), with plentiful starch and fibre and limited sugar.

Sugar is quickly absorbed into the body and used for energy. There are many types of sugars and commonly used names for sugars. It is found naturally in fruits, milk, honey and the sap of certain trees. It is also made from the processing of sugar cane or beets into table sugar or other sweeteners to be added to foods. Sugar, in addition to providing calories for energy, improves the flavour, texture and appearance of foods, is used in food preservation (as in jam), and in cooking and baking foods.

While fruit contains sugar, it also provides water, fibre and important vitamins and minerals that increase its nutritional benefits. Honey does contain a few vitamins and minerals, but not enough to offer nutritional benefits, since the total amount eaten is usually small. As consuming large amounts of sugars or sweetened foods may lead to reducing intake of other foods containing important nutrients, it is recommended to limit consumption of concentrated sweets, but not of foods such as fruits or milk that naturally contain sugar.

Starch is broken down by the body into simple sugars to be absorbed. Starchy foods stay in the body's system longer than sugar, giving a sense of feeling "full" for a longer period of time. However, starch is eventually



broken down. Starch provides the majority of the calories we eat and starchy foods are widely grown and usually available in sufficient amounts to provide the main energy source in most diets. Plants that contain starch, or foods made from starchy plants, form the basis of most diets. Because the refining of starchy foods can sometimes cause important nutrients to be lost or destroyed, it is recommended that unrefined foods be included in the diet as much as possible. For instance, whole grains (as in whole wheat bread) have many more nutrients than refined grains (as in refined white bread).

Starch is found in: grains (rice, corn/maize, wheat, millet, oats), roots and tubers (potatoes, cassava, yams), legumes (peas and beans), and certain fruits (breadfruit, banana/plantain, water chestnut).






Fibre is a carbohydrate portion of a plant that the body cannot digest and absorb. This makes fibre very important for “cleaning out” the digestive track as it passes through the body. Fibre can absorb water and help get rid of the body’s waste products. Different types of fibre exist in foods; some are more “woody” and do not dissolve in water, as can be seen in the hard stems of some vegetables. Some are more “gummy”, dissolve in water and exist in the skins and peelings of fruits and vegetables. Each type of fibre has different properties, but all are important for good health. Fibre may help prevent certain diseases such as heart disease, cancer and diabetes. While not eating enough fibre can cause constipation and other intestinal problems, eating too much fibre can cause nutrients to pass through the system too quickly to be absorbed.

Foods containing fibre are: wholegrain cereals, starchy roots, fruits, most vegetables, beans, peas and other legumes and oilseeds.

Foods that have had little processing or refining have the greatest amount of fibre, as well as higher amounts of vitamins and minerals, which are often lost during refining.



MATERIALS

-  Fact sheet *Basic macronutrient facts: carbohydrates*
-  Ask yourself work sheet *Carbohydrates in my diet*
-  Answer work sheet *Carbohydrates in my diet*
-  Match it work sheet *Carbohydrates facts matching*
-  Work sheet *Carbohydrates around the world*



ACTIVITIES

Carbohydrates in my diet



Go to the Ask yourself work sheet *Carbohydrates in my diet* and fill in what you know about the different types of carbohydrates and the carbohydrates in your foods and diet.

Check the answer checklist to see if your answers are correct.



Tip: Look for more information on carbohydrates in the Fact sheet *Basic macronutrient facts: carbohydrates*.

Carbohydrates collage



Look at the Fact sheet *Basic macronutrient facts: carbohydrates* and make a list of all carbohydrate foods available in your local diets and markets. Collect as many pictures of these foods as possible. You can draw local foods, take photos of them or cut out the illustrations from food labels, packages, newspapers or magazines.

Once you have collected the images, work individually or in three groups and create a poster or a collage called “Main Sources of Carbohydrates”. Divide your poster into three parts: Sugary foods; Starchy foods; Fibre foods. Display the poster in your school for every student, teacher and parent to consult.

Carbohydrates facts matching



If you are working individually, go to the Match it work sheet *Carbohydrates facts matching* to see if you can correctly match some facts about carbohydrates.

If you are working in a group, make three columns on a large sheet of paper or on the classroom board and write in the following three headings:

- A. Starch
- B. Sugar
- C. Fibre

Then, on separate strips of paper or cards write each of the facts listed in the work sheet. Mix up the facts and hand out the fact strips until they are all distributed. Each person reads out the fact strips one at a time and places it under the macronutrient column where they think they belong. Discuss and check the answer key to see if the placement is correct.

Carbohydrates around the world

Some foods rich in carbohydrates form the basis of many peoples’ diets around the world. They are often called “staple” foods and are eaten regularly, almost at every



meal. Staple foods supply a major part of dietary energy. The main kinds of staple foods are:

- Cereals: rice, maize, wheat, rye, barley, oats, millet, sorghum
- Roots and tubers: potatoes, cassava, yams
- Legumes: beans, lentils, soybean

Choose a country located in each of the following regions: Africa, Asia, Europe, Middle East, North, Central and South America, Oceania. Conduct an investigation using the Internet, visiting a library, asking experts or using any other resources available, and find out what staple foods are commonly eaten in these countries.



Use your findings to fill in the Work sheet *Carbohydrates around the world*.

Cooking competition

Divide into groups and cook a traditional dish based on the staple food from a different country or region. You can use the information gathered in the previous activity or check the Internet or other sources for recipes. Invite your friends and families to taste the dishes and select the winner. Take pictures of every dish, write the recipes next to the photos and create your “International Staple Foods” recipe book.



KEY POINTS

Review these four key points to remember about carbohydrates, their functions in the body and good food sources. See if you feel that your knowledge has improved and how you can apply it to your own diet and that of your family.

Carbohydrates

- Carbohydrates provide the body’s main source of energy for activity, growth and body functions.
- Carbohydrates exist in three forms: sugar, starch and fibre.
- Foods rich in carbohydrates are all types of cereals, root crops, legumes, vegetables, fruits and foods containing sugars.
- Healthful diets include at least half of daily calories from carbohydrates, with foods containing plentiful starch, whole grains and fibre and limited amounts of sugar.



Part 2

Protein: its functions and good food sources



READING

Protein provides amino acids for basic body functions. Amino acids are combined in the body to create protein substances needed to form body tissues. The amino acids in protein are often referred to as the “building blocks” of life. Without protein, the most basic life functions cannot be carried out. Almost all of the cells in the body are constantly being broken down and then rebuilt; this process requires a steady supply of protein. Protein works in the body to build and repair body tissues such as muscles, bones and organs, blood, skin and hair and repairing damaged tissues due to illness or injury. It is necessary for clotting blood and for keeping the immune system strong by developing antibodies to fight disease.

Protein is also a major component of the body’s transportation system that carries oxygen and nutrients to all cells of the body. Sufficient protein is necessary to maintain proper fluid regulation; without protein to help fluids remain in their appropriate place in veins, arteries and cells, liquid can leak out into body extremities (feet and legs) and the abdominal cavity. (For example, this is what happens in Kwashiorkor.) During periods of high growth, such as pregnancy, infancy, childhood and adolescence, extra protein is needed to provide for extra tissue development, in addition to keeping up the normal maintenance and repair of existing tissue, hormones and enzymes.

When body energy levels are low, the body will use protein for energy, but this is not the best use of protein. This takes protein away from performing its specific important functions. If energy intake is low for a long period of time, protein will be used for energy by breaking down the tissues and organs to meet energy needs.

Food sources

Protein is found in foods from both animal and plant sources, which provide different combinations of amino acids needed by the body. Because we need to replace the amino acids in the body as they are lost or used up by the body processes, we must eat foods that have the necessary amino acids to be used to manufacture body protein. To help provide all of the amino acids we need, it is important to eat a variety of foods of plant and animal origin.

TO THINK ABOUT WHILE READING



Do you know
why we need
protein?

What foods are the
best sources
of protein?

How many kinds
and servings
of protein
do you have
in your diet?



Foods from animal sources rich in protein are: all types of meat, poultry, fish, eggs, milk, cheese and yoghurt.

Foods from plant sources high in protein are: dried beans, peas, lentils and other legumes, nuts, pumpkin seeds and soybean.



MATERIALS



Fact sheet *Basic macronutrient facts: protein*



Ask yourself work sheet *Protein in my diet*



Answer work sheet *Protein in my diet*



Work sheet *Foods rich in protein*



Work sheet *Protein around the world*



ACTIVITIES

Protein in my diet



Go to the Ask yourself work sheet *Protein in my diet* and fill in what you know about the importance of protein and protein in your diet and the foods you eat.



Tip: Look for more information on protein in the Fact sheet *Basic macronutrient facts: protein*.



Check the Answer work sheet *Protein in my diet* to see if your answers are correct.

What foods are rich in protein?



Go through the list of foods in the Work sheet *Foods rich in protein* and underline or circle all the best sources of protein. Use the Fact sheet *Basic macronutrient facts: protein* for more information on protein.



Protein poster



Look at the Fact sheet *Basic macronutrient facts: protein* and make a list of all protein foods available in the local markets and diets. Collect as many pictures of these foods as possible. You can draw local foods, take photos of them or cut out the illustrations from food labels, packages, newspapers or magazines.

Once you've collected the images, work together or in small groups and create a poster or a collage called "Main Sources of Protein". Display the poster in your school next to the one on carbohydrates created previously.



Protein around the world

Traditional diets around the world include different foods rich in protein. They supply people with the building blocks of life – amino acids – and come from both animal and plant sources.

Choose a country located in each of the following regions: Africa, Asia, Europe, Middle East North, Central and South America, Oceania. Conduct an investigation using the Internet, visiting a library, asking experts or using any other resources available and find out what protein-rich foods are commonly eaten in these countries.



Use your findings to fill in the Work sheet *Protein around the world*.



KEY POINTS

Review these three key points to remember about protein, its functions in the body and good food sources. See if you feel that your knowledge has improved and how you can apply it to your own diet and that of your family.

Protein

- Protein provides the “building blocks” of life – amino acids. Without protein, no life functions can be carried out. Life itself would not be possible.
- To meet the body’s protein needs, it is important to eat a variety of foods from both animal and plant sources.
- Foods rich in protein are all types of meat, fish, poultry, eggs, milk and milk products, dried beans and peas and other legumes and nuts.



Part 3

Fats: their functions and good food sources



READING

Fats provide energy and carry out a variety of important functions in the body. Dietary fats supply essential fatty acids that are needed for the absorption of vitamins A, D, E and K (called “fat soluble” vitamins). They contain the highest level of energy (9 calories per gram) of any nutrient and are essential for growth and health. Fat is also a necessary component of body tissue. The brain and central nervous system are rich in fat and fat must be sufficient in the diet in times when these tissues are developing, as in pregnancy and the first several years of life. The body uses fat to manufacture needed chemicals such as hormones. Fats protect the cells and internal organs and allow us to store calories to protect us from times when food is not available. Fats stay in the stomach longer than other foods, making us feel full. Fats are also important for keeping the body warm and they make food taste better.

A healthy, well-balanced diet includes adequate fat intake. For people with inadequate total energy intake, dietary fats are especially important for increasing energy intake to more adequate levels. For everyone, adequate fat is an important part of a healthy diet that meets individual energy and nutrient needs and takes into account appropriate levels of physical activity. Fat needs are usually expressed as a percentage of total energy needs, which depend on age and levels of physical activity.

The percentage of total energy (calories) that should come from fat in a healthy, balanced diet is:

- Infants 0–6 months: 40–60%
- Infants 6–24 months: gradual reduction to 35%
- Children 2–18 years: 25–35%
- Adults: 20–35%, with the higher limit for more active adults
- Pregnant and lactating women: 20–35%

Types and sources of fat

Dietary fats are found naturally in foods of both plant and animal origin. Almost all foods contain some fat, even if only very small amounts. Not all fats are the same, and there is increasing evidence that the type of fat in the diet has important effects on health and may be more important to health than the total amount of fat in the diet.

TO THINK ABOUT WHILE READING



Do you think fats are important in the diet?

What do you know about the different kinds of fats?

Do you know what foods have high amounts of fats?



The fatty acids in fats can be grouped into unsaturated fatty acids (including monounsaturated and polyunsaturated) and saturated fatty acids. Two of the polyunsaturated fatty acids we need cannot be made by the body and must come from the foods we eat; these are called “essential fatty acids”. Saturated fats and monounsaturated fats can be made by the body. Unsaturated fats are liquid at room temperature, while saturated fats are solid at room temperature. The fats we eat have a mixture of these different kinds of fatty acids, each of which has different effects on the body. Fats made from plant foods tend to have a higher proportion of unsaturated fatty acids. Animal fats (with the exception of some fish) tend to have a higher proportion of saturated fatty acids.

Unsaturated fatty acids

Two of the unsaturated fatty acids are called “essential fatty acids” because they are essential for health and because it is essential that we get them from the food we eat, since the body cannot make them. The body uses these essential fatty acids to make the others that it needs.

In this group of essential fatty acids, the omega-3 fatty acids have several important health benefits:

- help lower the risk of coronary heart disease and stroke
- reduce inflammation, which is helpful for asthma and reducing the effects of arthritis
- have a critical role in brain function and normal growth and development

Sources of monounsaturated fats are: canola oil; peanut oil; olive oil; avocados; nuts, such as almonds, hazelnuts and pecans; and seeds such as pumpkin and sesame seeds.

Sources of polyunsaturated fats are: sunflower oil; corn oil; soybean oil; flaxseed oil; walnuts, flaxseeds; and fish. Fatty fishes, including salmon, trout, mackerel, herring, sardines, pilchards, kipper, eel, whitebait, tuna, anchovies, swordfish, bloater, cacha, carp, hilsa, jack fish, katla and sprats, are rich in omega-3 fatty acids.

Saturated fatty acids

Saturated fatty acids are found in many animal foods and in some plants; they are also made by the body. Individual saturated fatty acids act differently in the body and may have different health effects. For example, high intakes of some animal fats may increase the risk of coronary heart disease, while red palm oil, coconuts and coconut oil, also saturated fats, do not increase the risk. (Red palm oil is also a good source of vitamins A and E). Replacing saturated fatty acids in the diet with monounsaturated or polyunsaturated fatty acids and consuming less than 10% of calories from saturated fatty acids (8% for children) is associated with a lower risk of cardiovascular disease.



Sources of saturated fatty acids are: foods from animal products, such as beef, pork, cheese, butter, ghee, lard, suet or other cooking fat from animal sources, whole milk, cream, fats from meat or meat products. Plant sources include coconut and red palm oil.

Transfatty acids

When vegetable oils are processed to make them harder, some of the fatty acids are changed into transfatty acids. Transfatty acids are present in margarine, shortening, other solid fats and in commercially fried and baked foods (such as biscuits, cakes, chips), where they are called “partially hydrogenated oils”. Transfats have been found to contribute to heart disease and may contribute to other health problems, such as diabetes. These fats and foods containing these fats should be avoided or consumed as little as possible (less than 1% of calories).

Cholesterol

Cholesterol is a fat-like substance that occurs naturally in animal foods; vegetables and vegetable products do not contain cholesterol. The body also makes it. We need some cholesterol for our bodies to grow and function properly. There are different kinds of cholesterol in the blood, including:

- HDL “good” cholesterol (high-density lipoprotein).
High levels of “good” cholesterol seem to reduce the risk of heart disease.
- LDL “bad” cholesterol (low-density lipoprotein).
High levels of “bad” cholesterol seem to increase the risk of heart disease.







Individual saturated fatty acids have different effects on the levels of good and bad cholesterol in the blood. Some saturated fatty acids may raise or lower cholesterol levels; others do not have any effect on it. For example, choosing foods with monounsaturated fatty acids and omega-3 fatty acids over saturated fatty acids is beneficial because unsaturated fatty acids tend to decrease the level of bad cholesterol. Choosing foods with transfatty acids over foods with saturated fatty acids is not beneficial, because transfatty acids decrease the level of good cholesterol and increase the level of bad cholesterol.

In general, it is recommended that:

- most of the fat in the diet comes from unsaturated fatty acids, including oils, seeds, nuts and fatty fish that provide omega-3 fatty acids;
- small amounts come from saturated fatty acids (less than 10% of calories in the diet for adults and 8% for children); and
- transfats and foods containing transfats (partially hydrogenated oil) be avoided or consumed as little as possible (less than 1% of energy).




MATERIALS

-  Fact sheet *Basic macronutrient facts: fats*
-  Ask yourself work sheet *Fats in my diet*
-  Answer work sheet *Fats in my diet*
-  Work sheet *What foods are high sources of fats?*
-  Work sheet *Fill in the gaps*
-  Match it work sheet *Macronutrients facts matching*



ACTIVITIES

Fats in my diet

-  Go to the Ask yourself work sheet *Fats in my diet* and fill in what you know about the different types of fats and the fats in your foods and diet. Check the Answer work sheet to see if your answers are correct.



Tip: Look for more information on fats in the Fact sheet Basic macronutrient facts: fats.

What foods are good sources of fats?



- Go through the list of foods in the Work sheet What foods are good sources of fats and underline or circle all those rich in fats. Use the Fact sheet Basic macronutrient facts: fats for more information on fats.

Fats poster



- Look at the Fact sheet Basic macronutrient facts: fats and make a list of all the fats and foods high in fats available in the diet and local markets. Collect as many pictures of these foods as possible. You can draw foods, take photos of them or cut out the illustrations from food labels, packages, newspapers or magazines.

Once you've collected the images, work all together or in groups and create a poster or a collage called "Main sources of fats". Divide your poster in three parts: Unsaturated fats; Saturated fats, Transfats.

If food labels are available with nutrient amounts listed, analyse the types and amounts of different fats listed on the label and rank foods with greater or lesser amounts.



Display the poster in your school next to the ones on carbohydrates and proteins created previously.

Fill in the gaps



If you are working individually, use the Work sheet *Fill in the gaps* as a test and see if you can correctly fill in the blanks.

If you are working in a group, copy the sentences and the words in the box on separate strips of paper or cards. Mix up the cards and, one at a time, come up and take one or more random cards until they are all distributed.

Walk around the room and try to match your cards. When you have filled in the blanks in the sentences with the correct words, form a pair and read aloud your statements to the rest of the group. Check the answer key to see if they are correct.

Macronutrients matching game



If you are working individually, go to Match it work sheet *Macronutrients facts matching* and see if you can match the facts with the correct macronutrient.

If you are working in a group, make three columns on a large sheet of paper or on the classroom board and write in the following three headings:

- A. Carbohydrates
- B. Protein
- C. Fats

Then on separate strips of paper or cards write each of the facts listed on the work sheet. Mix up the facts and distribute the fact strips until all facts are distributed.

Read out the fact strips one by one and place them under the macronutrients where you think they belong. Discuss and check the answer key to see if the placement is correct.

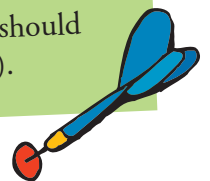


KEY POINTS

Review these five key points to remember about fats, their functions in the body and good food sources. See if you feel that your knowledge has improved and how you can apply it to your own diet and that of your family.

Fats

- Fats carry out many important functions in the body. They help the body absorb certain vitamins, produce hormones and build body tissues. Fats are important for the development of the brain and the central nervous system.
- Adequate fat is an important part of a healthy diet that meets individual energy and nutrient needs and takes into account appropriate levels of physical activity.
- Most of the fat in the diet should come from unsaturated fats, especially from seeds, nuts and fatty fish that provide omega-3 fatty acids.
- Small amounts should come from saturated fatty acids (less than 10% of calories in the diet for adults and 8% for children).
- Transfats and foods containing transfats (partially hydrogenated oil) should be avoided or consumed as little as possible (less than 1% of calories).



Basic macronutrient facts: carbohydrates

Nutrient

Carbohydrates

Carbohydrates provide the body's main source of energy (calories). Carbohydrates exist in three forms: sugar, starch and fibre.

Function

Provide energy needed by the body for activity, growth, body functions, maintenance and renewal of body tissues.

Food sources

Carbohydrates are found in many foods, but mainly foods from plants. Foods rich in carbohydrates are: rice, millet, maize, wheat, sorghum and other cereals; mealie meal, foods made from grains, such as breads, crackers, pastas and noodles; all types of starchy root crops, such as potatoes, yams, cassava; peas, beans and other legumes.

Sugar

Sugar is quickly absorbed into the body and used for energy. Excess consumption of sugar may contribute to overweight and obesity.

Provides a concentrated source of energy.

Sugar is found naturally in certain foods and saps of trees and is also made from the processing of sugar cane or beets. Sources are: fruits, fruit juices, milk, sweetened drinks, white and brown table sugar, honey, corn syrup and other syrups, molasses, baked cookies, cakes, candies and other sweetened foods.

Starch

Starch is broken down by the body into simple sugars to be absorbed.

Natural foods containing starch provide energy and offer more vitamins and minerals than simple sugars.

Wheat, rice, maize, oats, dry beans and peas, starchy roots and tubers, such as potatoes, yams and cassava; starchy fruits, such as breadfruit, banana, plantain, water chestnuts and sweet chestnuts.

Fibre

Fibre is a form that the body cannot digest and absorb. It absorbs water and helps get rid of the body's waste products.

Keeps the digestive system healthy, clean and functioning properly. Reduces blood cholesterol levels and normalizes blood sugar levels. Important for the prevention of certain diseases (cancer, heart disease, diabetes).

Whole grains, such as oats, barley, rye; brown rice; beans, chickpeas, lentils, nuts, most vegetables and fruits (especially with the peel).



You can look for more information on Fact sheet **Basic macronutrient facts: protein** and Fact sheet **Basic macronutrient facts: fats**



Carbohydrates in my diet

Fill in what you know
about the different types of
carbohydrate and
identify their role in your
food and diet.

1. How many forms of carbohydrate are found in plants?

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2. What are these forms?

.....

Sugar

3. What is the main function of sugar?

.....

4. What sugars and sugary foods or beverages do you eat or drink?

.....

.....

5. Which foods naturally contain sugar?

.....

.....

6. Which plants provide us with extracted (processed) sugars?

.....

7. What do all sugars and sugary foods and drinks have in common?

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8. Why should we not eat too much sugar or sugary foods?

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.....

9. Think about how much sugar or sugary foods you eat.

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10. What are the recommendations for consuming sugar and sugary foods?

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.....



★ You can check your answers on
Answer work sheet **Carbohydrates in my diet**

★ You can look for more information on
Fact sheet **Basic macronutrient facts: carbohydrates**

Starch

11. What are the sources of starch? What starchy foods do you eat?

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.....

12. What role do starchy foods play in the diet?

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.....

13. Think about how much of the total food you eat comes from starchy foods.

.....
.....

14. What are the recommendations for eating starchy foods?

.....
.....

Fibre

15. How is fibre different from the other carbohydrates?

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16. What types of fibre are there?

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17. What are good sources of fibre?

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18. What health problems can be prevented thanks to fibre?

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19. What happens to fibre during processing or refining?

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20. Think about how much fibre you eat.

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21. In which ways can you add more high-fibre foods to your diet and local recipes?

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.....





Carbohydrates in my diet

Questions

Answers

- | | |
|--|-------------------------|
| 1. How many forms of carbohydrate are found in plants? | Three |
| 2. What are these forms? | Sugar, starch and fibre |

Sugar

- | | |
|--|---|
| 3. What is the main function of sugar? | Concentrated source of energy. |
| 4. What sugars and sugary foods or beverages do you eat or drink? | These include: brown or white table sugar; honey; fruits; fruit juice; milk, corn syrup and other syrups, molasses, baked cookies, cakes, biscuits or other sweet desserts; soft drinks; candies, chocolate, jam, ice-cream and other sweetened foods |
| 5. Which foods naturally contain sugar? | Honey, milk, tree sap, fruits, especially bananas, prunes, dates, pineapples, oranges, grapes |
| 6. Which plants provide us with extracted (processed) sugars? | Sugar cane and sugar beet |
| 7. What do all sugars and sugary foods and drinks have in common? | They taste sweet and provide energy |
| 8. Why should we not eat too much sugar or sugary foods? | They are high in calories; eating large amounts may result in eating less of other foods higher in important nutrients. |
| 9. Think about how much sugar or sugary foods you eat. | Individual reflection |
| 10. What are the recommendations for consuming sugar and sugary foods? | It is recommended to limit consumption of concentrated sweets, but not of foods such as fruits or milk that naturally contain sugar |

Continued



★ Use this to check your answers to
Work sheet Carbohydrates in my diet

Questions

Answers

Starch

- | | |
|--|---|
| 11. What are the sources of starch? What starchy foods do you eat? | Grains (wheat, rice, corn/maize, oats, millet), legumes (dry beans and peas), roots and tubers (potatoes, yams, cassava); starchy fruits (breadfruit, banana, plantain, water chestnuts, sweet chestnuts) |
| 12. What role do starchy foods play in the diet? | They are major staple foods around the world, providing the main food source in the diet for most people. |
| 13. Think about how much of the total food you eat comes from starchy foods. | Individual reflection |
| 14. What are the recommendations for eating starchy foods? | It is recommended that starchy foods provide at least half of the calories in the diet. It is also recommended to eat starchy foods as "whole" unrefined foods whenever possible. |

Fibre

- | | |
|---|---|
| 15. How is fibre different from the other carbohydrates? | Fibre is not absorbed by the body and does not provide calories. It helps to "clean out" the digestive tract as it passes through the body. |
| 16. What types of fibre are there? | "Woody" fibre found in the hard stems of some vegetables and "gummy" fibre found in the peelings of fruits and vegetables. |
| 17. What are good sources of fibre? | Whole grains, such as oats, barley, rye; brown rice; starchy roots, peas, beans, chickpeas, lentils, nuts, oilseeds, most vegetables and fruits (especially with the peel). |
| 18. What health problems can be prevented thanks to fibre? | Fibre helps prevent constipation and may help prevent heart disease, diabetes and certain types of cancer. |
| 19. What happens to fibre during processing or refining? | Processing or refining can reduce the amount of fibre foods provide, and can also reduce the amount of vitamins and minerals they contain. |
| 20. Think about how much fibre you eat. | Individual reflection |
| 21. In which ways can you add more high-fibre foods to your diet and local recipes? | Individual reflection |



Carbohydrates facts matching

Can you correctly match some facts about carbohydrates?

- | | |
|---|--|
| <p>A. Starch</p> <p>B. Sugar</p> <p>C. Fibre</p> | <ol style="list-style-type: none"> 1. Used in food preservation 2. Staple food that fills us up 3. Cannot be digested or absorbed by the body 4. Provides the body's main source of energy 5. Helps the digestive system keep clean 6. Improves flavour and appearance of foods 7. May help prevent diseases such as heart disease, cancer and diabetes 8. A source of concentrated energy 9. It is recommended to eat fewer foods with high concentration of this 10. Absorbs water and helps get rid of body waste 11. Easily absorbed and used for quick energy 12. It is recommended to eat it unrefined |
|---|--|





Carbohydrates around the world

Choose a country located in each of the following regions: Africa, Asia, Europe, Middle East, North, Central and South America, Oceania. Conduct an investigation using any resources available to you and find out what staple foods are eaten in these countries. Use this table to record your findings.

Staple foods

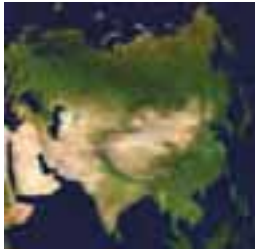
Traditional dishes or foods based on these staples

Africa



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Asia and the Pacific



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Europe



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Latin America and the Caribbean



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Staple foods

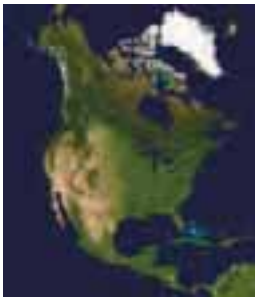
Traditional dishes or foods based on these staples

Middle East



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North America



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| • | • |
| • | • |

1. What kinds of staple foods are available in different regions of the world?
2. What are the most popular staple foods around the world?
3. Did you learn about any unusual foods that are not eaten in your country or region?
4. Do you eat a variety of all of the staple foods available in your country or region?
5. Can you include any new staple foods from the table in your diet?



Basic macronutrient facts: protein

Nutrient

Protein

Protein provides amino acids, called the “building blocks” of life, needed for basic body functions.

Function

Protein is essential for many basic body functions:

- helps in growth and development
- helps in building and repair of muscles, bones, organs, blood, skin, hair
- repair of damaged tissues due to illness or injury
- needed for the regulation of body fluids and hormones
- blood clotting
- helping the immune system fight disease.

Food sources

Found in both animal and plant foods, but best sources are animal foods, including all meats and offal, fish, chicken, eggs, animal milks, cheese and yoghurt. Good plant sources include groundnuts, soybeans, pumpkin seeds, dried beans, peas, medlies and lentils.



Reading this fact sheet will help you to complete Work sheet **Protein in my diet**, and Work sheet **Foods rich in protein**

You can look for more information on Fact sheet **Basic macronutrient facts: carbohydrates** and Fact sheet **Basic macronutrient facts: fats**



Protein in my diet

Fill in what you know about the importance of protein and protein in your diet and the foods you eat.

1. What are the functions of protein?

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2. Why is extra protein needed during periods of high growth such as pregnancy, infancy, childhood and adolescence?

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3. What protein foods do you eat?

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4. Do you think you get enough protein? Too much? Too little?

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5. Do you get your protein more from plant foods or from animal foods?

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6. Do you get your protein from a variety of different protein-rich foods?

.....

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7. How could you add different protein foods to your meals to be sure to meet your protein needs?

.....

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You can check your answers on the Answer work sheet **Protein in my diet**



Look for more information on Fact sheet **Basic macronutrient facts: protein**





Protein in my diet

Questions

1. What are the functions of protein?
2. Why is extra protein needed during periods of high growth such as pregnancy, infancy, childhood and adolescence?
3. What protein foods do you eat?
4. Do you think you get enough protein? Too much? Too little?
5. Do you get your protein more from plant foods or from animal foods?
6. Do you get your protein from a variety of different protein-rich foods?
7. How could you add different protein foods to your meals to be sure to meet your protein needs?

Answers

- It helps in growth and development; in building tissues and repairing damaged ones, in maintaining proper fluid regulation, and is also necessary for clotting blood and keeping the immune system strong to fight disease.
- To provide for the extra tissue developed during this time.
- May include: all meats, fish, chicken, eggs, animal milks, cheeses, yoghurt, groundnuts, soybeans, pumpkin seeds, dried beans, peas, mealies and lentils.
- Individual self reflection
- Individual self reflection
- Individual self reflection
- Eating even a small amount of an animal protein each day can provide the amino acids missing from plant foods.



★ Use this to check your answers to Work sheet Protein in my diet



Protein around the world

Choose a country located in each of the following regions: Africa, Asia, Europe, Middle East, North Central and South America, Oceania. Conduct an investigation by using any source available to you and find out what protein-rich foods are commonly eaten in these countries. Use this table to record your findings.

Protein-rich foods

Traditional dishes or foods rich in protein

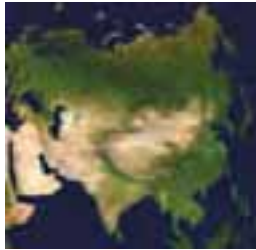
Africa



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Asia and the Pacific



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Europe



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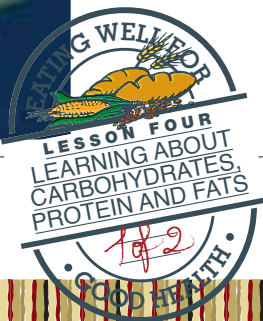
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Latin America and the Caribbean



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Protein-rich foods

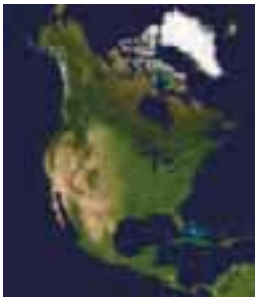
Traditional dishes or foods rich in protein

Middle East



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North America



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1. Which sources of protein are available in different countries and regions of the world?
2. What are the most popular protein-rich foods around the world?
3. Did you learn about any unusual foods that are not eaten in your country or region?
4. Do you eat a variety of protein-rich foods available in your country?
5. Can you include any new protein-rich foods from the table in your diet?



Basic macronutrient facts: fats

Nutrient

Fats

Fats provide a concentrated source of energy for the body and supply the essential fatty acids needed for growth and health. There are different kinds of fatty acids, each of which has a different effect on the body.

Unsaturated fats

Some of these have properties that make them beneficial to health, including reducing the risk of heart disease.

Saturated fats

High amounts of some of these increase the risk of heart disease; others do not.

Transfats

Contribute to heart disease and possibly to other health problems.

Function

- Help build cells, especially cells of the brain and nervous system.
- Are needed for the body to absorb, store and circulate vitamins A, D, E and K.
- Some fats help reduce the risk of heart disease.
- Provide insulation against cold.
- Protect internal organs and cells.
- Store calories to be used when food is scarce.

Food sources

Most vegetable oils such as, sunflower, linseed, flaxseed, groundnut and olive oil and other oils made from seeds, and groundnuts, soybeans, kidney beans, sunflower seeds, sesame seeds and other oil seeds, oily/fatty fishes such as salmon, sardines, trout, mackerel, herring and tuna; walnuts and avocados.

Butter, ghee, and other animal cooking fats, whole milk, cream, cheese, fats from meat and meat products, poultry. Also red palm oil and coconuts (that provide vitamins A and E and do not increase risk of heart disease).

Margarine and vegetable ghee, lard/cooking fat, fried foods, commercially fried and baked goods, cakes, biscuits.



You can look for more information

on Fact sheet **Basic macronutrient facts: carbohydrates** and Fact sheet **Basic macronutrient facts: protein**

Reading this fact sheet will help you to complete Work sheet **Fats in my diet** and Work sheet **What foods are high sources of fats?**

Fats in my diet

Fill in what you know about the different types of fats and identify them in your diet and in the foods you eat.

1. What are the functions of fats?
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2. What vitamins are absorbed, stored and circulated with the help of fats?
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3. Which body tissues are composed of fats?
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.....
4. How do fats protect us from times when food is not available?
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5. What foods do you eat that are high in fat?
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.....
6. What are the different types of fats?
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.....
7. What health benefits or health problems are associated with each type of fat?
.....
.....
8. Do you think you get enough fat? Too much? Too little?
.....
.....
9. How much of each type of fat do you have in your diet? Do you get more unsaturated, saturated or transfat?
.....
.....
10. What changes can you make in your foods and your meals to be sure you eat more "healthy" fats and meet your body's need for fat?
.....
.....



★ You can check your answers on Answer work sheet *Fats in my diet*

★ You can look for more information on Fact sheet *Basic macronutrient facts: fats*

Fats in my diet

Questions

1. What are the functions of fats?
2. What vitamins are absorbed, stored and circulated with the help of fats?
3. Which body tissues are composed of fats?
4. How do fats protect us from times when food is not available?
5. What foods do you eat that are high in fat?
6. What are the different types of fats?
7. What health benefits or health problems are associated with each type of fat?
8. Do you think you get enough fat? Too much? Too little?
9. How much of each type of fat do you have in your diet? Do you get more unsaturated, saturated or transfats?
10. What changes can you make in your foods and your meals to be sure you eat more "healthy" fats and meet your body's need for fat?

Answers

- Fats are used to build cells, manufacture hormones, help the body absorb and use certain vitamins. Fats protect our cells and internal organs and provide insulation against the cold. Some fats help protect the body from heart disease.
- Fat-soluble vitamins: A, D, E and K
- The brain and the central nervous system.
- They store calories to be used when food is scarce.
- May include: oils, groundnuts, soybeans, seeds, oily/fatty fishes such as salmon, sardines and tuna, walnuts and avocados, coconuts, butter, margarine, ghee, lard and other cooking fats, whole milk, cream, cheese, fats from meat and meat products, poultry, fried foods, commercially fried and baked goods, cakes, biscuits.
- Unsaturated, saturated and transfats.
- Some unsaturated fats (omega-3) can reduce the risk of heart disease. Transfats contribute to heart disease and possibly other health problems. High levels of "bad" (LDL) cholesterol may increase risk of heart disease.
- Individual self reflection
- Individual self reflection
- Most of the fat in the diet should come from unsaturated fats. Foods containing saturated fats should be eaten in limited quantities. Foods containing transfats should be avoided.



★ Use this to check your answers
to Work sheet **Fats in my diet**



Fill in the gaps

Can you fill in the gaps?
Complete each sentence
by choosing the correct
word from the box.

Liquid Solid Avoid Unsaturated Animal Trans

1. Saturated fats are at room temperature.
2. Most of the fat in the diet should come from fats.
3. Saturated fats are found primarily in foods.
4. Some fats have important health benefits.
5. Unsaturated fats are at room temperature.
6. fats contribute to heart disease.
7. People should eating foods containing transfats.
8. Fats made from plant foods tend to have a higher proportion of fatty acids.



Answer key: 1 solid; 2 unsaturated; 3 animal; 4 unsaturated; 5 liquid; 6 trans; 7 avoid; 8 unsaturated.

Macronutrients facts matching

How much have you learned about the macronutrients? See if you can match each fact with the correct macronutrient...

1. It should be at the basis of our diet
2. Called the "building blocks of life"
3. Forms cushions in the body, protects internal organs and provides insulation against cold
4. Plants make it from sunlight
5. Contains 9 calories per gram
6. Oil is made of this
7. Made up of amino acids
8. Fibre is a form of this
9. Meat is the major source of this
10. Help absorb the fat-soluble vitamins
11. Starch is a form of this
12. Butter is made of this
13. Important for growth and repair of tissues, keeping immune system strong and maintaining fluid balance
14. It is the most concentrated form of energy
15. Sugar is a form of this
16. It is the most calorie-dense nutrient

A. Carbohydrates

B. Protein

C. Fats



Answer key: 1A-2B; 3C; 4A; 5C; 6C; 7B; 8A; 9B; 10C; 11A; 12C; 13B; 14C; 15A; 16C.