

**Health and Human Development
Teach Yourself Series**
Topic 3 of 19: Major nutrients important for health and
wellbeing (Unit 1)

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SAMPLE

The function and food sources of major nutrients important for health and wellbeing

As it appears in Unit 1

Nutrition is the science that explores the interaction between food and the body it is the process of nourishing the body and supplying the body with what is necessary to sustain life.

Many foods can act as risk or protective factors for health and wellbeing. A risk factor for food increases the likelihood of a person developing a particular disease or illness, such as Type 2 diabetes mellitus. A protective food factor does the opposite. It decreases the likelihood of a person developing a disease or illness.

Macro and Micro Nutrients

Macro nutrients are large; they are needed in large amounts for normal growth and development. The macro nutrients include carbohydrates, fat, protein and water. Macro nutrients are needed mostly for fuel and energy production. These include carbohydrates, protein and fats.

Micro Nutrients

Micro nutrients are found in small amounts in a variety of foods. They are required in small amounts for normal growth and development. The micro nutrients include all of the vitamins and minerals.

Summary of the function and food source of macro nutrients

<i>Nutrient</i>	Function	Food Source
Carbohydrates	<ul style="list-style-type: none"> • Preferred source of energy for activity; • Required for the functioning of the brain, nervous system and muscles; • Required in periods of growth. 	<ul style="list-style-type: none"> • Wholegrain bread; • Rice; • Pasta; • Fruit; • Vegetables; • Nuts.
Protein	<ul style="list-style-type: none"> • Growth, maintenance and repair of all body cells; • Production of enzymes, and hormones; • Emergency source of energy, if there is an insufficient supply of carbohydrates and fats. 	<ul style="list-style-type: none"> • Meat; • Meat products; • Soy bean; • Nuts; • Legumes.
Fats/Lipids	<ul style="list-style-type: none"> • Provides energy; • Provides insulation, the layer of fat below the skin prevents loss of heat from the body; • Protects bones and vital organs. 	<ul style="list-style-type: none"> • Saturated fat; • Animal products; • Dairy products. • Unsaturated fats; • Vegetable products such as canola oil and olive oil.
Water	<ul style="list-style-type: none"> • Carries nutrients to all cells; • Excretes wastes as urine; 	<ul style="list-style-type: none"> • Tap water; • Fruits;

	<ul style="list-style-type: none"> Regulate body temperature; Assists in the digestion and absorption of food and excretion of faeces; Lubricates joints and membranes. 	<ul style="list-style-type: none"> Vegetables; Some beverages e.g. cordial.
Dietary Fibre	<ul style="list-style-type: none"> Adds bulk to the bowel and therefore helps to prevent constipation; Provides bulk in the stomach to allow a feeling of fullness; Helps prevent some types of cancers including bowel cancer. 	<ul style="list-style-type: none"> Multigrain bread; Wholemeal pasta; Rice.

Summary Table: Fat Soluble Vitamins – Functions and food sources

VITAMIN	FUNCTIONS	FOOD SOURCES
Vitamin A	<ul style="list-style-type: none"> Night vision Healthy skin and the tissues lining the mouth, nose and lungs Resistance to infection 	<ul style="list-style-type: none"> Liver; Oily fish; Full cream milk; Dark green and orange fruits and vegetables.
Vitamin D	<ul style="list-style-type: none"> Absorption and metabolism of calcium and phosphorus to ensure bone and teeth formation and strength. 	<ul style="list-style-type: none"> Fatty fish; Dairy products; Sunlight.
Vitamin E	<ul style="list-style-type: none"> Acts as an anti-oxidant Maintains healthy cell membranes 	<ul style="list-style-type: none"> Nuts; Seeds; Eggs; Wholegrains; Fish; Fruits; Vegetables.
Vitamin K	<ul style="list-style-type: none"> Clotting of the blood 	<ul style="list-style-type: none"> Green leafy vegetables; Liver; Eggs; Cheese.

Summary of Water Soluble Vitamins – Function and food sources

VITAMIN	FUNCTIONS	FOOD SOURCES
B1 (B Group Vitamin)	<ul style="list-style-type: none"> Release of energy from food Metabolism of carbohydrates, 	<ul style="list-style-type: none"> Wholegrain breads; Cereals; Liver; Kidney; Vegemite.
B2 (B Group Vitamin)	<ul style="list-style-type: none"> Release of energy from food Metabolism of carbohydrates, protein and fat 	<ul style="list-style-type: none"> Wholegrain breads and cereals; Liver; Kidney; Vegemite.
B3	<ul style="list-style-type: none"> Release of energy from food 	<ul style="list-style-type: none"> Wholegrain breads and cereals;

(B Group Vitamin)	<ul style="list-style-type: none"> • Metabolism of carbohydrates, protein and fat • Healthy skin 	<ul style="list-style-type: none"> • Liver; • Kidney; • Vegemite
B6 (B Group Vitamin)	<ul style="list-style-type: none"> • Formation of red blood cells • Metabolism of protein 	<ul style="list-style-type: none"> • Legumes, • Meat; • Liver; • Poultry; • Fish.
Vitamin C	<ul style="list-style-type: none"> • Resistance to infection • Healing wounds • Healthy gums, teeth, bones • Assists in iron absorption 	<ul style="list-style-type: none"> • Citrus fruits; • Berries; • Capsicum.

Summary of Minerals – Functions and food sources

MINERALS	FUNCTIONS	FOOD SOURCES
Folate	<ul style="list-style-type: none"> • Formation of enzymes and red blood cells • Metabolism of DNA 	<ul style="list-style-type: none"> • Leafy green vegetables; • Chicken liver; • Wholegrain breads and cereals; • Nuts; • Yeast extracts – Vegemite
Calcium	<ul style="list-style-type: none"> • Structure of bones and teeth • Muscle contraction • Nerve functioning 	<ul style="list-style-type: none"> • Dairy Products; • Soy products; • Legumes; • Broccoli; • Canned fish.
Fluoride	<ul style="list-style-type: none"> • Maintenance of strong bones and teeth 	<ul style="list-style-type: none"> • Fluoridated drinking water.
Iodine	<ul style="list-style-type: none"> • Thyroid gland functioning 	<ul style="list-style-type: none"> • Seafood; • Seaweed; • Iodised table salt.
Iron	<ul style="list-style-type: none"> • Formation of red blood cells 	<ul style="list-style-type: none"> • Red meat; • Liver; • Kidney; • Egg yolk; • Wholegrain breads and cereals.
Phosphorus	<ul style="list-style-type: none"> • Interact with B group vitamins to release energy from food 	<ul style="list-style-type: none"> • Most animal and plant foods – meat, milk, cheese.
Sodium	<ul style="list-style-type: none"> • Assists in maintaining fluid balance in the body 	<ul style="list-style-type: none"> • Table salt added to foods; • Processed foods, • Bread; • Butter; • Chips.

Solutions to Review Questions:

1. Both macro and micro nutrients are required for normal growth and development.
2.
 - a. Food products that contain CHO and dietary fibre include: wholegrain bread, multigrain bread, wholemeal pasta and brown rice.
 - b. Dietary fibre adds bulk to the bowel and prevents constipation. It also adds bulk to the stomach creating a feeling of fullness.
3.
 - a.

Protein is used for growth, maintenance and repair of all body cells, the production of enzymes, and hormones. It is also an emergency source of energy, if there is an insufficient supply of carbohydrates and fats.

Fat provides energy, insulation; it forms a layer below the skin and prevents loss of heat from the body. Fat is also used to protect bones and vital organs.
 - b.

High blood cholesterol levels – CVD
 - c.

Unsaturated fat
4. Water has many functions these include:
 - Carrying nutrients to all cells;
 - Excrete wastes as urine;
 - Regulate body temperature;
 - Assists in the digestion and absorption of food and excretion of faeces;
 - Lubricates joints and membranes.

The best source of water is pure tap water.

5.

Nutrient	Function	Food Source
Carbohydrates	<ul style="list-style-type: none"> • Preferred source of energy for activity; • Required for the functioning of the brain, nervous system and muscles; • Required in periods of growth. 	<ul style="list-style-type: none"> • Wholegrain bread; • Rice; • Pasta; • Fruit; • Vegetables; • Nuts.
Dietary Fibre	<ul style="list-style-type: none"> • Adds bulk to the bowel and therefore helps to prevent constipation; • Provides bulk in the stomach to allow a feeling of fullness; • Helps prevent some types of cancers including bowel cancer. 	<ul style="list-style-type: none"> • Multigrain bread; • Wholemeal pasta; • Rice.
Protein	<ul style="list-style-type: none"> • Growth, maintenance and repair of all body cells; • Production of enzymes, and hormones; • Emergency source of energy, if there is an insufficient supply of carbohydrates and fats. 	<ul style="list-style-type: none"> • Meat; • Meat products; • Soy bean; • Nuts; • Legumes.
Fats/Lipids Saturated Unsaturated	<ul style="list-style-type: none"> • Provides energy; • Provides insulation, the layer of fat below the skin prevents loss of heat from the body; • Protects bones and vital organs. <ul style="list-style-type: none"> • These fats are found in meat and other animal products such as butter, cheese, and all milk except skim; • Saturated fats are also in palm and coconut oils, which are often used in commercial baked goods. For example donuts and party pies; • Eating too much saturated fat can raise blood cholesterol levels and increase the risk of heart disease; <ul style="list-style-type: none"> • These fats are found in plant foods and fish; • These may be good for heart health as they contribute to lowering blood cholesterol; • The best of the unsaturated fats are found in olive oil, peanut oil, canola oil, albacore tuna, and salmon; • The different types of unsaturated fats are: <ul style="list-style-type: none"> ○ Monounsaturated – found in olive oil, avocado and tuna; ○ Polyunsaturated – found in plant foods, including vegetable 	<ul style="list-style-type: none"> • Animal products; • Dairy products. <ul style="list-style-type: none"> • Vegetable products such as canola oil and olive oil.

Trans Fats	<ul style="list-style-type: none"> • Trans fats are found in processed foods such as snack foods, baked goods, and fried foods; • Like saturated fats, eating too much can raise cholesterol and increase the risk of heart disease. 	<ul style="list-style-type: none"> • Processed food items
Water	<ul style="list-style-type: none"> • Carries nutrients to all cells; • Excretes wastes as urine; • Regulate body temperature; • Assists in the digestion and absorption of food and excretion of faeces; • Lubricates joints and membranes. 	<ul style="list-style-type: none"> • Tap water; • Fruits; • Vegetables; • Some beverages e.g. cordial.

6.

Answer is B.

A means for transport fat-soluble vitamins

7.

Vitamin C is important to maintain a healthy body as it helps with resistance to infection, the healing of wounds, healthy gums, teeth, bones and assists in the absorption of iron.

8.

MINERALS	FUNCTIONS
Calcium	<ul style="list-style-type: none"> • Structure of bones and teeth • Muscle contraction • Nerve functioning
Sodium	<ul style="list-style-type: none"> • Assists in maintaining fluid balance in the body

9.

VITAMIN	FUNCTIONS	FOOD SOURCES
Vitamin D	<ul style="list-style-type: none"> • Absorption and metabolism of calcium and phosphorus to ensure bone and teeth formation and strength. 	<ul style="list-style-type: none"> • Fatty fish; • Dairy products; • Sunlight.

10.

a. Arthritis and musculoskeletal conditions - osteoporosis.

b. The minerals that interact to form bones are: calcium and fluoride.