

Topic 1

What it means
to be healthy
and well-nourished

**LEARNING OBJECTIVES**

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

- understand that poor diets lead to various forms of malnutrition, which have very serious health consequences for children, adolescents and adults;
- recognize and describe the signs and health effects of poor nutrition.

Lesson 3

Understanding problems of poor nutrition

LESSON OVERVIEW

This lesson is about the serious health problems caused by poor nutrition.

It explains how poor diets and infections can lead to different types of malnutrition.

It describes the diseases, illnesses and health problems that can result when people do not get enough food, the right variety of food, or when they eat more food than they need. It discusses the most common problems of poor nutrition and their effects on the body and provides descriptions of their signs and symptoms.

Part 1

Problems of undernutrition



READING

Poor diets and poor nutrition cause many different and very serious health problems and illnesses. Many of these problems handicap people for their entire lives; some of them lead to death. Diets that do not provide enough food to meet peoples' needs, that do not provide an adequate variety of foods or diets that provide more food than people need, can all lead to malnutrition. Malnutrition exists in some form in almost every country, affecting many millions of children and adults. Very poor diets usually lack both sufficient energy and many essential nutrients. Diets that provide enough or even too much energy can also be deficient in essential nutrients. Poor diets, when combined with poor health and frequent infections that affect the body's ability to digest and absorb enough nutrients to meet nutritional needs can lead to serious health and nutritional problems.

Almost one billion people in the world never get enough food to meet even their minimum energy and nutrient needs. Two hundred million children under five years of age suffer from acute or chronic malnutrition. Every year, an estimated 20 million infants are born with poor growth and development caused by poor nutrition during the mother's pregnancy (in the womb). Malnutrition in early life, including the period of growth in the womb, increases the risk of developing later in life chronic health conditions such as heart disease, diabetes and high blood pressure. Malnutrition is an important factor in the nearly 13 million children under five who die every year from preventable diseases and infections, such as measles, diarrhoea, malaria and pneumonia, or from some combination of these.

People who are undernourished are not able to lead healthy, active and productive lives. They have less energy to carry out normal everyday activities. They are less able to fight infections and become ill more easily and become more seriously ill, unable to recover adequately from an infection or illness. They often need medical care. Undernourished adults are less able to work, earn income and provide and care for themselves and their families. Children who are undernourished will not grow properly and are often too weak or sickly to attend school or to learn properly. For both adults and children, undernutrition commonly leads to much suffering and poor health, to lost human potential, a lower quality of life, stress to the family and the community and to increased expenses for medical care.

TO THINK ABOUT WHILE READING



What does the word undernutrition mean to you?

How many people in the world are chronically hungry?

What happens when growing children don't get enough food to meet their needs?



The most serious health problems resulting from undernutrition – not eating or being able to digest and absorb enough food to meet the body's needs – particularly in children, are described below.

Stunting

Childhood stunting – low height-for-age – affects between one-quarter (27%) and two-fifths (40%) of children under five years of age, most of whom are in developing countries. In communities where so many children are short for their age, stunting may not even be noticed, identified and addressed. Stunting results from continual poor nutrition (chronic undernutrition), including low energy and protein intakes, lack of essential vitamins and minerals, especially zinc, and repeated infections. Stunting indicates that the child is not getting enough food to eat or is not able to digest and absorb sufficient nutrients to meet its needs for growth. Continued poor nutritional status during periods of rapid growth, such as infancy and early childhood, are likely to result in permanent stunting.

Stunted children are also likely to be deficient in many nutrients, increasing the chances that they will also have other health problems and will suffer from chronic infections and diseases. Poor nutrition during pregnancy increases the risk of infant and childhood stunting and stunted females are at increased risk of problems with pregnancy and childbirth. Stunted adult women are likely to carry on the cycle of malnutrition by giving birth to low birthweight babies.

Wasting

Wasting – low weight-for-height – affects about 13% of children under the age of five in developing countries, many of whom are severely wasted. These children suffer the combined effects of poor diets and frequent infections and are at extremely high risk of death. Adults who suffer these same conditions are also at risk of wasting. When a child or adult is not able to eat, digest or absorb food sufficiently to meet their energy or nutrient needs, their body breaks down muscles and tissues to carry out essential body processes, resulting in a wasting away of almost all parts of the body. When wasting reaches the severe stage this critical energy is no longer available to support essential body functions, leading to death. Wasting in either children or adults indicates a serious nutritional problem and requires urgent attention to prevent death.

Low birthweight babies

Low birthweight is related to maternal undernutrition. When a pregnant woman is seriously undernourished, her baby is likely to grow and develop poorly in the womb and can be born underweight (2.5kg or less). Babies born underweight who continue to be undernourished are not able to catch up in growth after birth and are likely to suffer illnesses throughout their childhood and adolescence and into adulthood. Low birthweight babies are more likely to die in infancy.

Marasmus and Kwashiorkor

Two conditions reflecting a continued, severe lack of food in children in the first two years of life are marasmus and kwashiorkor. Both conditions result from a



severe lack of energy, protein and some essential vitamins and minerals. A child with marasmus (coming from the Greek word meaning “dying away”) experiences wasting of body fat, muscle and other body parts, and becomes extremely thin, underweight and highly at risk of infections. Eventually, the child is unable to digest and absorb food and to maintain other body processes, and the condition worsens. Kwashiorkor is sometimes referred to as “the illness that affects the first child when the second child is born” because the condition often results when a child is weaned from the breast when another new baby is born. Because complementary or weaning foods given to infants often consist only of cereals, kwashiorkor can occur when calories are sufficient but protein and essential vitamins and minerals in the food are very low. A child with kwashiorkor is underweight and will have frequent infections and illnesses; fluid imbalances will result in a noticeable swelling of the child’s feet and face.



MATERIALS



Match it work sheet *Undernutrition facts matching*



Fact sheet *Problems of poor nutrition and their signs and effects*



ACTIVITIES

Making the news

Group activity

Divide into several groups representing TV crews. Each crew is to choose one problem of undernutrition (stunting, wasting, low birthweight babies, marasmus, kwashiorkor) and prepare a 3-minute news report about this problem based on the information from the [Part 1 Reading](#) and any other information sources available. You can create a microphone for the reporter and a large frame to represent the TV screen. Role play the situation and when finished discuss the following questions:

- How common is this problem of undernutrition?
- Who is most affected by this problem?
- How many people are affected?
- How can you tell someone has it?
- Do you often hear on TV or radio the news about undernutrition in the world?
- What do you think and feel when you hear about problems of poor nutrition?



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- Why in the 21st century are one billion people chronically hungry?
- What is being done to change the situation?
- What can we do to change this situation?

If you are working individually, choose at least one problem of undernutrition (stunting, wasting, low birthweight babies, marasmus, kwashiorkor) to investigate, using the information from the Part 1 Reading and any other information sources available. Prepare a short, 3-minute news-style report about this problem and present it to friends and family.

Undernutrition facts matching



If you are working individually, go to the work sheet Undernutrition facts matching to see if you can correctly match some facts on problems of undernutrition.

If you are working in a group, write the undernutrition facts from the work sheet on strips of paper and put them in a hat. Sit in a circle, pass round the hat and select one piece of paper at a time. Read the fact to the rest of the group and try to guess what condition of malnutrition is described.



Look for prompts in the Fact sheet Problems of poor nutrition and their signs and effects. Check your answers on the work sheet.



KEY POINTS

Review these four key points to remember about undernutrition. Check your understanding of the serious health problems that result when people do not have enough food.

Problems of undernutrition

- People who are undernourished are not able to lead healthy, active and productive lives. They have less energy to carry out normal everyday activities. They are less able to fight infections and become ill more easily and become more seriously ill.
- Malnutrition in early life, including the period of growth in the womb, leads to many serious health problems and illnesses and causes many deaths from preventable diseases and infections.
- Undernourished children are at risk of slow or inadequate physical and mental growth and development and are likely to suffer illnesses throughout their childhood and adolescence and into adulthood.
- Undernourished women are likely to carry on the cycle of malnutrition by giving birth to undernourished, low birthweight babies.



Part 2

Problems from a lack of vitamins and minerals



READING

Diets that do not provide adequate amounts of essential vitamins and minerals (micronutrients) can lead to severe illness, permanent physical damage or death. People who are not able to meet their needs for calories are at risk of many micronutrient deficiencies. People whose diets are adequate in calories but are not sufficiently varied to cover all their nutrient needs can also suffer from deficiencies of important vitamins and minerals.

The most serious health problems resulting from micronutrient deficiencies – lack of essential vitamins and minerals in the diet – are described below.

Anaemia, caused primarily by lack of iron in the diet or by poor absorption of iron by the body, is one of the most serious and widespread health problems in the world. More than 2 billion people are affected by iron deficiency anaemia. Anaemia results in poor growth and development, lower resistance to infections leading to increased disease, and contributes to approximately 20 percent of deaths in pregnancy and childbirth. People with anaemia have less energy, are often tired and are less active. They are often sick, since they have reduced ability to fight infections. Anaemic children may have delayed mental and physical growth and development and less energy. A pregnant woman who has anaemia has a greater chance of giving birth to a low-birthweight infant, who will be less able to fight infection.

Anaemia can also be caused by lack of folate or vitamin B12 and by diseases such as malaria, hookworm infestations and sickle-cell disease. Menstruation and chronic loss of blood caused by ulcers and other internal bleeding can also lead to anaemia. Young children, adolescent girls, pregnant women and women of childbearing age, people who are often sick from malaria, HIV/AIDS, tuberculosis or worm infestations, and those who do not get enough iron from their food, especially already malnourished children, are particularly vulnerable to anaemia.

TO THINK ABOUT WHILE READING



What can happen when a person doesn't get enough vitamins and minerals?

Do you know how to prevent the health problems caused by lack of vitamin A, iron, iodine and other essential vitamins and minerals?



See [fact sheet on Iron deficiency \(Anaemia\)](#).

Mental retardation and brain damage can be caused by lack of iodine. Lack of sufficient iodine is the most common cause of preventable mental retardation and brain damage in the world. Up to two billion people may



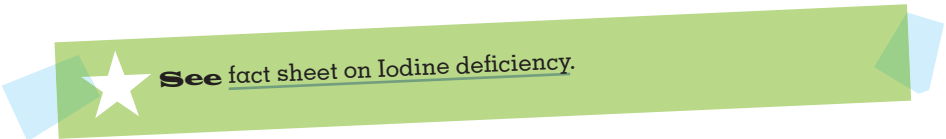
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be at risk of iodine deficiency because of lack of sufficient iodine. Millions of people suffer from the effects of permanent mental retardation because of iodine deficiency. In addition, millions of people suffer from goitre – a visible lump in the neck – caused by the swelling of the thyroid gland in response to insufficient iodine in the diet. Adequate iodine is necessary to produce the thyroid hormone, which is essential for normal growth, development and functioning of the brain and body. This hormone is also important for body processes such as converting food to energy, regulating growth and fertility and maintaining body temperature.

Lack of sufficient iodine during pregnancy can cause severe and irreversible physical and mental retardation in the unborn baby. Even a mild deficiency can cause health problems in children, including goitre, low intellectual capacity, growth problems, poor development and fatigue. In adults, lack of iodine can also cause a goitre to form and can lead to reduced mental function, infertility, impotence in men, low energy levels, weight gain and depression.

 **See** [fact sheet on Iodine deficiency](#).

Permanent blindness and other serious eye problems can be caused by lack of vitamin A. Vitamin A deficiency, resulting from inadequate quantities of vitamin A in the body, is the leading cause of preventable blindness. Between 200-300 million preschool children in developing countries are at risk of vitamin A deficiency. Every year, many thousands of children lose their sight because of vitamin A deficiency; many of these children die within one year of becoming blind. Lack of vitamin A can lead to serious eye problems, including: poor night vision; dry eyes and damage to the cornea (transparent covering of the eye) and eye nerve damage that can lead to permanent blindness. Lack of vitamin A can also damage the immune system, making it more difficult for the body to fight infections. Because vitamin A is important in bone formation, children with low levels of vitamin A may grow and develop poorly.

When the store of vitamin A in the body is low, and not enough foods that have vitamin A are eaten, a person will become vitamin A deficient. Diseases, illnesses and conditions such as measles, malaria, diarrhoea, malnutrition and low-fat diets also contribute to vitamin A deficiency, as they block the body's ability to absorb vitamin A and cause the body to lose or use up its stores of vitamin A quickly.

 **See** [fact sheet on Vitamin A deficiency](#).

Beri-beri is caused by a lack of thiamine (vitamin B1). Thiamine deficiency, in an acute or chronic form, can affect infants, children and adults. Long-term thiamine deficiency that can lead to beri-beri, causes severe weakness



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and fatigue, weight loss, progressive weakening and wasting of the muscles, emotional disturbances, pain in the limbs and paralysis, edema (swelling of body tissues) and heart failure. People most at risk of beri-beri are refugees, homeless people, alcoholics, prisoners and people in emergency situations. Thiamine will be insufficient in the breastmilk of women with thiamine deficiency, putting their infants at risk of developing infantile beri-beri, which is severe and often fatal.

Pellagra, a serious disease that can lead to death if untreated, is caused by lack of niacin (vitamin B3). Pellagra affects the mucous membranes (moist linings of the mouth and organs) and causes a variety of conditions commonly called “the three Ds”: dermatitis (patchy, flaky skin), diarrhoea and dementia (memory loss, confusion and depression). Niacin deficiency occurs among people whose diets are almost all maize or sorghum, with little variety and low protein. (However, traditional methods of soaking maize in lye help make the niacin in maize more available.) It also occurs among poor populations in remote areas in Asia or Africa, and among refugees, prisoners or others on diets with limited variety. Pellagra results when the diet is extremely deficient in niacin-rich foods (protein-rich foods). Certain other diseases or conditions, such as prolonged diarrhoea or cirrhosis of the liver from alcoholism, can also lead to pellagra.

Extremely serious birth defects of the spine and brain (called neural tube defects) are caused by lack of folate in early pregnancy. Folate (a B vitamin also known as folic acid) is important for the development of every cell in the body and is especially important during periods of rapid growth, particularly foetal growth. Women with folate deficiency who become pregnant are more likely to give birth to low birthweight and premature babies and babies with neural tube defects. Folate deficiency can also lead to anaemia. In infants, older children and adults, low folate levels can result in loss of appetite, weight loss, weakness, headaches, behavioural disorders and a form of anaemia, often in association with malaria.

A disease called scurvy is caused by lack of vitamin C. Vitamin C deficiency can cause problems with the immune system, resulting in infections and decreased resistance to disease. It causes problems with the formation of connective tissues and cell structure, leading to bleeding in gums and internal organs. It can eventually lead to scurvy, a disease resulting in spongy gums, soft and malformed bones, loose teeth, bleeding from the gums, nose and intestinal tract. Among people deficient in vitamin C, slow healing of wounds, anaemia and infections are common, leading to general weakness and fatigue. In severe deficiency, death from massive internal bleeding and heart failure can result. Extreme vitamin C deficiency is most likely to occur in refugee situations, during food emergencies and among prison populations, but milder forms of the deficiency occur when the diet has little variety of fruits and vegetables.



Increased risk of disease and poor growth and development can result from a lack of zinc. Zinc deficiency is considered to be among the leading risk factors for disease in developing countries, particularly among young children. For children under 5, zinc deficiency is estimated to be responsible for 13% of lower respiratory tract infections (mainly pneumonia and influenza), 10% of malaria episodes and 8% of diarrhoea episodes worldwide. Zinc deficiency is mainly caused by inadequate intake or absorption from the diet, and diarrhoea may be a contributing factor. Severe deficiency is rare, but mild to moderate is common throughout the world, with one-third of the world's population estimated to be at risk of zinc deficiency.

Zinc deficiency affects the immune system and can interfere with many organ systems, especially when it occurs during a time of rapid growth and development when nutritional needs are high, such as during infancy, childhood and pregnancy. Lack of zinc also damages the central nervous system and brain, creating developmental problems in children, such as impaired learning and motor functions. Hair loss, skin lesions, wasting of body tissues and poor functioning of eyesight, taste, smell and memory are also connected with zinc deficiency. Deficiency symptoms include severe growth retardation (dwarfism), problems with digestion and absorption causing diarrhoea, increasing the subsequent nutritional problems.

Poor bone growth, bone conditions and deformities can result from a lack of vitamin D. Vitamin D helps the body store the calcium it needs for bone growth and other important body functions. A lack of sufficient vitamin D can create a calcium deficiency. Rickets in children and osteoporosis in adults are conditions resulting from insufficient vitamin D. In children, vitamin D deficiency results in poor bone growth and soft, weak bones. It can result in spinal and rib cage deformities, bent legs or crippling, as the bones do not harden properly to support the child when it begins to stand. In extreme cases, the pelvis becomes deformed, which can cause problems in pregnancy for females when they reach their childbearing years. In adults, vitamin D deficiency reduces the density of the bones, causing increased fractures and broken bones. Low levels of vitamin D affect the immune system in both children and adults, decreasing their ability to fight infections. Vitamin D comes from only a few foods, but is made by the body with exposure to sunlight. Vitamin D deficiency occurs in people with limited sun exposure because of cold climates, excessive covering of the skin and use of high-protection sunscreen and among dark-skinned people.



For more information on the essential nutrients see [Lesson 4](#) and [Lesson 5](#).

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MATERIALS



Match it work sheet *Linking deficiencies with health problems*



Quiz work sheet *Lack of micronutrients: true or false?*



Quiz work sheet *Micronutrient deficiency facts*



Fact sheet *Iron deficiency anaemia*



Fact sheet *Iodine deficiency*



Fact sheet *Vitamin A deficiency*



Example work sheet *Good food sources of iron, iodine and vitamin A*



Fact sheet *Problems of poor nutrition and their signs and effects*



ACTIVITIES

Yes or No game

Group activity

Write the following problems from a lack of vitamins and minerals on separate strips of paper; fold them up and put them in a bag, a box or a hat.

Anaemia / Goitre / Brain damage / Blindness and other eye problems / Beri-beri / Pellagra / Neural tube defect / Scurvy / Rickets / Osteoporosis

Ask for a volunteer to pick one strip of paper out of the container and read it to himself or herself without letting the rest of the group see it. The group takes turns trying to guess the problem by asking the volunteer Yes or No questions. The volunteer is only allowed to reply Yes or No. If the answer is Yes, a person can ask another question. If the answer is No, it is the next player's turn to ask the question. The questions should be about causes and symptoms of the nutrition problems, and about the people who are most affected by these problems. For example:

- Is your problem caused by a lack of? (iodine, iron, vitamin C...)
- Are most affected? (new-born babies, pregnant women, the elderly...)
- Is a symptom of your problem? (paleness, swelling of the thyroid gland, poor vision...)

The first player to guess the problem wins.



Linking deficiencies with the problems they cause



Go to the Work sheet *Linking deficiencies with health problems* and see if you can link the vitamins and minerals with the health problems they can cause if people do not get enough of them from their food.

Lack of micronutrients: True or False?



Take a quick quiz to check your understanding of some basic facts about the health problems that can result from a lack of essential vitamins and minerals.

Micronutrient deficiency facts



Take this multiple-choice quiz to see what you have learned about problems of micronutrient deficiencies.

Exam role-play



Review the three fact sheets on *iron deficiency*, *iodine deficiency* and *vitamin A deficiency*. Split into two groups and pretend that one group are students taking their exam and another group is a board of professors, interrogating the students about these deficiencies. Role play the exam situation. For example, some of the questions on iodine deficiency may include:

What is iodine deficiency?

Who is at risk of iodine deficiency?

What causes iodine deficiency?

What are the effects of iodine deficiency in children? In pregnant women? In adults?

What are the signs of iodine deficiency?

How can it be prevented?

How can it be treated?

Can iodine be stored in the body for a long time?

What foods are good sources of iodine?

Iron, iodine or vitamin A?



Review the fact sheets on *iron*, *iodine* and *vitamin A* and find the information about good food sources of each one. Prepare a selection of foods containing these three micronutrients, using real foods, drawings, photos of foods or flash cards. Make sure the number of foods in each group is equal: for example, choose 10 iron food sources, 10 iodine foods and 10 foods containing vitamin A. Arrange the foods on a tray or a large sheet of paper and cover with a cloth or another large sheet of paper so that the group does not see it before beginning the game.

Divide the group into three teams: the first team is to identify and remember all the food sources of iron; the second team should do the same with iodine; and the third team should identify foods rich in vitamin A.



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Uncover the tray and show the foods to the group. Hold the foods up one by one, name them and put them back on the tray. Cover the tray and give each group a pen and a paper. Allow 5 minutes for:

- Team 1 to write the names of as many foods containing iron as they can remember
- Team 2 to write the names of as many foods containing iodine as they can remember
- Team 3 to write the names of as many foods containing vitamin A as they can remember



Check the lists all together and score one point for each correct food.

Campaign against anaemia and other deficiencies

Research and investigate how common deficiencies of iron, iodine and vitamin A are in your community. Information can be gathered from health care workers, clinics and hospitals to learn how many people and which groups of people in particular in the community suffer from health problems caused by these deficiencies.

Organize a communication campaign in your community to raise people's awareness of the health problems caused by micronutrient deficiencies. Create attractive, colourful and informative leaflets, posters, brochures or information booklets about these serious problems, using the information in the three fact sheets on anaemia, iodine deficiency and vitamin A deficiency and any information you have gathered from experts in the community. This can be done for all three of these deficiencies or for the deficiency that is most common in your community. When ready, present your communication products to the rest of the group, copy or photocopy them and display in public places or distribute to the people in your community.



KEY POINTS

Review these three key points to remember about the serious health problems that can happen if people lack essential vitamins and minerals in their diets. See if you can recognize the signs of these deficiencies.

Problems from a lack of vitamins and minerals (micronutrient deficiencies)

- Diets that do not provide adequate amounts of essential vitamins and minerals (micronutrients) can lead to severe illness, permanent physical damage or death.
- People whose diets are adequate in energy (calories) but are not sufficiently varied to cover all their nutrient needs can also suffer problems of deficiencies of important vitamins and minerals.
- Many of the most severe health problems caused by the three leading micronutrient deficiencies, such as mental retardation and cretinism (iodine), physical growth retardation and impaired reproductive functions (iron), and childhood blindness (vitamin A), could be greatly reduced by a good and varied diet that provides these essential micronutrients.

Part 3

Problems of “overnutrition”



READING

TO THINK ABOUT WHILE READING



What can lead
to overweight
and obesity?

What health
problems are
associated with
excessive
body weight
and fat?

Diets that provide more food energy (calories) than people need lead to overweight and obesity. Being overweight or obese can result in many physical disabilities and life-threatening health problems. Rates of overweight and obesity have increased around the world in all countries, as many people have decreased their activity levels and adopted less healthful eating habits. Many developing countries are experiencing major problems of both undernutrition and obesity, and their resulting health problems. Over 1 billion adults are overweight and 300 million are obese, and rates among children are rising rapidly. Obesity at an early age is a risk of increased likelihood of obesity in adulthood, certain serious diseases and shortened lives.

Obesity is an extreme form of overweight resulting from an accumulation of excessive amounts of body fat. Obesity is caused by an imbalance between the amount of energy in the diet and the amount of energy used through activity and body processes. Obesity increases the risk of chronic diseases including type 2 diabetes, hypertension (high blood pressure), stroke, heart disease, cancer, joint problems, gall bladder problems, decreased mobility and difficulty in breathing. The health consequences of these conditions range from premature death to disabilities that reduce quality of life. In addition, in cultures where obesity is not considered attractive, obese and overweight people often have lowered self-esteem and mental health problems and risk poor health through unhealthy eating patterns and dieting in order to lose weight.



MATERIALS



Work sheet *Problems related to obesity*



Quiz work sheet *Overweight and obesity: true or false?*



Fact sheet *Problems of poor nutrition and their signs and effects*

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ACTIVITIES

What problems are related to obesity?



Go to the Work sheet *Problems related to obesity* and underline those health risks and problems associated with excessive body fat. Use the Fact sheet *Problems of poor nutrition and their signs and effects* for information on obesity.

Overweight and obesity: true or false?



Take a quick quiz to check your knowledge of some basic facts about overweight and obesity.

KEY POINTS

Review these two key points to remember about the problems of "overnutrition" - eating more food than is needed. See if your understanding of what causes overweight and obesity, and the diseases and health problems associated with them, has improved.

Problems of "overnutrition" – overweight and obesity

- Eating more food than the body needs causes an excess accumulation of fat in the body, which leads to people becoming too fat. Overweight and obesity are caused by an imbalance between the amount of energy a person gets from food and the amount of energy the person uses for activity and body processes.
- People who are overweight or obese are at risk of many serious and life-threatening chronic diseases and disabilities, such as diabetes, high blood pressure, stroke, heart disease, some cancers, joint problems, gall bladder problems, decreased mobility and difficulty in breathing.



Undernutrition facts matching

Match the problems of undernutrition to their description (facts).

Problems

- A. Stunting
- B. Wasting
- C. Low birth weight
- D. Marasmus
- E. Kwashiorkor
- F. Malnutrition

Undernutrition facts

1. It exists in some form in almost every country, affecting many millions of children and adults.
2. A child with this condition often has pot belly, swollen feet and face, reddish hair and loss of hair.
3. A baby whose mother was seriously undernourished during pregnancy is at risk of this at birth.
4. This nutrition problem affects nearly one out of every three children under five years of age in developing countries.
5. When food is severely lacking the body uses muscles and tissues to support its processes, which results in this serious health condition.
6. These forms of severe malnutrition affect children under two years of age whose diets acutely lack protein, energy and some essential vitamins and minerals.
7. Girls who suffer from this condition are at increased risk of problems in pregnancy and childbirth when they grow up.
8. In communities where many children are short for their age, this condition can pass unnoticed and unaddressed.
9. The name of this disease comes from the Greek word meaning "dying away".
10. This is an important factor in the 13 million children under five who die every year from preventable diseases and infections.



Answer key: 1F; 2E; 3C; 4A; 5B; 6D; 7A; 8A; 9D; 10F.

You can look for more information in:
Fact sheet: Problems of poor nutrition and their signs and effects

Problems of poor nutrition and their signs and effects

Problem

Signs and effects on the human body

Undernutrition

Inadequate total food energy and nutrients

Loss of body weight; at risk to be deficient in multiple nutrients, with resulting health problems and illnesses. Over time, can lead to growth retardation, impaired motor skills, learning capacity and mental functioning, less resistance and high susceptibility to infections. In pregnant women, can result in low birthweight babies.

Stunting

Chronic undernutrition

Low height-for-age; at risk of deficiencies in multiple nutrients, with resulting health problems and illnesses. Failure to grow and develop to normal height; high susceptibility to chronic infections and diseases. In females, can cause reproductive problems and in pregnancy increases risk of infant and childhood stunting.

Wasting

Acute undernutrition

Low weight-for-height. Failure to grow and thrive, less resistance and high susceptibility to infections. Wasting of body fat and if continued over time, also wasting of muscle and other parts of the body. High risk of serious disease or death, if severe.

Marasmus

Chronic, severe undernutrition

Occurs mainly in the first 2 years of life. Extremely low body weight, wasting of body fat, muscle and other body parts. Inability to maintain body processes. Less resistance and high susceptibility to infections. Bulging abdomen.

Kwashiorkor

Acute, sudden lack of protein, energy and some micronutrients

Occurs mainly from 4–6 months to 2 years of age. Fluid imbalance and water retention, especially in the feet, skin ulcers (sores); fatty liver. Pot belly, swelling of the feet, body and face; loss of hair, reddish hair, peeling of skin and loss of skin pigmentation, anaemia. Irritability, loss of appetite and failure to grow and thrive; high susceptibility to infections and frequent illness.

Overweight and obesity

More food energy is consumed than expended

Excess body fat. Limited ability for normal movement and difficulties with physical activity. Increased risk of high cholesterol and high blood pressure; diabetes and heart problems.

Continued



★ Reading this fact sheet will help you complete Work sheet *Linking deficiencies with health problems* and Work sheet *Undernutrition facts matching*

Problem	Signs and effects on the human body
Parasites especially worm infestations	Fatigue and weakness; poor growth; diarrhoea and dehydration; reduced utilization of nutrients in foods; nutrient deficiencies.
Anorexia Deliberately eating too little	Deliberate low food intake, leading to significant weight loss and low weight for age and height. Low self-esteem and body image, feelings of inadequacy, anxiety, social dysfunction, depression, moodiness. Can cause delay in puberty, absent menstrual periods, hair loss, sleeping problems, low blood pressure, slow heartbeat, heart damage and infertility.
Bulimia Deliberate and excessive overeating and then purging	Compulsion to binge eat and then purge the body by self-induced vomiting or use of laxatives, leading to significant weight loss. Low self-esteem and body image, feelings of inadequacy, anxiety, social dysfunction, depression, moodiness. Can cause irregular heartbeat, chronic irregular bowel movements, inflammation of the esophagus, tooth decay, ulcers and pancreatitis.
Anaemia Iron deficiency	Learning difficulties; reduced resistance to infections; impairment of intellectual performance. General tiredness or weakness; headache, breathlessness and faster heartbeat following even normal physical activities. Paleness of inner eyelids, tongue, lips, skin and beneath the nails, swollen hands and legs, loss of appetite, dizziness, especially in pregnant women.
Vitamin A deficiency	Poor vision in dim light (night blindness), permanent total blindness, reduced resistance to infection, dryness of the inner eyelids, foamy spots on the eyes (Bitot spots), dryness, dullness or clouding of the cornea (transparent outer covering of the eye).
Iodine deficiency	Frequent illness; learning disabilities and problems in speaking (deaf-mutism); goitre (enlargement of the thyroid gland); grossly impaired mental development; impaired reproductive performance. Can result in permanent mental retardation.
Niacin deficiency (B₃)	Can result in Pellagra, a serious disease affecting the skin, gastro-intestinal tract and the nervous system. Red and itchy skin; nausea, vomiting, constipation, weakness, anxiety, depression. In severe cases, diarrhoea, delirium and dementia.

Continued



Problem**Signs and effects on the human body****Thiamin deficiency (B₁)**

Heart problems, muscle weakness, memory loss, poor food intake, weight loss. Prolonged deficiency results in Beri-beri, whose signs include: loss of appetite, weight loss, tiredness and weakness, heaviness and swelling of the legs; restlessness; breathlessness; increased pulse rate; heart failure, progressive weakness and wasting of the muscles, emotional disturbances.

Vitamin C deficiency

Problems with the immune system, resulting in frequent infections, increased susceptibility to disease and anaemia. Extreme deficiency can lead to scurvy, a disease affecting the gums, bones, teeth and intestinal tract, and to death from massive internal bleeding and heart failure. Signs include: painful joints and limbs; swollen and bleeding gums; slow healing or re-opening of wounds; brittle hair, pinpoint haemorrhages (small spots on the skin).

Vitamin D deficiency

Decreased ability to fight infections. In children, results in poor bone growth and spinal and rib cage deformities (rickets). In adults (osteoporosis), reduces bone density, leading to increased fractures and broken bones. Early signs: sleeplessness; nervousness; restlessness; loss of appetite. More developed signs: excessive sweating; swollen wrists and ankles; swelling of the ribs; protuberant abdomen; bowing of the legs.

Folate deficiency

In pregnancy, results in extremely serious birth defects of the spine and brain in the infant and low birthweight babies. In adults can result in a form of anaemia. In infants and young children can slow growth. Loss of appetite, weight loss, weakness and tiredness. Paleness of inner eyelids and beneath nails; tiredness, headaches, breathlessness, neurological disturbances.

Zinc deficiency

Interferes with many organ systems, especially during infancy, childhood and pregnancy. Growth retardation; damage to central nervous system and brain. Impaired learning and motor functions, hair loss, skin lesions, wasting, poor eyesight, poor digestion.



Linking deficiencies with health problems

Do you know enough?
Try to match
vitamin and mineral
deficiencies in the
left column with the
health problems they
can cause if people do
not get enough of them
from their food.

Deficiency

1. Lack of iron
2. Lack of iodine
3. Lack of folate
4. Lack of zinc
5. Lack of vitamin A
6. Lack of thiamine (B₁)
7. Lack of niacin (B₃)
8. Lack of vitamin C
9. Lack of vitamin D

Health problem or disease

- Pellagra
- Scurvy
- Anaemia
- Rickets and osteoporosis
- Serious eye problems and blindness
- Beri-Beri
- Severe growth retardation (dwarfism)
- Mental retardation, brain damage and goitre
- Neural tube defects (serious birth defects)



You can look for more information on
Fact sheet **Problems of poor nutrition and their signs and effects**

Answer key: 1 Anaemia; 2 Mental retardation, brain damage and goitre; 3 Neural tube defects; 4 Severe growth retardation (dwarfism); 5 Serious eye problems and blindness; 6 Beri-Beri; 7 Pellagra; 8 Scurvy; 9 Rickets and osteoporosis.

Lack of micronutrients: true or false?

How much do you know about the micronutrients? See if you can answer correctly each of these statements.

	True	False
1. Vitamin D deficiency occurs in people with little sun exposure.	<input type="checkbox"/>	<input type="checkbox"/>
2. Folate is especially important in older age.	<input type="checkbox"/>	<input type="checkbox"/>
3. Anaemia is caused by lack of iodine.	<input type="checkbox"/>	<input type="checkbox"/>
4. Vitamin D deficiency can lead to rickets in children and osteoporosis in adults.	<input type="checkbox"/>	<input type="checkbox"/>
5. Pellagra occurs among people whose diets are almost wholly based on vegetables and fruits.	<input type="checkbox"/>	<input type="checkbox"/>
6. Iodine cannot be stored for long in the body, so small amounts of it must be eaten regularly.	<input type="checkbox"/>	<input type="checkbox"/>
7. Lack of iron can cause mental retardation, brain damage and goiter.	<input type="checkbox"/>	<input type="checkbox"/>
8. Women with folate deficiency are more likely to give birth to babies with serious defects of the spine and brain.	<input type="checkbox"/>	<input type="checkbox"/>
9. Lack of vitamin A can lead to permanent blindness.	<input type="checkbox"/>	<input type="checkbox"/>
10. People most at risk of thiamine and niacin deficiencies are refugees, prisoners and alcoholics.	<input type="checkbox"/>	<input type="checkbox"/>
11. Mental retardation and brain damage caused by lack of iodine are preventable but not curable.	<input type="checkbox"/>	<input type="checkbox"/>
12. Anaemic people are active and full of energy.	<input type="checkbox"/>	<input type="checkbox"/>
13. Beri-beri and pellagra can lead to death if untreated.	<input type="checkbox"/>	<input type="checkbox"/>
14. Zinc deficiency is among the leading risk factors for disease in developing countries.	<input type="checkbox"/>	<input type="checkbox"/>



You can look for more information on
Fact sheet **Problems of poor nutrition and their signs and effects**

Answer key: 1 True; 2 False; 3 False; 4 True; 5 False; 6 True; 7 False; 8 True; 9 True; 10 True; 11 True; 12 False; 13 True; 14 True

Micronutrient deficiency facts

How much have you learned about the problems of micronutrient deficiencies? Take this quick multiple choice exercise and test your knowledge.

1. **Lack of what micronutrient causes anaemia?**
 - A. Iodine
 - B. Iron
 - C. Zinc
 - D. Vitamin A

2. **What percentage of deaths in pregnancy and childbirth does anaemia contribute to?**
 - A. About 1%
 - B. About 10%
 - C. About 15%
 - D. About 20%

3. **How many people worldwide are affected by or at risk of iron deficiency?**
 - A. Over 2.5 million
 - B. Over 20 million
 - C. Over 200 million
 - D. Over 2 billion

4. **Who is particularly vulnerable to anaemia?**
 - A. Small children
 - B. Adolescent girls and women of childbearing age
 - C. People with malaria, HIV/AIDS, worm infestations, tuberculosis
 - D. People who do not eat enough iron-rich foods
 - E. All of the above

5. **How many people lack sufficient iodine and risk iodine deficiency?**
 - A. 200 thousand people
 - B. 2 million people
 - C. 200 million people
 - D. 2 billion people

6. **What is goitre?**
 - A. An eye nerve damage that leads to blindness
 - B. A neural tube defect
 - C. A visible lump in the neck caused by the thyroid gland swelling in response to lack of iodine
 - D. Internal bleeding which can lead to anaemia

Continued



You can look for more information on **Problems of poor nutrition and their signs and effects** Fact sheet

7. What health problems can be caused by the lack of vitamin A?

- A. Memory loss
- B. Serious eye problems and total blindness
- C. Weight gain
- D. Diarrhoea

8. How can vitamin A deficiency be prevented?

- A. Through a healthy, well-balanced diet containing foods rich in vitamin A.
- B. By consuming foods fortified with vitamin A.
- C. Through supplements when vitamin A-rich foods are not available.
- D. By early treatment of pneumonia, diarrhoea, measles, malnutrition and malaria.
- E. By all of the above

9. What is a common name for conditions caused by pellagra?

- A. "The three Ms": measles, malaria, mental retardation
- B. "The three Es": edema, emotional disturbances, eye infections
- C. "The three Ds": dermatitis, diarrhoea, dementia
- D. "The three Hs": hair loss, headache, hookworm

10. What are the signs of scurvy?

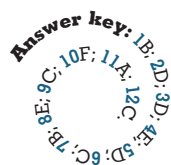
- A. Bleeding from the gums and internal organs
- B. Loose teeth
- C. Soft and deformed bones
- D. Slow healing of wounds
- E. Brittle hair
- F. All of the above

11. How many people in the world are at risk of zinc deficiency?

- A. One-third of the population
- B. One-half of the population
- C. One-quarter of the population
- D. One-fifth of the population

12. What health problems can be caused by the lack of vitamin D?

- A. Poor eyesight
- B. Cirrhosis of the liver
- C. Poor bone growth and soft, weak bones
- D. Poor digestion



Iron deficiency anaemia

Anaemia is a serious health and nutritional problem caused by lack of iron in the diet or poor absorption of iron. Anaemia can also be caused by lack of folate or vitamin B₁₂ and by diseases such as malaria, hookworm infestations and sickle-cell disease. Menstruation and chronic loss of blood caused by ulcers and other internal bleeding can also lead to anaemia. Iron deficiency anaemia can result in poor growth and development, low resistance to disease, poor reproductive functions, increased illness and contributes to deaths in pregnancy and childbirth.

What is anaemia?

- Anaemia, also referred to as “weak”, “thin” or “pale” blood, is a condition resulting from a low level of haemoglobin (substance that makes blood red) in the blood. Sufficient levels of haemoglobin are needed in the blood to carry oxygen through the body, allowing the body to move and function properly.

Who is at risk of anaemia?

- Pregnant women
- Women of childbearing age
- Adolescent girls
- Children below 12 years
- A person who is frequently sick, especially from malaria, HIV/AIDS, TB, worm infestations
- People who do not eat enough iron-rich foods
- Malnourished children

What causes anaemia?

- Lack of iron is the most common cause of anaemia. Other nutritional causes of anaemia are lack of folate, vitamin B₁₂ and vitamin A.
- Malaria, which damages the red part of the blood where iron is stored, is a cause of anaemia.
- Hook worm infestations, which suck blood from the intestine.
- Increased loss of blood (heavy bleeding) causes anaemia.
- Other infections, such as HIV/AIDS and sickle-cell disease.

Continued



What are the effects of anaemia?

- People suffering from anaemia feel tired and lack energy; this tiredness is often more intense than the tiredness caused by a simple lack of sleep. The results of anaemia include frequent tiredness or weakness, headaches, pale skin colour, poor resistance to cold temperatures and a tendency to be less active.
- Anaemia reduces resistance to disease and ability to fight infections, which can lead to more frequent illness.
- Anaemia can impair reproductive functions.
- Anaemic children:
 - may have delayed physical and mental growth and development
 - have less energy to play, learn and develop.
- Pregnant women with anaemia:
 - have an increased risk of dying during and after pregnancy
 - have an increased risk of giving birth to a low birthweight infant who has low ability to fight infection.
- Anaemia reduces people's capacity to engage in physical work, as well as mental productivity, often reducing families' productive economic activities.

How can you tell someone has anaemia?

A person who has anaemia may have some or all of the following signs:

- general feeling of tiredness or weakness
- headache
- breathlessness (short breath) and a faster heartbeat
- pale or whitish tongue and inside of the lips
- pale inside the lower eyelid
- swollen legs and hands
- loss of appetite
- desire to eat peculiar substances such as dirt or ice
- dizziness, especially in pregnant women.

How can we prevent anaemia?

- Eating iron-rich foods and vitamin C-rich foods every day.
- Adding iron-rich foods (well-cooked and mashed) to babies' diets after they are 6 months old, in addition to breastmilk.
- In pregnancy, when the need for iron is especially high, taking iron and folic acid tablets regularly and increasing the amount of iron-rich foods in the diet.
- Spacing pregnancies helps give a woman's body enough time to build up good iron stores, thus protecting the woman from anaemia.
- Protection against hookworm infections, malaria and other causes of anaemia.
- Early detection and treatment of any infection in a person.
- Protecting against malaria by sleeping under a treated mosquito net.



Continued

How can we treat anaemia?

- Treatment of anaemia depends on the age and overall health of the person and on the cause and degree of anaemia. Anaemia is best treated through improving the diet by eating more iron-rich foods (see list of Good food sources below).
- In certain cases, additional iron supplements are required to treat anaemia.
- During pregnancy and breastfeeding, in addition to eating more iron-rich foods, iron tablets, folic acid and other micronutrient supplements are needed to treat and prevent anaemia; a doctor or other health care provider should be consulted.
- Proper diagnosis, treatment and management of hookworm, malaria and other parasitic diseases that cause anaemia are often needed to treat anaemia.

Good food sources of iron

- Animal foods
 - beef
 - pork
 - lamb
 - liver and other organs
 - poultry: chicken, duck, turkey (especially the dark meat)
 - eggs (medium source)
- Seafoods
 - fish
 - shellfish: clams, mussels, oysters
- Plant foods
 - dark leafy greens: broccoli, spinach, kale, turnip greens, collards
 - legumes: beans, peas, lentils
 - dried fruits
- Some fruits increase the body's ability to absorb iron in foods. These are fruits such as oranges, lemons, guava, mangos and some wild fruits that contain vitamin C. Eating these fruits together with iron-rich plant foods or adding their juices to vegetables improves iron absorption.
- Tea (with caffeine) may impair iron absorption and should not be taken during meal times.



Reading this fact sheet will help you to complete
 Work sheet **Linking deficiencies with health problems**,
 Work sheet **Lack of micronutrients: true or false?**
 and Work sheet **Micronutrient deficiency facts**

Iodine deficiency

Iodine is needed for the proper functioning of the thyroid gland, which helps control the way the body works. Iodine is essential for the normal growth, development and functioning of the brain and body. Lack of sufficient iodine is the most common cause of preventable mental retardation and brain damage in the world.

What is iodine deficiency?

- Iodine deficiency is a condition that results from low or insufficient amounts of iodine in the body. Adequate iodine intake is necessary for the production of the thyroid hormone, which is essential for the normal growth, development and functioning of the brain and body. It is also important for body processes such as converting food to energy, regulating growth and fertility and maintaining body temperature.
- When the body becomes iodine deficient, both physical and mental development are damaged. Even a mild deficiency can cause health problems, including an increased risk of stillbirths (babies born dead), infant deaths and low intellectual capacity. Severe iodine-deficiency results in irreversible mental retardation, deafness and a loss of muscle control and physical movement.
- Iodine cannot be stored for long in the body, so small amounts of iodine must be consumed regularly.

Who is at risk of developing iodine deficiency?

- People of any age who live in mountainous and remote inland areas, or in other areas where food is grown in soil that does not contain sufficient iodine and where there are no adequate iodine fortification programmes
- Pregnant and breastfeeding women
- Infants and children

What causes iodine deficiency?

- Iodine deficiency is caused by a diet that does not contain enough foods rich in iodine to meet the body's needs.

Continued



What are the effects of iodine deficiency?

- In children, lack of iodine can lead to:
 - mental retardation
 - loss of muscle control and physical movement
 - failure to grow properly
 - frequent infections and illness
 - learning difficulties
 - hearing and speaking problems (deaf-mutism)
- In pregnant women, lack of iodine can lead to:
 - miscarriage (losing the baby before it is developed and ready to be born)
 - stillbirths (babies born dead)
 - infant deaths
 - poor development of the baby
 - babies born with irreversible mental retardation, growth failure, speech and hearing defects
- In adults, lack of iodine can lead to:
 - reduced mental function
 - infertility
 - impotence in men
 - heart failure
 - goitre, or hypothyroidism, a condition that can result in low energy levels, loss of sensation in the legs and other body extremities and other health problems

How can you tell someone has iodine deficiency?

Some of the mild signs of iodine deficiency may not be noticed or may resemble other illnesses or health conditions. A person who has iodine deficiency may have some or all of the following signs:

- low energy levels, tiredness, fatigue
- dry or scaly or yellowish skin
- dry, coarse hair
- tingling and numbness in extremities
- muscle cramps
- swelling of the legs
- weight gain
- forgetfulness
- personality changes or depression
- anaemia, and prolonged and heavy periods in women
- goitre (a swelling of the thyroid gland) is visible in the neck between the Adam's apple and the collar bone.

Continued



How can iodine deficiency be prevented?

- Iodine deficiency can be prevented by eating a balanced diet that contains foods rich in iodine (see Good food sources below).
- In areas where the soil is poor in iodine and iodine-rich foods are not available, consuming foods fortified with iodine (usually salt) or taking iodized oil supplements will help prevent iodine deficiency.
- Women who are pregnant, or thinking about becoming pregnant, or breastfeeding may benefit from taking iodine supplements if iodine-rich foods or iodized salt are not available; a doctor or other health care provider should be consulted.

How can iodine deficiency be treated?

- Effective treatment of iodine deficiency depends on early identification and treatment under the care of a doctor. Mental retardation and brain damage caused by iodine deficiency is preventable but not curable.

Good food sources of iodine

- The iodine content of most foods depends on the iodine content of the soil in which plant foods grow or on which animals graze.
- Seafood is rich in iodine:
 - saltwater fish
 - seaweed/sea vegetables, such as kelp, dulse, wakame
 - white deep-water fish
 - sea salt
 - cod liver oil
- Plant sources:
 - lima beans
 - soybeans
 - spinach
 - turnip greens
 - some squashes
 - sesame seeds
 - asparagus
 - mushrooms
 - garlic
- Fortified sources
 - iodized salt



★ Reading this fact sheet will help you to complete
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Vitamin A deficiency

Vitamin A is needed for building and maintaining healthy tissues throughout the body, particularly the eyes, skin, bones and tissues of the respiratory and digestive tracts, and for the immune system, which helps prevent or fight off infections. Most of the health consequences of vitamin A deficiency can be prevented through a healthy, well-balanced diet rich in vitamin A.

What is vitamin A deficiency?

- Vitamin A deficiency is a condition that results from inadequate quantities of vitamin A in the body. Lack of vitamin A (vitamin A deficiency) can damage the immune system, making people more likely to suffer from infections. Severe vitamin A deficiency can lead to eye problems, poor vision and irreversible blindness. Vitamin A deficiency is the major cause of blindness in children.
- The body can store vitamin A so that there is a reserve when we need it. When the store of vitamin A in the body is low, and not enough foods that have vitamin A are eaten, a person will become vitamin A deficient.

Who is at risk of developing vitamin A deficiency?

- Newborn babies who are not given colostrum (first breastmilk)
- Infants who are not breastfed
- Infants born or breastfed from mothers with vitamin A deficiency
- Infants born with very low weight (under 2.5 Kilos)
- Children between 6 months and 6 years of age
- Children who are malnourished and suffer from measles, diarrhoea and other infections
- School-age children, pregnant adolescent girls and elderly people
- People of any age who are malnourished and do not have a diet rich in vitamin A

What causes vitamin A deficiency?

- Vitamin A deficiency is caused by a poor diet that does not contain enough foods rich in vitamin A to meet the body's needs.
 - Oil or fat in the diet is needed to help the body absorb vitamin A from foods.
- It is also caused by measles, diarrhoea and other infections and repeated illnesses that block absorption and cause the body to lose or use up stores of vitamin A more quickly.

Continued



What are the effects of vitamin A deficiency?

- Eye problems, poor vision and in severe cases, permanent blindness.
- Diseases of the respiratory and digestive systems.
- Repeated illnesses, because the body's defence mechanism is low, and general poor health.
- Poor growth and development in children.

How can you tell someone has vitamin A deficiency?

- A person who suffers from vitamin A deficiency may have some or all of the following signs:
 - poor vision, especially in poor or dim light
 - dryness of the lining of the eye
 - whitish soapy patches on the outer white part of the eye
 - lesions or damage to the cornea (the transparent outer covering) of the eye

How can vitamin A deficiency be prevented?

- Vitamin A deficiency can be prevented through a healthy, well-balanced diet containing foods rich in vitamin A and fat, which is needed for the body to absorb vitamin A.
- Consuming foods to which vitamin A has been added (fortified).
- Supplements of vitamin A (in the form of pills or tablets) when vitamin A-rich foods are not available.
- Early detection and treatment of conditions such as pneumonia, diarrhoea, measles, malnutrition and malaria.

How can vitamin A deficiency be treated?

- Effective treatment of vitamin A deficiency depends on early identification of the problem. Blindness caused by severe vitamin A deficiency is preventable but not curable.
- Treatment of severe vitamin A deficiency:
 - A child with any signs of eye problems, such as night blindness (chicken eyes) or dry eyes, needs urgent medical attention and vitamin A supplements.
- People suffering from vitamin A deficiency need to eat foods rich in vitamin A and foods fortified with vitamin A. (see Good food sources below)
- Proper treatment of diarrhoea, malnutrition, measles, malaria and tuberculosis.

Continued

Good food sources of vitamin A

- Plant foods rich in vitamin A:
 - dark green leafy vegetables such as cassava leaves, pumpkin leaves, bean leaves, sweet potato leaves, amaranthus, spinach, broccoli, kale
 - orange and yellow vegetables such as pumpkins and carrots
 - orange coloured fruits like mangoes, papaya and pawpaw (citrus fruits like oranges, lemons, mandarins do not contain vitamin A)
 - yellow/orange sweet potatoes, yellow maize and yellow/red sweet peppers
 - red palm oil
- Animal foods rich in vitamin A:
 - liver
 - kidneys
 - small fish eaten whole
 - fish oils
 - egg yolks
 - breastmilk (especially colostrum)
 - fortified milk, butter and cheese
- Some foods, usually sugar, are fortified with vitamin A (have added vitamin A).
- Foods can be enriched with vitamin A in the home by adding palm oil to leafy green vegetables and to foods such as porridge, rice, all kinds of relishes, cassava and sweet potatoes.



Reading this fact sheet will help you to complete
 Work sheet **Linking deficiencies with health problems**,
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Good food sources of iron, iodine and vitamin A

(Team 1)

Iron:

- Beef
- Pork
- Lamb
- Liver and other organs
- Poultry: chicken, duck, turkey
- Eggs
- Fish
- Clams
- Mussels
- Oysters
- Dark leafy greens
- Broccoli
- Spinach
- Kale
- Turnip greens
- Collards
- Beans
- Peas
- Lentils
- Dried fruits

(Team 2)

Iodine:

- Saltwater fish
- Seaweed such as kelp, dulse, wakame
- White deep-water fish
- Sea salt
- Iodized salt
- Cod liver oil
- Lima beans
- Soybeans
- Spinach
- Turnip greens
- Some squashes
- Sesame seeds
- Asparagus
- Mushrooms
- Garlic

(Team 3)

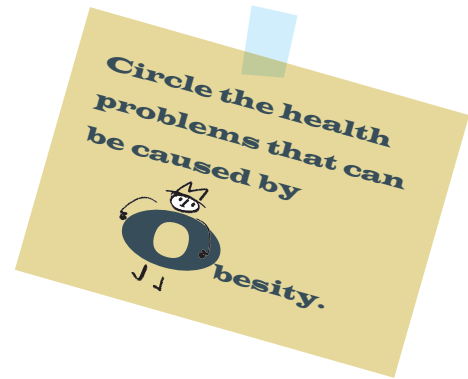
Vitamin A:

- Dark green leafy vegetables
- Cassava leaves
- Pumpkin leaves
- Bean leaves
- Sweet potato leaves
- Amaranthus
- Spinach
- Broccoli
- Kale
- Pumpkins
- Carrots
- Mangoes
- Papaya/pawpaw
- Sweet potatoes
- Maize
- Yellow/red sweet peppers
- Red palm oil
- Liver
- Kidneys
- Small fish eaten whole
- Fish oils
- Egg yolks
- Breastmilk (especially colostrum)
- Fortified milk
- Butter and cheese

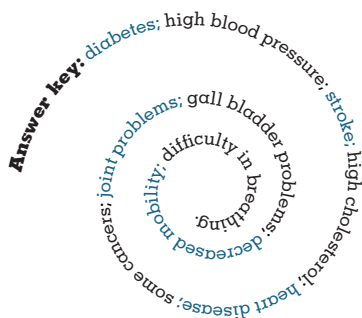




Problems related to obesity



- blindness
- diabetes
- marasmus
- high blood pressure
- scurvy
- neural tube defects
- high cholesterol
- stroke
- heart disease
- wasting of the muscles and tissues
- joint problems
- some cancers
- decreased mobility
- mental retardation
- gall bladder problems
- dwarfism (severe growth retardation)
- difficulty in breathing
- pellagra
- kwashiorkor



Overweight and obesity: true or false?

Take this quick
quiz to test your
knowledge.

	True	False
1. Eating less food (calories) than we need for physical activity and body processes leads to overweight and obesity.	<input type="checkbox"/>	<input type="checkbox"/>
2. There are fewer overweight and obese people around the world today than in the past.	<input type="checkbox"/>	<input type="checkbox"/>
3. Obesity does not result in any life-threatening health problems and physical disabilities.	<input type="checkbox"/>	<input type="checkbox"/>
4. Over 1 billion people in the world are overweight.	<input type="checkbox"/>	<input type="checkbox"/>
5. Over 300 million people are obese.	<input type="checkbox"/>	<input type="checkbox"/>
6. The rate of obesity among children is rapidly increasing.	<input type="checkbox"/>	<input type="checkbox"/>
7. Obesity can shorten a person's life.	<input type="checkbox"/>	<input type="checkbox"/>
8. Obesity is an extreme form of overweight.	<input type="checkbox"/>	<input type="checkbox"/>



Answer key: 1 False; 2 False; 3 False; 4 True; 5 True; 6 True; 7 True; 8 True