

Food and diet – answers

1 The body uses food (i) for energy, (ii) for growth (making new cells), (iii) repairing or replacing tissues.

2 Fats and carbohydrates both provide the body with *energy* but fats can provide *twice* as much as carbohydrates. Excess fats can be stored in the body but carbohydrates must be changed into *glycogen* or *fat* before they can be stored. The main types of carbohydrates are *starch*, *sugar* and *cellulose*. Examples of food rich in starch are (e.g.) *potatoes* and *bread*. Foods rich in fats are (e.g.) *butter*, *cheese* or *fatty meat*.

3 Most carbohydrate is taken in as starch.

4 Proteins are made up of about 20 different *amino acids*. One example of a plant product rich in protein is *beans* (or *wheat* or *maize*). An animal product rich in protein is *meat* (or *eggs* or *cheese* or *fish*). When a protein is digested, it is broken down into its constituent *amino acids* and these are later built up in the body to make new *cytoplasm* (or *cells* or *tissues*). Excess proteins which are not used for making new cells or tissues are converted to *glycogen* which can be stored or used to provide *energy*.

5 Fish, meat and lettuce contain little or no carbohydrate.

6 (a) Carbohydrates contain the elements *carbon*, *hydrogen* and *oxygen*.

(b) Proteins contain these elements but also *nitrogen* and *sulphur*.

7 (a) (i) Bones need calcium, (ii) red blood cells need iron, (iii) the thyroid gland needs iodine.

(b) (i) Milk contains calcium, (ii) milk is deficient in iron.

8 Vegetable fibre retains water (keeping the faeces soft and bulky), prevents constipation, reduces the chance of disease of the large intestine (*any one*).

9 (a) Vitamin A (retinol) helps maintain resistance to infectious disease.

(b) Liver, cheese, butter, margarine, milk, eggs, green vegetables, carrots (*any two*) are a good source.

10 (a) Vitamin D (calciferol) is necessary for the healthy development of the skeleton.

(b) Butter, milk, cheese, egg-yolk, liver, oily fish (*any two*) are a good source.

11 In addition to sufficient energy, a balanced diet must contain proteins, carbohydrates and fats in the right proportion, and water, vitamins, mineral salts and fibre.

12 It should be possible to survive without carbohydrate as energy can be obtained from fats and proteins.

13 Western diets are often unhealthy because they contain too much *sugar* and *fat*, and not enough *fibre*.

14 The low temperature of refrigeration slows down bacterial reproduction and enzyme reactions.

15 Pasteurisation may involve heating milk to 72°C for 15 seconds, or 60°C for 30 minutes.

16 (a) Preservatives such as sodium nitrite (cured meat) or sulphur dioxide (fruit juice) may be needed to stop bacteria growing in food.

(b) Artificial colouring and flavouring are not necessary, nor are additives which simply cause the food to retain more water.

17 (a) Heating a food sample with Benedict's solution is a test for *sugar*. (Strictly, it is a test for a reducing sugar.)

(b) A test for starch is to add *iodine* solution to the food.

(c) In the biuret test for protein, *sodium hydroxide* and *copper sulphate* solutions are added to the sample. A *mauve* colour indicates the presence of protein.