CONTENTS

1 The Relationship between Food and Health

aims

- To define the term 'food'.
- To list the functions of food.
- To identify factors affecting food choices and eating habits

What is food?

Food is any solid or liquid that provides nutrients to the body. Food is made up of protein, fats, carbohydrates, vitamins, minerals and water.

Functions of food

key point

Good eating patterns are linked to good health.

- To help the growth and repair of body cells.
- To provide the body with fuel (heat and energy).
- To protect the body against disease.
- To regulate body functions, e.g. temperature, breathing and digestion.

Factors affecting food choices and eating habits

- Family budget (cost/income)
- Special dietary requirements or restrictions
- Nutritional value
- Lifestyle/eating patterns (parents, family and friends)
- HL Cultural or religious background
- Where we live (city, countryside, islands)
- Availability of different foods
- Knowledge of healthy eating
- Age (likes and dislikes at different ages)

- Our senses (sight, smell, taste, touch)
- Advertising.

EXAM QUESTION AND SAMPLE ANSWER

HL

Higher Level, Section A

Suggest **four** factors that influence a person's food choices. (4 marks)

- *Special dietary requirements or restrictions.*
- *Nutritional value.*
- *Family budget (cost/income).*
- *Parents, family and friends (lifestyle).*

exam focus

Read the questions very carefully. Always take note of the **number of factors or examples** required and the **marks** allocated to the question.

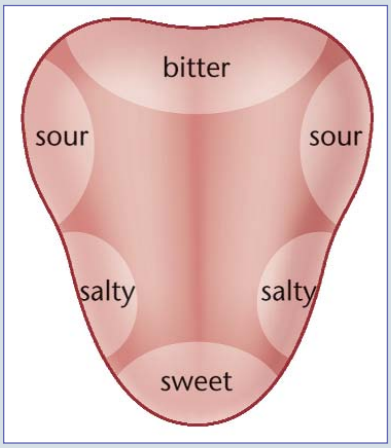
Higher Level, Section A

Draw a diagram of the tongue and mark in the location of the taste buds and what flavour they taste. (4 marks)

Example 1:

List the **four** tastes that can be sensed by the taste buds on the tongue. (4 marks)

1. *Sweet*, 2. *Bitter*, 3. *Sour*, 4. *Salty*



Example 2:

Name the staple foods of the following countries: China, India, Italy, Ireland. (4 marks)

China: *Rice*

India: *Rice*

Italy: *Pasta*

Ireland: *Potatoes*

2 The Nutrients

aims

- To define a nutrient.
- To name/list the nutrients.
- To explain macronutrients and micronutrients.
- To list the nutrient sources, functions and deficiency diseases.
- To understand RDA. HL
- To list the effects of deficiency.

What is a nutrient?

A nutrient is a complex chemical substance found in food that is essential for the functioning of our bodies.

Name the nutrients

Six constituents are found in food, five of which are nutrients:

- Proteins • Fats • Carbohydrates • Vitamins • Minerals
- Water (this is a constituent, not a nutrient, but is essential for life).

Nutrients are divided into **two** groups: macronutrients and micronutrients.

Macronutrients	Micronutrients
Proteins, fats and carbohydrates – required by the body in large amounts	Minerals and vitamins – needed by the body in small amounts

exam Q

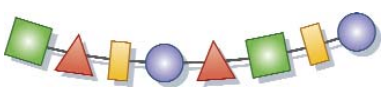
PAST EXAM QUESTION

Higher Level 2004, Section A, Q.2: Macronutrients and micronutrients – put into a table.

Protein

Composition

- The basic protein unit is an amino acid.
- Amino acids join to form chains of larger protein units.
- The elements in amino acids are carbon, hydrogen, oxygen and nitrogen.



Protein Chain

key point

Protein is the only nutrient that contains nitrogen. It is needed for growth.

key point

During digestion, the amino acids are separated so that they can be used for growth and repair.

Classification and sources

High biological value (HBV)	Low biological value (LBV)
• Mainly animal sources. • Meat, fish, eggs, milk, cheese, yoghurt, soya beans.	• Mainly vegetable/plant sources. • Pulses (peas, beans, lentils), nuts, cereals (oats, wheat).

Functions

- Produces heat and energy.
- Growth of body cells (skin, blood, tissues).
- Repair of damaged cells (a cut).
- Production of enzymes and hormones.

key point

LBV protein (vegetable sources) contains fibre and is low in fat.

Effects of deficiency

- Stunted growth.
- Imbalance in hormones and enzymes.
- Cells slow to repair.
- Fewer antibodies produced.

exam Q

PAST EXAM QUESTIONS

Higher Level 2008, Section A, Q.1: Sources of HBV protein.

Ordinary Level 2004, Section A, Q.1: Sources of proteins.

LINKS

- Food pyramid (meat, fish and alternatives) (p. 35)
- Digestion (p. 53)

RDA for protein

HL

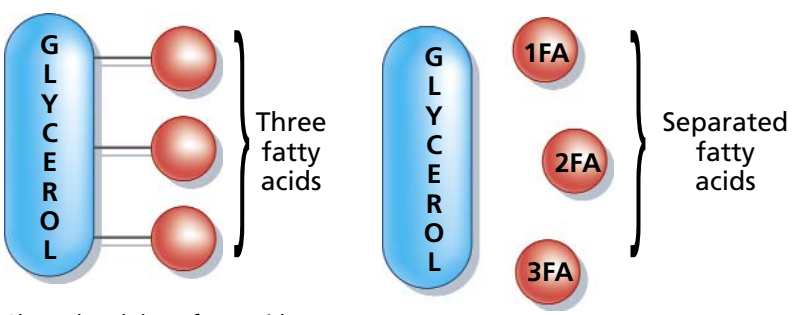
- 1 gram protein per 1 kilo of body weight.
- Children and teenagers need more because they are growing.

Fats/Oils

Fats contain twice as much energy as proteins or carbohydrates. Fats are a concentrated energy food. At room temperature, fats are solid and oils are liquid. Fats can be visible or invisible.

Composition

- Fats are made up of a glycerol attached to three fatty acids.
- These are arranged in an E-shaped structure.
- The elements in fats are carbon, hydrogen and oxygen.



Glycerol and three fatty acids

key point

During digestion, the links break in the E-shaped structure and the three fatty acids separate from glycerol.

Classification and sources of Fats/Oils (Lipids)

Classification	Sources
Saturated (mainly animal)	Unsaturated (mainly vegetable)
Milk, cream, cheese, butter, eggs, meat, lard, suet, meat products (sausages)	Nuts, whole cereals, oily fish, vegetable cooking oils, polyunsaturated margarine/spreads

Functions

- Produces heat and energy.
- Insulates the body with a layer of fat underneath the skin.
- Source of the fat-soluble vitamins A, D, E and K.
- Protects the kidneys, nerves and delicate organs.
- Gives a feeling of fullness and delays feeling hungry.

key point

- Excess fat is stored as adipose tissue.
- Saturated fats are high in cholesterol.

Effects of deficiency

Deficiency of fat is very rare.

- **Problems associated with high intake of fat:** Overweight, obesity.
- **Problems associated with high intake of saturated fat:** Heart disease and stroke.

Current dietary guidelines

- Eat less saturated fats and more vegetable fats.
- Do not exclude fats from the diet, as they contain fat-soluble vitamins.
- Low-fat foods are unsuitable for babies.

HL

RDA for fat

Deficiency in fat is unusual. It is recommended that daily fat intake be reduced to 30 per cent of the total energy in the diet (50 per cent saturated and 50 per cent unsaturated fats).

LINKS

- Coronary heart disease (p. 49)
- Obesity (p. 47)
- Special Diets (p. 49)
- Digestion (pp. 53-6)

exam Q

PAST EXAM QUESTIONS

- **Higher Level 2006, Section A, Q.3:** Reducing intake of fat in diet.
- **Ordinary Level 2008, Section A, Q.3 (a):** Function of fat in diet.
- **Ordinary Level 2006, Section A, Q.1:** Sources of fat in the diet.

Carbohydrates

Carbohydrates are one of our energy foods, and are the cheapest and most plentiful nutrient.

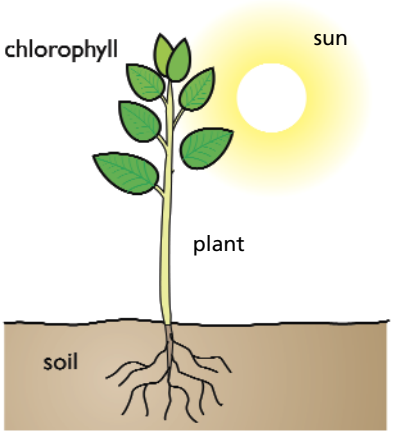
Photosynthesis is the process that produces carbohydrates. The action of sunlight on chlorophyll in the leaves creates energy.

Composition

- The most basic unit of carbohydrate is glucose, a simple sugar.
- The elements in carbohydrates are carbon, hydrogen and oxygen.

key point

During digestion, glucose units are separated and used for energy (p.53).



Photosynthesis

Classification and sources

Classes	Sources
Dietary fibre	Fruits, vegetables, whole cereals (skins and husks), wholemeal brown bread, brown rice, oatmeal
Starch	Potatoes, root and pulse vegetables, rice, pasta, cereals, flour, bread
Sugar	Soft drinks, sweets, biscuits, cakes, sugar, milk, fresh and dried fruit, honey, jam

Functions of carbohydrate (Sugars, starches and dietary fibre)

key point

Sugar supplies energy in the form of 'empty kilocalories'. Sugar is not essential in the diet.

- Provides heat and energy (starchy foods and sugars).
- Excess carbohydrate is converted into fat (adipose tissue).
- Dietary fibre helps the movement of food through the body.
- Fibre gives a feeling of fullness.

Effects of deficiency

Deficiency is rare.

LINKS

- Cereals (p. 82)
- Fruits (p. 90)
- Vegetables (p. 93)

Fibre

Dietary fibre (Roughage/Cellulose)

- Fibre-rich foods are plentiful and reasonably cheap.
- Fibre is found in the outer skins of fruits, vegetables and the husks of cereals.
- Processed, convenience and refined foods are low in fibre.
- Fibre helps to prevent constipation and other bowel diseases.
- Fibre absorbs water and makes us feel full.
- Fibre picks up chemicals and toxins (eliminated in the faeces).
- Fibre-rich foods provide vitamin B (which helps the release of energy in the body).