Humans as organisms

Chapter 4 Food and digestion

It is very important that you are able to answer the questions on your own, using your own knowledge of Biology. Have a go at the questions first, and then check your answers using this page. If you get a question wrong, try to work out where you have made an error.

1 a) Carbohydrates
   b) Sugars/glucose
   c) Proteins, amino acids
   d) Vitamin C
   e) Fibre/roughage
   f) Store

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<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Rich source</th>
<th>Deficiency disease</th>
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<tbody>
<tr>
<td>vitamin C</td>
<td>liver, meat, cocoa</td>
<td>anaemia</td>
</tr>
<tr>
<td>iodine</td>
<td>fish, iodised salt tablets</td>
<td>beri-beri</td>
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<tr>
<td></td>
<td>milk, green vegetables</td>
<td>soft bones</td>
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<tr>
<td>vitamin A</td>
<td>carrots, milk, butter, liver</td>
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3 a) i) Butter
   ii) Milk
b) A is protein since beef and tuna have a high percentage of it. B is water since a high percentage is present in most of the foods, e.g. 89% in milk, but there is relatively little in butter. C is carbohydrate since it is present in milk and potatoes but absent in the other foods. D is fat since it has a particularly high percentage in butter.

c) Two of: vitamins; minerals; fibre or roughage

4 a) i) Chicken
   ii) Chicken
   Protein is needed for growth and making new cells, carbohydrates needed for energy.
b) Milk, sausage, chicken. You need fibre to add bulk to your food so that it passes down the gut. It prevents constipation, absorbs poisonous wastes from digestive foods, and is thought by many to lower the level of cholesterol.
c) i) Sausage
   ii) Watercress
d) Watercress. Iron is needed to make haemoglobin for the red blood cells and so prevent anaemia.
e) Sausage and chicken. To prevent scurvy and needed for tissue repair and resistance to disease.
f) i) 136 kJ
   ii) 3040 kJ
5  a) BMI = \frac{85}{3.24} = 26.23

b) Cut down on fatty and sugary foods, take exercise. At a BMI of 26.23 he is overweight. This can have an effect on his general health and possibly lead to heart disease, high blood pressure, diabetes and arthritis.

c) If energy intake is greater than energy output, then a person will put on weight by increasing their body fat.

d) i) Basal metabolic rate (BMR) is the rate at which chemical reactions take place in our bodies (our metabolism).

ii) A person with an increased BMR will 'burn up' nutrients more quickly so there will be less chance of putting on weight with its associated health problems.

6  a) A = oesophagus, B = stomach, C = pancreas, D = colon, E = rectum, F = anus, G = liver, H = gall bladder, I = small intestine, J = appendix

b)  i) D
 ii) B
 iii) E
 iv) G
 v) H
 vi) A
 vii) I
 viii) J
 ix) F
 x) C

7  a) 4)
 b) 6)
 c) 5)
 d) 2)
 e) 3)
 f) 1)