BEFORE READING

a What are the essential nutrients needed for a healthy diet?

b Use the words in the box to complete the introductory passage about fats.

<table>
<thead>
<tr>
<th>energy</th>
<th>esters</th>
<th>fatty acids (2)</th>
<th>glycerol (2)</th>
<th>hydrogenation</th>
<th>hydrophobic</th>
</tr>
</thead>
<tbody>
<tr>
<td>lipids</td>
<td>organic solvents</td>
<td>plants and animals</td>
<td>triglycerides</td>
<td>unsaturated</td>
<td>saturated</td>
</tr>
<tr>
<td>water</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Fats
Fats and oils are naturally occurring ................. used as ................. storage compounds by ................. . They are members of a larger class of naturally occurring compounds called ................., which are organic molecules insoluble in ................. but soluble in ................., in fact fats are ................., or “water fearing”.
Fats and oils are ................., they are a combination of three ................. with one molecule of ................. . ................. are long-chain carboxylic acids, their structure strongly resembles that of other simpler hydrocarbons, in fact fats are animal gasoline. ................. acts as the frame to which the three fatty acids can attach themselves.
Both vegetable oil advertisements and nutritionists have frequently asserted the benefits of using ................. fats, which have one or more double bonds along the carbon backbone, rather than ................. fats, which have no double bonds between carbon atoms. Fat molecules with more than one double bonds are called ................. . ................. is the process by which oils are artificially saturated and converted to solid fats.

WHILE READING

Read the text and find words that match these definitions:
1. animal part used as food (e.g. liver, kidney, brain, etc.) - .......... .......... 
2. yellow part of an egg - .......... .......... 
3. arteries, veins and capillaries - .......... .......... .......... 
4. chief support, spinal column - .......... .......... 
5. amount of nutrients from food - .......... .......... .......... 
6. minerals in the liquid produced by the liver to help the body to digest fats - .......... .......... .......... 
7. colourless fluid containing white blood cells - ..........
Fats as elements of nutrition

Like carbohydrates, fats are used in the body primarily as an energy source, and have several other minor though important functions. Fats store about twice as much energy in a given weight as carbohydrates do, because many fewer of its chemical bonds have been oxidized. Fats are a universally popular element of food, probably on account of their various flavors, smooth texture, and the sensation of “fullness” they produce when eaten. Although some is dispersed invisibly among the body tissues, most of the fat we store as an energy reserve is concentrated in obvious adipose tissue made up of cells specialized for that function. Our glycogen reserves may be strictly limited, but there is no limit to the fat we can accommodate.

Unlike sugars, fats are not soluble in water, the body’s chemical medium, and so must receive special treatment during digestion. They are emulsified, or broken down into small droplets, to increase the number of molecules exposed to the digestive enzymes in the small intestine, and in order to be distributed to the rest of body, the resulting mixture of fatty acids, mono-, di-, and some triglycerides is coated with a phospholipid-protein envelope in the intestinal wall and released to the lymph fluid, where it complexes with blood proteins for the final journey to the liver or to adipose tissue. These lipid-protein complexes are called lipoproteins, and come in a couple of varieties, the high density and low density, or HDLs and LDLs. Recent research suggests that the relative levels of these substances may have something to do with the risk of heart disease; HDLs, which carry cholesterol to the liver, seem to be associated with lower risk.
Essential Fatty Acids
Fats do much more for us than store energy. Certain fatty acids are converted by the body into phospholipids, those molecules with both fat-soluble and water-soluble ends that are the basic material of cell membranes. The brain, nervous system, and liver are especially rich in phospholipids. A few of the fatty acids that go into these materials are, like some vitamins and amino acids, absolutely essential to the diet; the human body cannot synthesize them from related materials.

Cholesterol
Many of us probably associate the word polyunsaturated with advertisements for vegetable oil, and with the phrase “no cholesterol.” Fat unsaturation – the presence of double bonds along the carbon backbones of its constituent fatty acids – became a commercial issue only when studies linked saturated fats with the development of heart disease. This is also the reason for the general notoriety of cholesterol, which is not a fat, but a different member of the chemical family called the lipids. It is a uniquely animal product; organ meats and egg yolk are especially rich sources. It is well known that excess cholesterol can be deposited on the walls of our blood vessels and so lead to circulatory problems. It is less well known that cholesterol is a very important molecule, and that the body synthesizes significant quantities of it. Cholesterol forms the nucleus of the vitamin D molecule, of various regulatory and sex hormones, and of the bile salts that emulsify fats in the intestine; it also contributes to the fluidity of our cell membranes. Most cholesterol synthesis goes on in the liver and intestine, but all cells can apparently supply their own immediate needs. The problem is that synthesis in the body proceeds independently of dietary intake (although it appears to be raised by the ingestion of saturated fats), and usually exceeds that intake. In addition, we have few mechanisms for getting rid of cholesterol. We cannot break the molecule down into its component atoms, and very little is excreted; in fact, bile salts are reabsorbed in the small intestine. There is also evidence that both physical inactivity and emotional stress can increase blood cholesterol levels. Because the situation is so complicated, there is still some debate as to whether reducing cholesterol in the diet by avoiding rich, fatty foods is an effective way to control its concentration in our bodies.

From: Mc Gee, On Food and Cooking, Unwin Hyman.

AFTER READING

LANGUAGE

Vocabulary

Match the adjectives in the box to make pairs of synonyms.

adipose coated covered dispersed essential even fatty favourite
important necessary obvious popular scattered several significant
smooth various visible
b Match the adjectives in the box into pairs of antonyms.

<table>
<thead>
<tr>
<th>adjective</th>
<th>antonym</th>
</tr>
</thead>
<tbody>
<tr>
<td>absolute</td>
<td>concentrated</td>
</tr>
<tr>
<td>major</td>
<td>minor</td>
</tr>
<tr>
<td>smooth</td>
<td>superfluous</td>
</tr>
</tbody>
</table>

Match the words and the definitions.

1. blood circulation □ brain and all the nerves in the body
2. digestive system □ cells and molecules in the body which fight infection and disease
3. gland □ chemical produced in the body that controls growth and development
4. hormone □ movement of the blood around the body
5. immune system □ organ that makes chemical substances or that allows substances to be passed out of the body
6. nervous system □ parts of the body (stomach, liver, kidneys) which work to digest food
7. reproductive system □ parts of the body used for producing babies
8. respiratory system □ parts of the body used for breathing

d Do you know what these acronyms and abbreviations which are found in blood tests stand for?

WBC - ........................................ Bazo - ............................
RBC - ........................................ Hb - ............................
LY - ........................................ LH - ............................
MO (NO) - .................................... TSH - ............................
HDL - ........................................ FSH - ............................
LDL - ........................................ MCV - ............................
NEUT - ....................................... MCH - ............................
EO - ......................................... MCHC - ............................

An International Olympic Committee conference poster.