

Core 1

(a) Much of the food we eat has to be digested.

(i) Explain why food needs to be digested.

.....
.....
.....[2]

(ii) Describe the part played by chewing in the process of digestion.

.....
.....
.....[2]

(b) (i) Describe how food is moved along the oesophagus by peristalsis.

.....
.....
.....[3]

(ii) Students sometimes wrongly suggest that food falls down into the stomach under the effect of gravity. Suggest **one** piece of evidence which would oppose this idea.

.....
.....[1]

Core 1

(c) Fig. 1 shows the human digestive system.

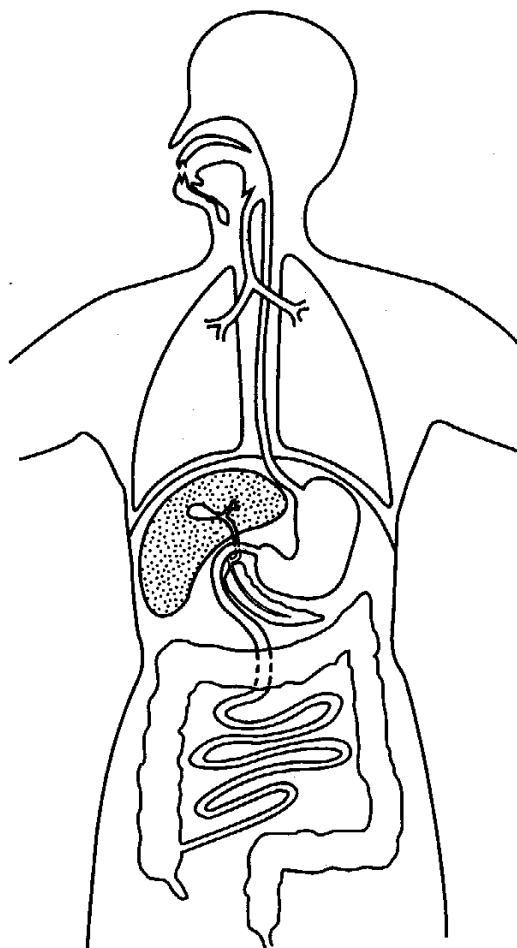


Fig. 1

- (i) Using the appropriate letter, label on Fig 1 where each of the following is produced:

an amylase, (A);

hydrochloric acid, (B);

a lipase, (C);

a protease, (D).

[4]

- (ii) State the nutrient on which protease enzymes act and name the products that are formed.

Nutrient

Products[2]

[Total : 14]

Core 2

Table 1 shows information about the composition of a fruit.

Table 1

nutritional component	amount in 100 g of fruit
energy	162 kJ
protein	0.6 g
sugars	8.7 g
fats	trace
fibre	1.6 g
minerals	trace
vitamins	trace

- (a) (i) The average daily amount of protein needed by humans is 66 g.
How many kilograms of this fruit would a person need to eat if this was the only source of protein? Show your working.

Answerkg [3]

- (ii) List the **four** main chemical elements from which protein is made.

1.

2.

3.

4.

[2]

- (b) (i) Describe how you could safely test this fruit to see if it contains reducing sugars.

.....

.....

.....[3]

- (ii) State what you would observe if a reducing sugar is present.

.....[1]

Core 2

(c) Fruit such as this is an important part of a healthy diet.

(i) Suggest **one** reason for eating food rich in fibre.

.....
.....[1]

(ii) Name the vitamin which is associated with citrus fruits and green vegetables. State the function of this vitamin in the body.

Vitamin

Function
.....[2]

[Total: 12]

Core 3

Fig. 2 shows part of the alimentary canal.

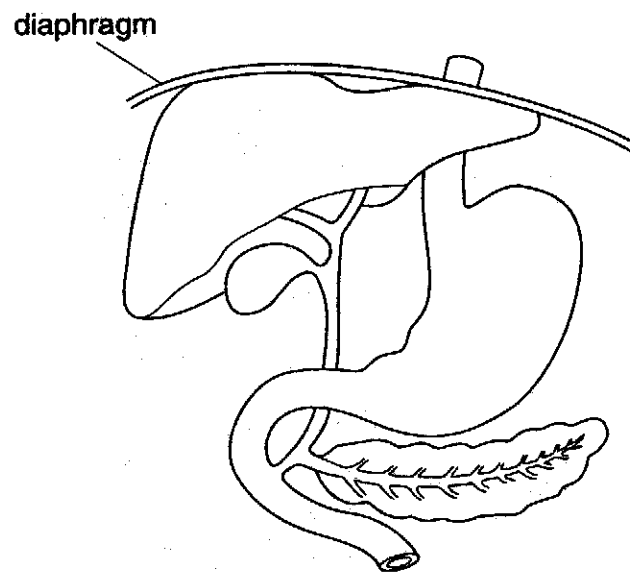


Fig. 2

(a) On Fig. 2 label each of the following structures:

- (i) stomach;
- (ii) liver;
- (iii) pancreas.

[3]

(b) Describe the parts played by the liver and the pancreas in the digestion of fats.

Liver

.....
.....

Pancreas

.....
.....

[4]

[Total:7]

Alternative to Practical 1

- (a) (i)** Describe how you would carry out a test to show the presence of fat in a biscuit. What observation would indicate the presence of fat?

Test

.....

Observation

.....[3]

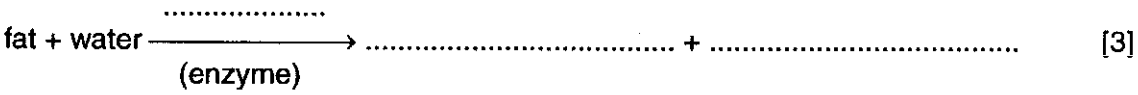
- (ii)** Describe how you would use this test to compare the fat content of two different types of biscuit.

.....

.....

.....[2]

- (b)** Complete the equation below to summarise the process of fat digestion.



[Total: 8]

Extension 1

Health workers in America were concerned about the diets of American people. In response a report was published called 'Dietary Goals'.

Fig. 3 compares an average 1977 diet with the report's recommended dietary goals.

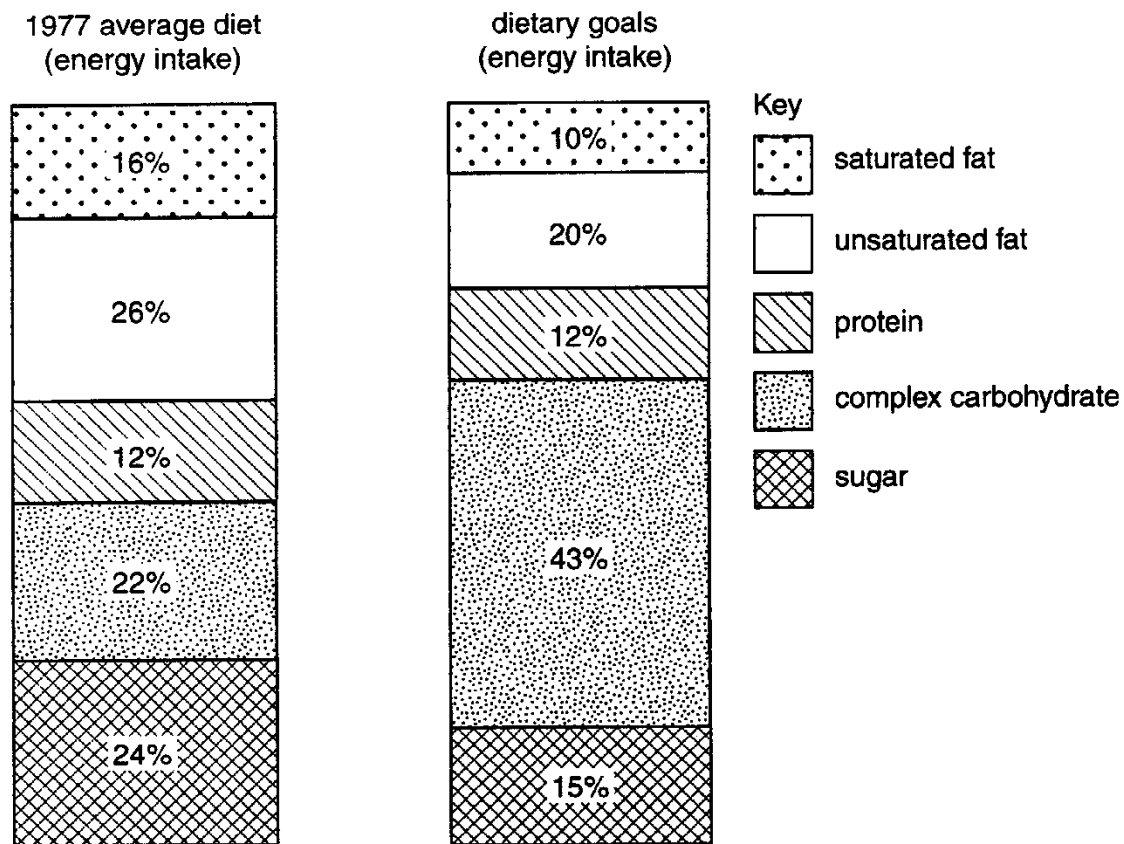


Fig. 3

(a) (i) What recommendations were made about changes to the fat content of the diet?

.....

.....

..... [2]

(ii) Suggest why these changes were recommended.

.....

.....

.....

..... [3]

Extension 1

(b) Complex carbohydrates are long chain molecules.

Name a long chain carbohydrate present in

(i) plant tissue;

(ii) animal tissue. [2]

(c) Suggest why a reduction in the sugar content of the diet was recommended.

.....
.....
..... [2]

It was also recommended that people should reduce their salt intake to about 3 g a day.

(d) Suggest why a high salt intake can be dangerous to health.

.....
..... [1]

Babies need a carefully controlled diet to keep them healthy. Mothers are often advised to feed their babies with breast milk rather than with milk derived from cows (formula milk).

(e) State **three** advantages of feeding a baby with breast milk compared with formula milk.

1.
2.
3. [3]

[Total: 13]

Extension 2

- (a) Describe the processes, beginning with nutrition, which result in the formation of proteins in the leaves of a photosynthetic plant. [8]
- (b) (i) Explain how amino acids in the small intestine of a mammal are assimilated into muscle tissue. [3]
- (ii) Outline the role of proteins in animals. [4]

[Total: 15]

Core 1

- a(i) to change food into simple / small / soluble form / molecules
for absorption / diffusion(into intestine wall / villi) / carriage in blood
- (ii) any two of these
 - make small enough to swallow
 - increase surface area of particles
 - mix with saliva / enzyme / amylase
- b(i) any three of these
 - contraction of (circular) muscles behind food / bolus
 - relaxation of muscles in front
 - occurs rhythmically / in waves
 - food forced forward / along tube
- (ii) any one of these
 - can swallow standing on head / hanging upside down
 - can swallow in space with no gravity
 - some mammals (standing on four legs) have horizontal oesophagus
 - some mammals can regurgitate food against gravity
- c(i) A – label to salivary gland / mouth / pancreas
B – label to stomach
C – label to pancreas
D – label to stomach / pancreas / small intestine
- (ii) protein / named protein
amino acids / polypeptides / peptides

Core 2

- a(i) $66 / 0.6 = 110$
 $110 \times 100 \text{ g fruit} = 11 \text{ (kg)}$
- (ii) carbon, hydrogen, oxygen, nitrogen
- b(i) add to Benedict's solution / Fehling's reagent
heat
use of water bath / goggles / any other relevant safety practice
- (ii) colour change to orange (accept yellow / brick red/ red-brown)
- c(i) any one of these
aids peristalsis / movement of food along gut(or alternative wording)
prevents constipation(or alternative wording)
reduces fat absorption / risk of bowel cancer(or alternative wording)
- (ii) any one of these
vitamin C
maintains healthy skin
wounds heal more rapidly
prevents scurvy
assists uptake of iron

Core 3

- a labels correctly placed
- b any four of these
 - liver production of bile / bile salts
emulsifies fats / increases surface area (alternative wording)
neutralises stomach acid / raises pH
 - pancreas
secretes lipase / enzyme
digests / breaks down fats
to fatty acids and glycerol

Alternative to Practical 1

- a(i) emulsion test – add ethanol / alcohol
pour into water
observation - cloudiness / white / milky / emulsion
- (ii) equal quantities of biscuit / same conditions
one comparison described e.g. of cloudiness
- b lipase / esterase
fatty acids and glycerol

Extension 1

- a(i) one mark for reduction / one mark for stating figures from
reduce fat / saturated fat / unsaturated fat
reduce fat content from 42% to 30% or by a quarter (or alternative wording)
reduce saturated fat from 16% to 10 % or by a third or by 6%(or alternative wording)
reduce unsaturated fat from 26% to 20% or by a fifth or by 6%(or alternative wording)
- (ii) any one from
reference to problems of obesity (resulting from too much fat in the diet)
reference to presence of cholesterol
in (some) saturated fats
can cause atherosclerosis / atheroma / blockage of arteries
reference to heart problems(or alternative wording)
reference to arthritis problems
- b(i) starch / cellulose / hemicellulose / amylose / amylopectin / pectin / callose / insulin
Reject glycogen
glycogen / chitin
Reject glucagon
- c(i) reference to dental decay(or alternative wording)
reference to problems with obesity(or alternative wording)
leading to heart disease / diabetes
- d reference to high blood pressure / greater risk of heart attack (or alternative wording)
- e any three of these
breast milk contains antibodies or greater protection from infection
breast milk contains foodstuffs in correct proportions (or alternative wording)
bottle milk may contain bacteria or cause intestine disease (accept breast milk is sterile)
financial implications of bottle milk
some babies are allergic to cow's milk
reference to correct temperature of breast milk
reference to convenience of breast milk or preparation involved with bottle milk
no additives / preservatives in breast milk
reference to bonding through breast feeding
reference to triggering reduction in size of uterus

Extension 2

- a(i) any eight of these
- reference to absorption of nitrogen-containing salts by roots (accept reference to ions)
 - by diffusion / active transport
 - reference to nitrogen-fixing bacteria in root nodules
 - nitrogen salts transported in xylem
 - reference to photosynthesis
 - carbon dioxide is combined with / reacts with water
 - using energy from (sun)light
 - reference to chloroplasts / chlorophyll
 - sugars produced
 - nitrogen is combined with sugars to make amino acids / proteins
- b(i) amino acids pass through ileum wall / epithelium or lining or wall of villus
absorbed into blood (stream)
transported to muscles in plasma
amino acids synthesized into proteins (or alternative wording)
- (ii) any four of these
- reference to growth / repair / formation of new cells
 - reference to hormones
 - reference to enzymes
 - constituent of cell membranes(or alternative wording)
 - reference to haemoglobin
 - reference to collagen
 - reference to keratin
 - reference to antibodies
 - reference to fibrinogen / fibrin