Choose all of the correct answers, and be prepared to explain your choice :

1. Carbohydrates are …

a) stored first, used later
b) used first, stored later
c) the main source of energy in most diets
d) the most energy-dense nutrient
e) absorbed in the stomach

2. Carbohydrates are absorbed in the form of …

a) glucose
b) insulin
c) simple sugars
d) glycerol
e) glycogen

3. Glycogen is released …

a) from liver cells
b) from muscle cells
c) from adipose cells
d) in response to insulin
e) in response to glucagon

4. Fats are …

a) stored first, used later
b) used first, stored later
c) the main source of energy in healthy diets
d) the most energy-dense nutrient
e) healthier when they are saturated

5. Fats are absorbed in the form of …

a) triglycerides
b) chylomicrons
c) fatty acids
d) ketone bodies
e) glycerol

6. Incomplete proteins …

a) do not contain any essential amino acids
b) contain some essential amino acids
c) do not contain all 12 essential amino acids
d) are found in cereal grains
e) are obtained mainly from dairy products

7. Most nutrients are broken down …

a) in the stomach
b) in the small intestine
c) in the large intestine
d) by capillaries and lacteals in the villi
e) by enzymes

8. Nutrients are absorbed …

a) in the stomach
b) in the small intestine
c) in the large intestine
d) into the bloodstream through capillaries
e) into the lymph through lacteals

9. Obesity is most commonly caused by …

a) insulin deficiency
b) leptin deficiency
c) sedentary lifestyle
d) energy-dense diet
e) dyslipidemia

10. Examples of dyslipidemia include …

a) total cholesterol < 200 mg/dL
b) total cholesterol > 200 mg/dL
c) LDL cholesterol < 100 mg/dL
d) HDL cholesterol > 50 mg/dL
e) triglycerides > 150 mg/dL

11. Metabolic syndrome (MetS) is a combination of …

a) obesity
b) hypertension
c) dyslipidemia
d) insulin deficiency
e) insulin resistance

12. Recommendations for overweight and obese patients generally include …

a) using a bathroom scale every day
b) fasting
c) drinking more liquids
d) walking instead of driving
e) eating more fruits and vegetables

Nutrients in the Diet[1] : Carbohydrates

VOCABULARY[2] *in context*. Match the following definitions with words from the reading passage below, then give an appropriate translation in French.

1. Something consumed to produce energy, especially a material such as wood, coal, gas, or oil; Nutritive material metabolized by a living organism : _____
2. *The entire material or physical structure of an organism; The physical part of a person :* _____
3. *A group of organic compounds that includes sugars, starches, celluloses, and gums and serves as a major energy source in the diet. These compounds contain only carbon, hydrogen, and oxygen, usually in the ratio 1 :2 :1 :* _____
4. *A class of neutral lipids consisting of various triglycerides; Mixtures of solid or semisolid triglycerides. Numerous compounds of carbon, hydrogen, and oxygen that are glycerides of fatty acids, […] are a major class of energy-rich food, and are soluble in organic solvents (as ether) but not in water. :* _____
5. *A group of complex organic macromolecules that contain carbon, hydrogen, oxygen, nitrogen, and usually sulfur and are composed of one or more chains of amino acids. They are fundamental components of all living cells and include many substances, such*

[1] Adapted from : *English in Basic Medical Science, Oxford University Press*
[2] Les définitions du vocabulaire à réviser sont données en *italique* et numérotées en ***gras***.

as enzymes, hormones, and antibodies, that are necessary for the proper functioning of an organism. They are essential for the growth and repair of tissue and can be obtained from foods such as meat, fish, eggs, milk, and legumes : _____

6. *1. The usual food and drink of a person. 2. A regulated selection of foods, as for medical reasons or cosmetic weight loss. :* _____

7. For the most part; chiefly. Principally. : _____
8. A plant cultivated for an edible (nutritious) part : _____
9. Substances (such as) fats that are generally slippery, combustible, viscous, liquid or liquefiable at room temperatures, soluble in various organic solvents such as ether but not in water : _____
10. The edible flesh (tissue) of animals : _____
11. Cold-blooded aquatic vertebrates of the superclass Pisces : _____
12. Relating to milk : _____

13. *To take in; assimilate (especially a liquid) :* _____

14. *The flow (circulation) of blood through the circulatory system :* _____

15. *A monosaccharide sugar, $C_6H_{12}O_6$. It is the principal circulating sugar in the blood and the major energy source of the body :* _____

16. *The process of using or being used :* _____

17. *To change (something) into another form, substance, state, etc.; transform :* _____

18. *A polysaccharide, $(C_6H_{10}O_5)_n$, that is the main form of carbohydrate storage and occurs primarily in the liver and muscle tissue. It is readily converted to glucose as needed by the body to satisfy its energy needs :* _____

19. *To reserve; stock; To deposit :* _____

20. *A large, reddish-brown, glandular organ located in the upper right portion of the abdominal cavity that secretes bile and is active in the formation of certain blood proteins and in the metabolism of carbohydrates, fats, and proteins :* _____

21. 1. To deal with ; 2. To satisfy (a need, for example) ; fulfill : _____

22. *The food served and eaten at one time :* _____

23. *1. To move from a lower to a higher position; 2. To increase in size, volume, or level :* _____

24. *To produce and discharge a substance, especially from the cells of specialized glands. :* _____

25. *A polypeptide hormone that is secreted by the islets of Langerhans, helps regulate the metabolism of carbohydrates and fats, especially the conversion of glucose to glycogen, and promotes protein synthesis and the formation and storage of neutral lipids. :* _____

26. *Proteins functioning as biochemical catalysts :* _____

27. 1. During the time that. 2 On the condition that : _____
28. To continue in the same state or condition : _____
29. Existing in great quantity or ample supply. Syn. abundant : _____

30. *1. To drop or come down freely under the influence of gravity. 2. To lessen (diminish) in amount or degree :* _____

31. *The formation of a chemical compound through the combination of simpler compounds or elements. :* _____

32. *To decompose chemically :* _____

33. *A polypeptide hormone secreted by alpha cells in the pancreas that initiates a rise in blood sugar levels by stimulating the breakdown of glycogen by the liver. :* _____

34. *To create. To cause to exist. :* _____

35. Relating to particular aspects, features, or details : _____
36. A signal to answer or correspond to another : _____

37. *1. Sugar in the form of glucose in the blood. 2. The concentration of glucose in the blood, measured in milligrams of glucose per 100 milliliters of blood. :* _____

38. *Becoming greater or larger :* _____

39. *Quantity :* _____

40. *To eject or expel (a substance), cf. secrete:* _____

41. *To be without or in need of :* _____

42. To assign for a specific end, use, or purpose : _____
43. To use jointly or in common : _____
44. Different from : _____

The fuels of the body are carbohydrates, fats and proteins. These* are taken in the diet. They* are found mainly in cereal grains, vegetable oils, meat, fish and dairy products.

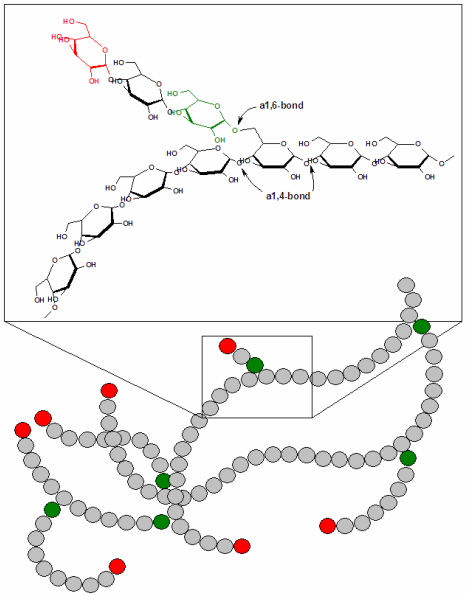
Average caloric[3] values for 1g :

Carbohydrates	4 Cal
Fats	9 Cal
Proteins	4 Cal

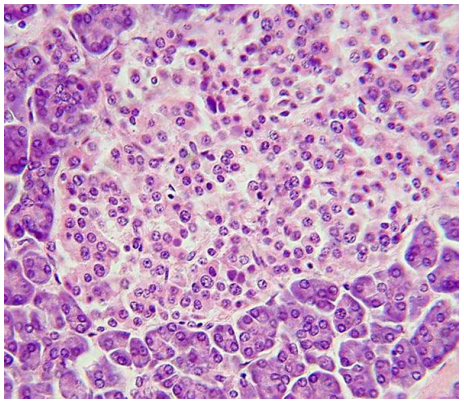
Carbohydrates

Carbohydrates are the principal source of energy in most diets. They* are absorbed into the bloodstream primarily in the form of glucose. Glucose not needed for immediate use is converted into glycogen and stored in the liver.

[3] NB. *The "calorie" we refer to in food is actually a kilocalorie (abbr. kcal). 1 kilocalorie is the same as 1 Calorie (upper case C). A kilocalorie is the amount of heat required to raise the temperature of 1 kilogram of water one degree Celsius.*



1.

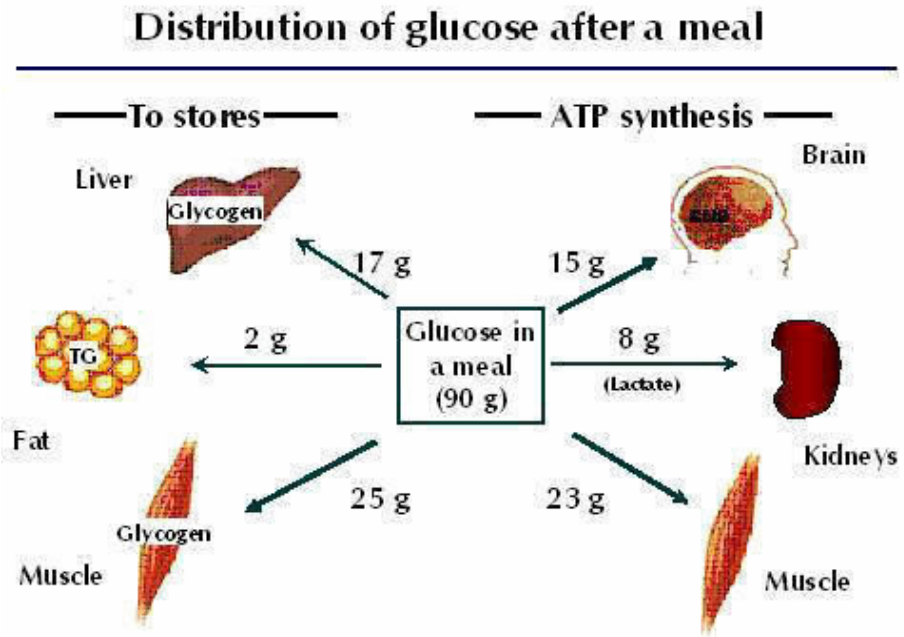


2.

1. The structure of glycogen *consists of long polymer chains of glucose units* **2. Islets of Langerhans** *The endocrine (i.e. hormone-producing) cells of the pancreas are grouped in the islets of Langerhans. Alpha cells (15-20%) produce glucagon, whereas Beta cells (65-80%) produce insulin.*

Glycogen forms an energy reserve that can be quickly mobilized to meet a sudden need for glucose. As a meal containing carbohydrates is eaten and digested, blood glucose levels rise, and the pancreas secretes insulin. Insulin acts on the hepatocytes (liver cells) to stimulate the action of several enzymes, including glycogen synthase which converts glucose molecules one by one into glycogen. Glucose molecules are added to the chains of glycogen as long as both insulin and glucose remain plentiful. After a meal has been digested and glucose levels begin to fall, insulin secretion is reduced, and glycogen synthesis stops. Several hours after a meal, glycogen begins to be broken down to be converted again to glucose. Glucagon is another hormone produced by the pancreas, which* in many respects serves as a counter-signal to insulin. When the blood sugar begins to fall below normal (hypoglycemia), glucagon is secreted in increasing amounts, causing the liver to convert stored glycogen into glucose and release it* into the bloodstream.

Muscle cells lack the ability to pass glucose into the blood, so the glycogen they* store internally is destined for internal use and is* not shared with other cells, unlike* liver cells.[4]



Distribution of Glucose After a Meal[5]

An average meal contains about 90 grams of glucose. This glucose will either be utilized as an immediate energy substrate for ATP synthesis or will be stored as glycogen or fat.

Around 15-18% of the ingested glucose goes to nourish the brain during the absorptive period. Note that there is no storage form of glucose in the CNS; all of the glucose that is taken up is "burned". The brain is, therefore, extremely sensitive to reduced blood glucose levels.

The liver stores excess glucose as glycogen, readying a buffer for blood glucose during the coming post-absorptive period. Little glucose is normally converted to fat, although overeating carbohydrates (sucrose and fructose) can lead to fat production and storage.

Skeletal muscles dominate, accounting for about 50% of the total glucose uptake. Approximately half of this is stored as glycogen, the rest is used as an immediate energy substrate.

[4] http://en.wikipedia.org/wiki/Glycogen
[5] http ://www.medbio.info

***What do the following words refer to ?**

a. *"These* are taken in the diet. They* are found mainly in cereal grains, … and dairy products."* → "These" and "they" refer to …
b. *"They* are absorbed into the bloodstream in the form of glucose"* → "They" refers to …
c. *"which* in many respects serves as a counter-signal to insulin"* → "Which" refers to…
d. *"and release it* into the bloodstream"* → "It" refers to…
e. *"the glycogen they* store internally is destined for internal use"* → "They" refers to…
f. *"and is* not shared with other cells"* → The subject of "is not shared" is…
g. *"unlike* liver cells"* → Liver cells are different from… insofar as[6]…

True or False ? (Be ready to explain and discuss).

i. Glycogen stored in the liver and muscles can be released when the blood sugar concentration goes down.
ii. Insulin converts glucose into glycogen, whereas glucagon converts glycogen into glucose.
iii. Most of the glucose absorbed after a meal is taken up by the muscles.

Questions : (1) Ask questions about the following points, then (2) let someone else answer in a complete sentence (3) using as many of the suggested terms as possible.

WHAT SORTS – HOW (×2) – WHAT

1. **Typical *composition of* the diet.** → …

cereal – fruits and – and – products

A typical diet …

2. ***The absorption & metabolism of* carbohydrates.** → …

converted – and – bloodstream – either – immediately – or else – liver an – in the form

Carbohydrates …

3. ***"Glycogen". The mechanism by which* blood sugar levels are regulated.** → …

form in which – stored – produced – and in – in response to – when – levels – When – low – pancreas – break down – in order to prevent

Glycogen is…

4. **Make up one original question of your own relating to this section of the article, and write a 2-3 line answer to it using information either from the article or from outside sources.**

[6] NB. insofar as = to the extent that… / *dans la mesure où*

Nutrients in the diet : Fats

VOCABULARY *in context*. Match the following definitions with words from the reading passage below, then give an appropriate translation in French.

45. *A type of connective tissue that contains stored cellular fat :* _____

46. *Of or relating to the diet :* _____

47. *A naturally occurring ester of three fatty acids and glycerol that is the chief constituent of fats and oils. :* _____

48. To make into an assembled unit : _____

49. *One of the microscopic particles of fat occurring in chyle and in the blood, especially after a meal high in fat. :* _____

50. *The interconnected system of spaces and vessels between body tissues and organs by which lymph circulates throughout the body. :* _____

51. *After a long time, finally, in the end :* _____

52. One or the other : _____

53. In a prompt, timely manner; promptly. Without difficulty : _____

54. *Present and ready for use ; accessible :* _____

55. *More than is usual, more than necessary :* _____

56. *To receive into the body; incorporate :* _____

57. Containing nothing; unoccupied : _____

58. *Abstinence from food and drink. A period of such abstention :* _____

59. *A syrupy, sweet, colorless or yellowish liquid, $C_3H_8O_3$, obtained from fats and oils and used as a solvent, an antifreeze, a plasticizer, and a sweetener :* _____

60. *A large group of monobasic acids, especially those found in animal and vegetable fats and oils, having the general formula $C_nH_{2n+1}COOH$:* _____

61. *A class of simple, water-soluble proteins that can be coagulated by heat and are found in egg white, blood serum, milk, and many other animal and plant tissues. :* _____

62. *To be the source of. To produce; specif., a) to give or furnish as a natural process or as the result of cultivation b) to give in return; produce as a result :* _____

63. *Short for adenosine triphosphate. An organic compound, C10H16N5O13P3, that is composed of adenosine and three phosphate groups. It serves as a source of energy for many metabolic processes. :* _____

64. *The muscle of the heart, consisting of anastomosing transversely striated muscle fibers formed of cells united at intercalated disks; the myocardium. :* _____

65. *A muscle that is connected at either or both extremities with a bone and consists of elongated, multinucleated, transversely striated, skeletal muscle fibers, together with connective tissues, blood vessels, and nerves. :* _____

66. *The portion of the central nervous system that is enclosed within the cranium, continuous with the spinal cord, and composed of gray matter and white matter. It is the primary center for the regulation and control of bodily activities, receiving and interpreting sensory impulses, and transmitting information to the muscles and body organs. It is also the seat of consciousness, thought, memory, and emotion. Also called encephalon. :* _____

67. To be dependent on, as for support or maintenance : _____

68. *An intermediate product of the metabolism of fatty acids. They tend to accumulate in the blood and urine of individuals affected by starvation or uncontrolled diabetes mellitus. :* _____

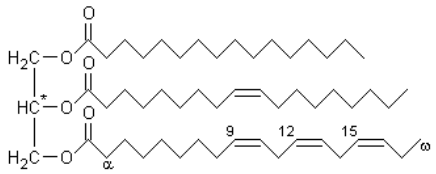
69. *A state of extreme hunger resulting from lack of essential nutrients over a prolonged period :* _____

70. *1. The process of taking food into the body. 2. The substances, or the quantities thereof, taken in and utilized by the body. :* _____

Fats make up the second largest source of energy in most diets. They* are stored in adipose tissue and round the principal internal organs. Dietary fat is digested and then re-synthesized into triglycerides[7] and packaged into lipoprotein particles known as chylomicrons, which circulate first through the lymphatic system before entering the bloodstream. Eventually, they* bind to the membranes of adipose cells or muscle, where they* are either stored or oxidized for energy.[8]

Whereas carbohydrates provide a readily available source of energy, lipids function primarily as an energy reserve[9], as converting fat to energy is a slower* process[10]. If excess carbohydrate is taken in, this* can be also converted into fat and stored. The stored fat is utilized when the liver is empty of glycogen (e.g. during physical exercise, or after a period of fasting).

When required*, the stored triglycerides are released from the adipose tissue, a process* which is stimulated by adrenaline and glucagon, the same hormones which stimulate release of stored glycogen as glucose. Fats are broken down in the body to release glycerol and free fatty acids. The glycerol can be converted to glucose by the liver and thus used as a source of energy.[11] When released* from the adipose tissue, the fatty acids are transported attached to the major protein in the circulation, which is albumin.[12] Free fatty acids are an important source of fuel



Example of an unsaturated fat triglyceride. *Left part : glycerol, right part from top to bottom : palmitic acid, oleic acid, alpha-linolenic acid, chemical formula: $C_{55}H_{98}O_6$*

7

8 http://en.wikipedia.org/wiki/Fatty_acid_metabolism

9 http://www.elmhurst.edu/~chm/vchembook/620fattyacid.html

10 http://www.merck.com/mmhe/sec12/ch152/ch152b.html

11 http://en.wikipedia.org/wiki/Fat#Importance_for_living_things

12 http://www.unisanet.unisa.edu.au/08366/h&p2fat.htm

for many tissues since they* can yield relatively large quantities of ATP. In particular, heart and skeletal muscle prefer fatty acids. The brain cannot use fatty acids as a source of fuel; it* relies on glucose, or on ketone bodies[13]. Ketone bodies are produced in the liver by fatty acid metabolism during starvation, or during periods of low carbohydrate intake.[14]

Energy Stores in Man[15]

Tissue Fuel	Reserve, grams	Starvation	Walking	Marathon
Fat	9000-15000	*34 days*	*11 days*	*3 days*
Muscle Glycogen	350	*14 hours*	*5 hours*	*70 minutes*
Liver Glycogen	80	*3.5 hours*	*70 minutes*	*18 minutes*
Blood/Extracellular Glucose	20	*40 minutes*	*15 minutes*	*4 minutes*
Body Protein	6000	*15 days*	*5 days*	*1.3 days*

***What do the following words refer to ?**

h. *"They* are stored in adipose tissue and…"* → "They" refers to …
i. *"Eventually, they* bind to the membranes of adipose cells or muscle, where they* are either stored or oxidized for energy"* → "They" refers to…
j. *"converting fat to energy is a slower* process"* → The process of converting fat into energy is slower than…
k. *"this* can be also converted into fat and stored"* → "This" refers to …
l. *"When required*"* → "Required" refers to…
m. *"a process* which is stimulated by adrenaline and glucagon"* → "Process" refers to…

n. *"When released* from the adipose tissue…"* → "Released" refers to…
o. *"they* can yield relatively large quantities of ATP"* → "They" refers to…
p. *"it* relies on glucose, or on ketone bodies"* → "It" refers to…

True or False ? (Be ready to explain and discuss).

iv. Fats yield more energy than carbohydrates.
v. In a healthy diet, most of the energy comes from fats.
vi. Fats and carbohydrates are first used for energy, and then stored if excess amounts are taken in.

Questions : (1) Ask questions about the following points, then (2) let someone else answer in a complete sentence (3) using as many of the suggested terms as possible.

HOW – WHEN – WHY – WHICH

5. *Digestion and distribution of* fats. → …

down into – then – and – lipoproteins – which circulate – and eventually

Fats are first …

6. *Conditions in which* fats are stored and used for energy. *The reasons for this.* → …

primarily – since – slower – than – used – when – insufficient – for example – or

Most of the time, fats are…

7. Tissues which can, or cannot, use fatty acids during hypoglycemia. → …

like – acids – ATP – cannot – and – therefore – dependent on – or – metabolized from – in extreme – (e.g. –)

Whereas certain tissues,…

8. Make up one original question of your own relating to this section of the article, and write a 2-3 line answer to it using information either from the article or from outside sources.

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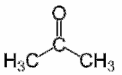
[13] 

Acetone, the simplest ketone. *A ketone is either the functional group characterized by a carbonyl group (C=O) linked to two other carbon atoms or a chemical compound that contains this functional group.*

[14] http://en.wikipedia.org/wiki/Fatty_acid#Free_fatty_acids

[15] www.medbio.info

Nutrients in the diet : Proteins

VOCABULARY ***in context.*** **Match the following definitions with words from the reading passage below, then give an appropriate translation in French.**

71. *Development; An increase in size, number, or strength :* _____

72. *To make structural repairs; reconstruct, restore :* _____

73. *Most important; principal; chief :* _____

74. *An organic compound containing both an NH_2 group and a carboxylic acid group (COOH), especially any of the 20 compounds that have the basic formula $NH_2CHRCOOH$, and that link together by peptide bonds to form proteins :* _____

75. *Symbol N A nonmetallic element that constitutes nearly four fifths of the air by volume, occurring as a colorless, odorless, almost inert diatomic gas, N_2, in various minerals and in all proteins. Atomic number 7; atomic weight 14 :* _____

76. *A water-soluble compound, $CO(NH_2)_2$, that is the major nitrogenous end product of protein metabolism and is the chief nitrogenous component of urine :* _____

77. *To separate and discharge (eliminate) waste matter from the blood, tissues, or organs :* _____

78. *The waste product secreted by the kidneys that is a yellow to amber-colored, slightly acid fluid discharged from the body through the urethra :* _____

79. *1. Basic or indispensable; necessary; 2. Biochemistry a substance that is required for normal functioning but cannot be synthesized by the body and therefore must be included in the diet :* _____

80. *A protein that contains all the essential amino acids in appropriate amounts to allow normal growth and tissue maintenance. :* _____

81. *A protein that is missing one or more of the amino acids necessary for normal metabolism; e.g. vegetable protein. :* _____

82. A cereal grass (Oryza sativa) that is cultivated extensively in warm climates for its edible grain. : _____

83. Any of various edible seeds of plants of the family Leguminosae used for food : _____

84. Any of various annual cereal grasses of the genus Triticum of the Mediterranean region and southwest Asia, especially T. aestivum, widely cultivated in temperate regions in many varieties for its commercially important edible grain. : _____

85. A widely grown, usually tall annual cereal grass (Zea mays) bearing grains or kernels on large ears. : _____

86. *To modify, especially to increase, the rate of a chemical reaction (without being consumed in the process). :* _____

87. *The chemical processes occurring within a living cell or organism that are necessary for the maintenance of life in which some substances are broken down to yield energy for vital processes while other substances, necessary for life, are synthesized. :* _____

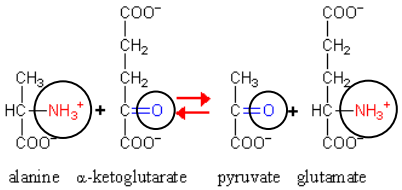
Proteins are essential for the growth and rebuilding of tissue, but they* can also be utilized as a source of energy. In some diets, such as the diet of the Eskimo, they* may at times even form the main source of energy[16]. Through the process of digestion, proteins are broken down into free amino acids that can be used for protein synthesis.[17] Proteins, unlike carbohydrates and fats, cannot be stored for future use. Excess protein is broken down and converted into sugars or fatty acids[18]. The liver removes nitrogen[19] from the amino acids, so that they* can be burned as fuel, and the nitrogen is incorporated into urea, the substance that is excreted by the kidneys in the urine.[20]

Proteins are described as essential and nonessential proteins or amino acids. The human body requires approximately 20 amino acids for the synthesis of its* proteins. The body can make only 12 of the amino acids – these are known as the nonessential amino acids because the body can make them* and does not need to get them* from the diet. There are 8 essential[21] amino acids that are obtained only from food, and not made in the body. If the protein in a food supplies enough of the

[16] The Inuit, or "Eskimos", consume a diet of foods that are fished, hunted, and gathered locally. This may include seals, beluga whale, caribou, polar bear, birds (including eggs) and fish. The traditional Inuit diet is thus low in carbohydrates and high in fat and animal protein. Although it is not possible to cultivate plants for food in the Arctic, the Inuit have traditionally gathered those that are naturally available, such as roots, berries and seaweed.

[17] http://en.wikipedia.org/wiki/Protein

[18] Amino acids fall into three categories : glucogenic, ketogenic, or glucogenic and ketogenic. Glucogenic amino acids are those that give rise to glucose via gluconeogenesis (production of glucose from other metabolites). All amino acids except lysine and leucine are at least partly glucogenic. Lysine and leucine are the only amino acids that are solely ketogenic. (cf. http://themedicalbiochemistrypage.org/amino-acid-metabolism.html)



[19] **Aminotransferase (Transaminase)**

Alanine (one of the simpler amino acids) loses its NH_3^+ (ammonia) group to become pyruvate, which can then be converted into glucose or fat.

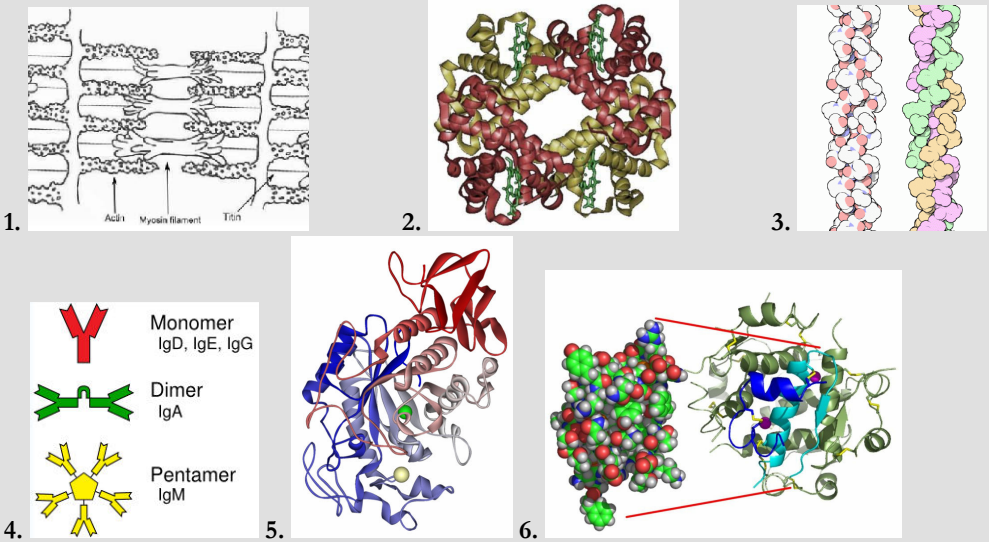
[20] http://en.wikipedia.org/wiki/Protein_in_nutrition

[21] Of the 20 standard amino acids, 8 are called essential amino acids because the human body cannot synthesize them from other compounds at the level needed for normal growth, so they must be obtained from food. The distinction between essential and non-essential amino acids is somewhat unclear, as some amino acids can be produced from others. Moreover, cysteine, tyrosine, histidine and arginine are semi-essential amino acids in children, because the metabolic pathways that synthesize these amino acids are not fully developed. The amounts required also depend on the age and health of the individual.

essential amino acids, it* is called a complete protein. All meat and other animal products are sources of complete proteins. If the protein of a food does not supply all the essential amino acids, it* is called an incomplete protein. Proteins in foods such as grains, fruits, and vegetables are either low, incomplete protein or lack one of the essential amino acids. Plant proteins can be combined to include all of the essential amino acids and form a complete protein. Examples of combined, complete plant proteins are rice and beans, milk and wheat cereal, and corn and beans.[22]

Food[23]	*Protein (grams)*	Food	*Protein (grams)*
Beef, 3 oz[24]	*27.0*	**Pinto beans, ½ cup**	*7.0*
Turkey breast, 3 oz	*25.7*	**Egg, 1 large (64g)**	*6.3*
Pork chop, 3 oz	*24.5*	**Almonds, 1 oz**	*5.4*
Chicken, 3 oz	*23.6*	**Green peas, ½ cup**	*4.1*
Tuna, 3 oz	*21.7*	**Corn, ½ cup**	*2.2*
Ham, 3 oz	*17.7*	**Potatoes, ½ cup**	*1.2*
Salmon, 3 oz	*16.8*	**Green beans, ½ cup**	*1.0*
Yogurt low-fat 1 cup	*10.7*	**Carrots, 1/2 cup**	*0.8*
Skim milk, 1 cup	*8.3*	**Apple**	*0*

Proteins are essential parts of all living organisms and participate in every process within cells. Many proteins are enzymes that catalyze biochemical reactions, and are vital to metabolism. Other proteins have structural or mechanical functions.



1. Contractile proteins (actin, myosin, titin) in muscle, 2. Hemoglobin, 3. Collagen, 4. Antibodies, 5. Salivary amylase (ptyalin), 6. Insulin, monomer (active form) left and hexamer (stored form) right

Protein is the main component of muscles, organs, and glands. Every living cell and all body fluids, except bile and urine, contain protein. The cells of muscles, tendons, and ligaments are maintained with protein. Children and adolescents require protein for growth and development. Adults need to eat about 60 grams of protein per day (0.8 grams per kilogram of weight or 10 to 15% of total calories). If more protein is consumed than is needed, the body does not build more protein (or muscle). Instead, the body breaks the protein down and stores its components as fat.[25]

The ***structure*** *of a protein determines its* ***function****. For example, collagen is long, stringy, strong, and resembles a rope. Hemoglobin on the other hand, is a globular protein that is folded and compact. Its spherical shape is useful for maneuvering through blood vessels.* [26]

Most proteins fold into unique ***3-dimensional*** *structures. Biochemists often refer to four distinct aspects of a protein's structure :*

- ***Primary*** *structure : the linear sequence of amino acids.*
- ***Secondary*** *structure : regularly repeating local structures stabilized by hydrogen bonds. The most common examples are the alpha helix, beta sheet and turns.*
- ***Tertiary*** *structure : the overall shape of a single protein molecule; the spatial relationship of the secondary structures to one another. The tertiary structure is what controls the basic function of the protein.*
- ***Quaternary*** *structure : the structure formed by several protein molecules (polypeptide chains), usually called protein subunits, which function as a single protein complex*

[22] http://www.nlm.nih.gov/medlineplus/ency/article/002467.htm
[23] http ://www.feinberg.northwestern.edu/nutrition/factsheets/protein.html
[24] NB. 1 ounce = 28.5 grams

[25] http ://www.merck.com/mmhe/sec12/ch152/ch152b.html
[26] http ://biology.about.com/od/molecularbiology/a/aa101904a.htm

Protein Function[27]

- ***Antibodies*** *are specialized proteins involved in defending the body from antigens (foreign invaders).*
- ***Contractile Proteins*** *are responsible for movement. Examples include* ***actin*** *and* ***myosin****. These proteins are involved in muscle contraction and movement.*
- ***Enzymes*** *are proteins that facilitate biochemical reactions. Examples include the enzymes lactase,* ***amylase*** *and* ***pepsin****.*
- ***Hormonal Proteins*** *are messenger proteins which help to coordinate certain bodily activities. Examples include* ***insulin****, oxytocin, and somatotropin (a growth hormone that stimulates protein production in muscle cells).*
- ***Structural Proteins*** *are fibrous and stringy and provide support. Examples include keratin in hair, or* ***collagen****, and elastin in tendons and ligaments.*
- ***Transport Proteins*** *are carrier proteins which move molecules from one place to another around the body. Examples include* ***hemoglobin*** *and albumin.*

***What do the following words refer to ?**

q. *"they* can also be utilized as a source of energy. In some diets … they* form the main source of energy"* → "They" refers to …
r. *"so that they* can be burned as fuel"* → "They" refers to …
s. *"for the synthesis of its* proteins"* → "Its" refers to…
t. *"because the body can make them* and does not need to get them* from the diet"* → "Them" refers to…
u. *"it* is called a complete protein"* → "It" refers to…
v. *"it* is called an incomplete protein"* → "It" refers to…

True or False ? (Be ready to explain and discuss).

vii. Proteins are mainly used either for building tissue or as a source of energy.
viii. Proteins are essential in the diet because the body cannot synthesize them.
ix. The shape (structure) of a protein determines its function.
x. The name "Eskimo" means "eaters of raw meat".
xi. In the Eskimo diet proteins form the main source of energy.

Questions : (1) Ask questions about the following points, then (2) let someone else answer in a complete sentence (3) using as many of the suggested terms as possible.

HOW (×2) – WHY – CAN – WHAT HAPPENS – WHAT – WHERE

9. ***The importance of*** **proteins for growth and energy.** ***The reason for this.*** **→ …**

essential for – (and also –) – not – main – in most – (except for –) – since – cannot

Although proteins …

10. ***The possibility of*** **storing proteins. Unused amino acids. → …**

proteins – unused – eventually – into – and – which – urine

Since the body …

11. ***The metabolism of*** **proteins. → …**

into – which – then – synthesize

Proteins are first …

12. **"Complete" proteins.** ***Dietary sources of*** **complete proteins. → …**

essential – i.e. – obtained from – or by+*v-ing* – complementary

"Complete" proteins contain…

13. **Make up one original question of your own relating to this section of the article, and write a 2-3 line answer to it using information either from the article or from outside sources.**

[27] http ://biology.about.com/od/molecularbiology/a/aa101904a.htm

The Process of Digestion : From the mouth to the stomach

VOCABULARY *in context*. Match the following definitions with words from the reading passage below, then give an appropriate translation in French.

88. *The process by which food is converted into substances that can be absorbed and assimilated by the body. It is accomplished in the alimentary canal by the mechanical and enzymatic breakdown of foods into simpler chemical compounds :* _____

89. *Material, usually of plant or animal origin, that contains or consists of essential body nutrients, such as carbohydrates, fats, proteins, vitamins, or minerals, and is ingested and assimilated by an organism to produce energy, stimulate growth, and maintain life; nourishment :* _____

90. *The body opening through which an animal takes in food. The cavity lying at the upper end of the alimentary canal, bounded on the outside by the lips and inside by the oropharynx and containing the tongue, gums, and teeth :* _____

91. *To bite and grind with the teeth; masticate :* _____

92. To cause to separate into pieces; To divide into pieces : _____

93. By that means; in this manner : _____

94. *The watery mixture of secretions from the oral glands that lubricates chewed food, moistens the oral walls, and contains ptyalin :* _____

95. To make wet (humid) : _____

96. To take through the mouth and throat into the stomach : _____

97. *A form of amylase in the saliva of human beings and some animals that catalyzes the hydrolysis of starch into maltose and dextrin :* _____

98. A complex carbohydrate, $(C_6H_{10}O_5)_n$, found chiefly in plants, notably in corn, potatoes, wheat, and rice, and commonly prepared as a white, amorphous, tasteless powder : _____

99. *A carbohydrate that cannot be decomposed by hydrolysis, especially one of the hexoses, having the general formula $C_6H_{12}O_6$; a monosaccharide :* _____

100. *The action of proteins functioning as biochemical catalysts :* _____

101. *The muscular, membranous tube for the passage of food from the pharynx to the stomach :* _____

102. *The opening from the esophagus into the stomach. :* _____

103. *The enlarged, saclike portion of the alimentary canal, one of the principal organs of digestion, located between the esophagus and the small intestine :* _____

104. *A structure within the body bounding, limiting or enclosing a space, cavity, chamber, or other anatomical unit. :* _____

105. *A material covering a surface; a single thickness; a stratum :* _____

106. *The viscous, slippery substance that consists chiefly of mucin, water, cells, and inorganic salts and is secreted as a protective lubricant coating by cells and glands of the mucous membranes :* _____

107. *To generate a substance from cells or bodily fluids :* _____

108. *Colorless, watery, acidic digestive fluid that is secreted by various glands in the mucous membrane of the stomach and consists chiefly of hydrochloric acid, pepsin, rennin, and mucin :* _____

109. *A clear, colorless, fuming, poisonous, highly acidic aqueous solution of hydrogen chloride, HCl, found in the stomach in dilute form :* _____

110. 1. More exactly; more accurately 2. On the contrary : _____

111. *A measure of the acidity or alkalinity of a solution, numerically equal to 7 for neutral solutions, sually measured on a scale of 0 to 14 :* _____

112. *A digestive enzyme found in gastric juice that catalyzes the breakdown of protein to peptide :* _____

113. *The intoxicating agent in fermented and distilled liquors; used pure or denatured as a solvent or in medicines and colognes and cleaning solutions and rocket fuel :* _____

114. *Acetylsalicylic acid, a nonsteroidal antiinflammatory drug having analgesic, antipyretic, antiinflammatory, and antirheumatic activity; also an inhibitor of platelet aggregation. :* _____

115. *A bitter white alkaloid often derived from tea or coffee and used chiefly as a mild stimulant and in the treatment of certain kinds of headache. :* _____

116. *A thin layer of tissue that covers a surface, lines a cavity, or divides a space or organ. :* _____

117. *Muscle tissue that contracts without conscious control, having the form of thin layers or sheets made up of spindle-shaped, unstriated cells with single nuclei and found in the walls of the internal organs, such as the stomach, intestine, bladder, and blood vessels, excluding the heart. :* _____

118. *A moving curve or succession of curves in or on a surface; an undulation :* _____

119. *The shortening and thickening of functioning muscle or muscle fiber in action :* _____

120. *The lengthening of inactive muscle or muscle fibers :* _____

121. *The wavelike muscular contractions of the alimentary canal by which contents are forced onward (forward) :* _____

122. *To pass over or through a surface with a continuous movement :* _____

123. To break, pound, or grind something into small fragments. : _____

124. To shake or agitate vigorously : _____

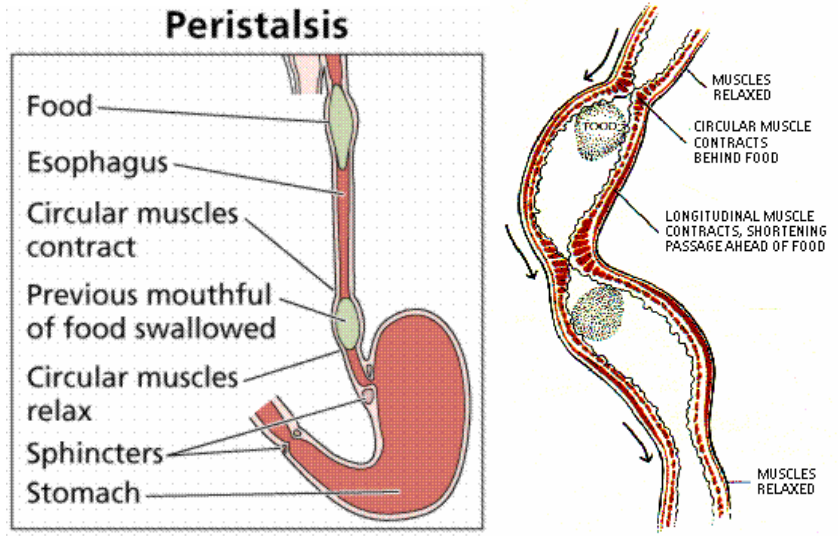
125. *A very small piece or part; a tiny portion; the smallest possible amount :* _____

126. *The thick semifluid mass of partly digested food that is passed from the stomach to the duodenum :* _____

The process of digestion begins when food is taken into the mouth. Chewing breaks the food into smaller pieces, thereby* exposing more surfaces to the saliva.

Saliva itself has a double function. It* moistens[28] the food, so facilitating swallowing, and it* contains ptyalin, which begins the conversion of starch into simple sugars.

Although enzymatic action begins in the mouth, the major processes of digestion do not occur until the food passes down the oesophagus and through the cardiac orifice into the stomach. The stomach has both a chemical and a physical function. The walls of the stomach, which* are protected by a layer of mucus, secrete gastric juices composed of several enzymes and hydrochloric acid. The acid itself does not break down food molecules, rather, the acid provides an optimum pH for the reaction of the enzyme pepsin, which begins the process of converting proteins into amino acids. A few lipid-soluble molecules such as alcohol, aspirin and caffeine are absorbed in the stomach by passing through the membrane of the stomach and entering the circulatory system directly. In addition, during these chemical reactions the layers of smooth muscle in the stomach wall produce waves of contraction and relaxation, known as peristalsis, which sweep the walls of the stomach, crushing and churning the food particles into a semi-solid mass known as chyme.



In much of the gastrointestinal tract, smooth muscles contract in sequence to produce a peristaltic wave which forces a ball of food (called a "bolus" while in the esophagus and "chyme" in the stomach) along the gastrointestinal tract. Peristaltic movement is initiated by circular smooth muscles contracting behind the chewed material to prevent it from moving back into the mouth, followed by a contraction of longitudinal smooth muscles which pushes the digested food forward.

***What do the following words refer to ?**

w. *"thereby* exposing more surfaces to the saliva"* → More surfaces are exposed to saliva by …

x. *"It* moistens the food, … and it* contains ptyalin,"* → "It" refers to …

y. *"which are protected by a layer of mucus"* → "Which" refers to …

True or False ? (Be ready to explain and discuss).

xii. *Enzymatic action mainly occurs in the mouth.*

xiii. *"Peristalsis" refers to the churning action of the stomach.*

xiv. *Absorption begins in the mouth, but mainly occurs in the stomach.*

Questions : (1) Ask questions about the following points, then (2) let someone else answer in a complete sentence (3) using as many of the suggested terms as possible.

HOW – WHAT

14. *The importance of* chewing and saliva in digestion. → …

by+V-ING – smaller – and – more – which – lubricant – more easily – and also – conversion – into – with

Chewing helps prepare …

15. The 2 functions of the stomach. → …

food – by – juices – including – acid – and – such as – which breaks – while – function – into – by

The chemical …

16. Make up one original question of your own relating to this section of the article, and write a 2-3 line answer to it using information either from the article or from outside sources.

[28] *Cf. listen, fasten, soften, often, mustn't. ; castle, thistle, whistle.*

The Process of Digestion : The small and large intestines

VOCABULARY *in context*. Match the following definitions with words from the reading passage below, then give an appropriate translation in French.

127. *The passage at the lower end of the stomach that opens into the duodenum :* _____

128. *The narrow, winding, upper part of the intestine where digestion is completed and nutrients are absorbed by the blood. It extends from the pylorus to the cecum and consists of the duodenum, the jejunum, and the ileum :* _____

129. *The beginning part of the small intestine, starting at the lower end of the stomach and extending to the jejunum. :* _____

130. A small spherical mass, especially a small drop of liquid : _____

131. In addition or furthermore : _____

132. *A bitter, alkaline, brownish-yellow or greenish-yellow fluid that is secreted by the liver, stored in the gallbladder, and discharged into the duodenum and aids in the emulsification, digestion, and absorption of fats. Also called gall :* _____

133. *A small, pear-shaped muscular sac, located under the right lobe of the liver, in which bile secreted by the liver is stored until needed by the body for digestion :* _____

134. *To mix two liquids that ordinarily do not mix well (such as oil and water) by making a suspension of tiny droplets of one liquid in the second liquid :* _____

135. To cause an acidic solution to become neutral by adding a base to it (or to cause a basic solution to become neutral by adding an acid to it) : _____

136. *A clear alkaline secretion of the pancreas containing enzymes that aid in the digestion of proteins, carbohydrates, and fats. :* _____

137. *A long, irregularly shaped gland, lying behind the stomach, that secretes enzymes that aid in digestion into the duodenum and insulin, glucagon, and somatostatin into the bloodstream :* _____

138. A number or collection of varied things, especially of a particular group; an assortment : _____

139. *Having a pH greater than 7. Having a relatively low concentration of hydrogen ions. :* _____

140. *An atom or a group of atoms that has acquired a net electric charge by gaining or losing one or more electrons. :* _____

141. *To prepare, treat, or convert :* _____

142. *A class of water-soluble crystalline carbohydrates, including sucrose and lactose, having a characteristically sweet taste and classified as monosaccharides, disaccharides, and trisaccharides :* _____

143. To take effect; to proceed : _____

144. Internal, interior : _____

145. Exceptionally small; microscopic, minuscule : _____

146. Resembling, similar to a hair (filament) : _____

147. *A minute projection arising from a mucous membrane, especially : One of the numerous vascular projections of the small intestine :* _____

148. *One of the minute blood vessels that connect arterioles and venules. These blood vessels form an intricate network throughout the body for the interchange of various substances, such as oxygen and carbon dioxide, between blood and tissue cells :* _____

149. *A canal or other tube that contains or conveys (transports) lymph :* _____

150. *Numerous minute intestinal lymph-carrying vessels that convey chyle from the intestine to lymphatic circulation and thereby to the thoracic duct :* _____

151. A very sweet sugar, $C_6H_{12}O_6$, occurring in many fruits and honey and used as a preservative for foodstuffs and as an intravenous nutrient : _____

152. A monosaccharide, $CH_2OH\ (CHOH)_4CHO$, commonly occurring in lactose and in certain pectins, gums, and mucilages : _____

153. *A source of nourishment, especially an ingredient in a food. :* _____

154. *A vein that conducts blood from the digestive organs, spleen, pancreas, and gallbladder to the liver.:* _____

155. Resembling milk in color not clear : _____

156. *A milky fluid consisting of lymph and emulsified fat extracted from chyme by the lacteals during digestion and passed to the bloodstream through the thoracic duct. :* _____

157. To become combined or united. : _____

158. *The main duct of the lymphatic system, ascending through the thoracic cavity in front of the spinal column and discharging lymph and chyle into the blood through the left subclavian vein. :* _____

159. *A part of a major vein of the upper extremities or forelimbs that passes beneath the clavicle and is continuous with the axillary vein (a continuation of the axillary vein; joins the internal jugular to form the brachiocephalic vein) :* _____

160. In or through all parts; everywhere : _____

161. *The portion of the intestine that extends from the ileum to the anus, forming an arch and including the cecum, colon, rectum, and anal canal :* _____

162. *Waste matter eliminated from the bowels; excrement :* _____

163. *The longest part of the large intestine, extending from the cecum to the rectum. Water and electrolytes are absorbed, solidified, and prepared for elimination as feces. It also contains bacteria that help in the body's absorption of nutrients from digested material. :* _____

164. Continuing to be in the same place : _____

165. *1. An unusable or unwanted substance or material 2. The undigested residue of food eliminated from the body; excrement. :* _____

166. *The lower part of the alimentary canal; intestine :* _____

167. Without being exact; imprecise but mostly correct, approximately : _____

168. *Undigested food and other waste that is eliminated through the anus. Syn. feces :* _____

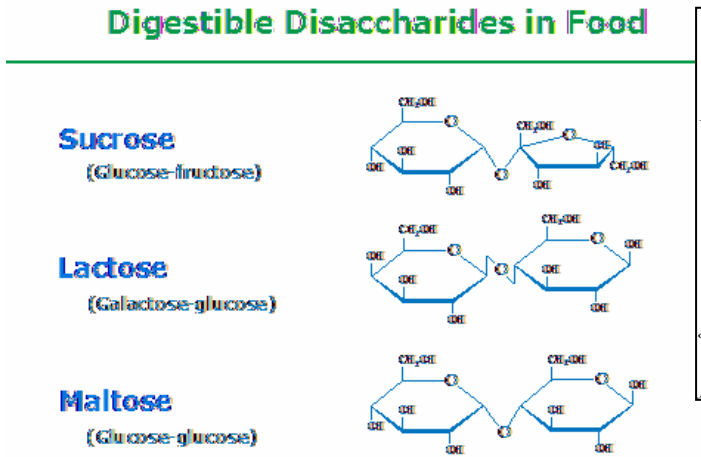
169. *The terminal portion of the large intestine, extending from the sigmoid flexure to the anal canal. :* _____

170. *To make mention or reference. To use a name to designate :* _____

171. *The intestine (often used in the plural). :* _____

172. *The discharge of waste matter from the large intestine; defecation. :* _____

From the stomach, the chyme passes through the pyloric sphincter into the first segment of the small intestine, known as the duodenum. Much undigested material is still present*. Proteins have not been completely broken down, starches are still being converted into simple sugars, and fats remain in large globules.



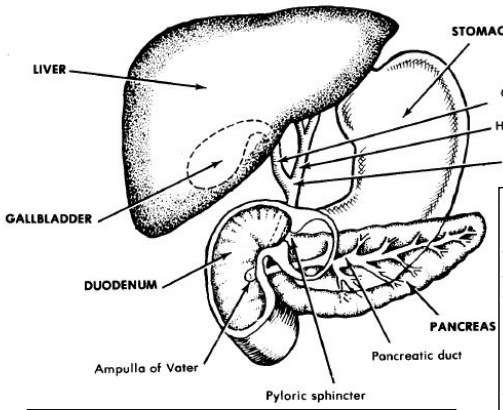
Disaccharides :
1. Lactose, 2. Sucrose (saccharose), 3. Maltose
A disaccharide is a sugar (a carbohydrate) composed of two monosaccharides. It is formed when two sugars are joined together and a molecule of water is removed. For example, milk sugar (lactose) is made from glucose and galactose, whereas cane sugar (sucrose) is made from glucose and fructose.

29

As chyme enters the duodenum, it* is further mixed with three different liquids :

- Bile, which is secreted by the liver and released by the gall bladder, emulsifies fats to allow absorption, neutralizes the chyme, and is used to excrete waste products (especially bilirubin, a byproduct of red blood cells recycled by the liver). It* is not an enzyme, however.
- Pancreatic juice, made by the pancreas, contains a variety of enzymes (cf. infra) such as trypsin and chymotrypsin, which break down proteins, and amylase which hydrolyzes starch. Pancreatic juice is alkaline in nature due to the high concentration of bicarbonate ions. This* is useful in neutralizing the acidic gastric acid, allowing for effective enzymatic action.
- Intestinal enzymes of the alkaline mucosal membranes include maltase, lactase and sucrase, to process sugars.

Bile *Bile is produced by hepatocytes in the liver, while epithelial cells add a watery solution that is rich in bicarbonates. Bile then flows into the common hepatic duct, the common bile duct and finally the pancreatic duct to empty into the duodenum. If the duct is closed, bile instead flows into the* ***gall bladder****, where it is stored and concentrated. When food is released by the stomach into the duodenum in the form of* ***chyme****, the gallbladder releases the concentrated bile to complete digestion.*
Bile acts as a detergent, helping to ***emulsify fats*** *(increasing surface area to help enzyme action), and thus is important in the absorption of the fat-soluble vitamins D, E, K and A.*
Besides its digestive function, bile serves to eliminate the hemoglobin breakdown product (bilirubin) which gives bile its colour, and neutralises any excess stomach acid. Bile salts are also bacteriocidal to the invading microbes that enter with food.



Intestinal enzymes *The jejunum and ileum secrete a juice called succus entericus which contains the following:*
- ***Sucrase*** *(invertase), which breaks down sucrose into glucose and fructose*
- ***Maltase****, which breaks down maltose into glucose.*
- ***Lactase****, which breaks down lactose into glucose and galactose*
- ***Intestinal lipase****, which breaks down fatty acids*
- ***Erepsin****, also a protein-digesting enzyme*

Pancreatic enzymes *The pancreas is the main digestive gland in our body. It secretes the enzymes :*
- ***Trypsin*** *and* ***Chymotrypsin****, peptidases, like pepsin in the stomach.*
- ***Steapsin*** *(pancreatic lipase) which decomposes fats into glycerin and fatty acids.*
- ***Pancreatic amylase*** *which degrades most hydrocarbons, including starch and glycogen, but not cellulose.*
- *Several* ***nucleases*** *that degrade nucleic acids, like DNAase and RNAase*

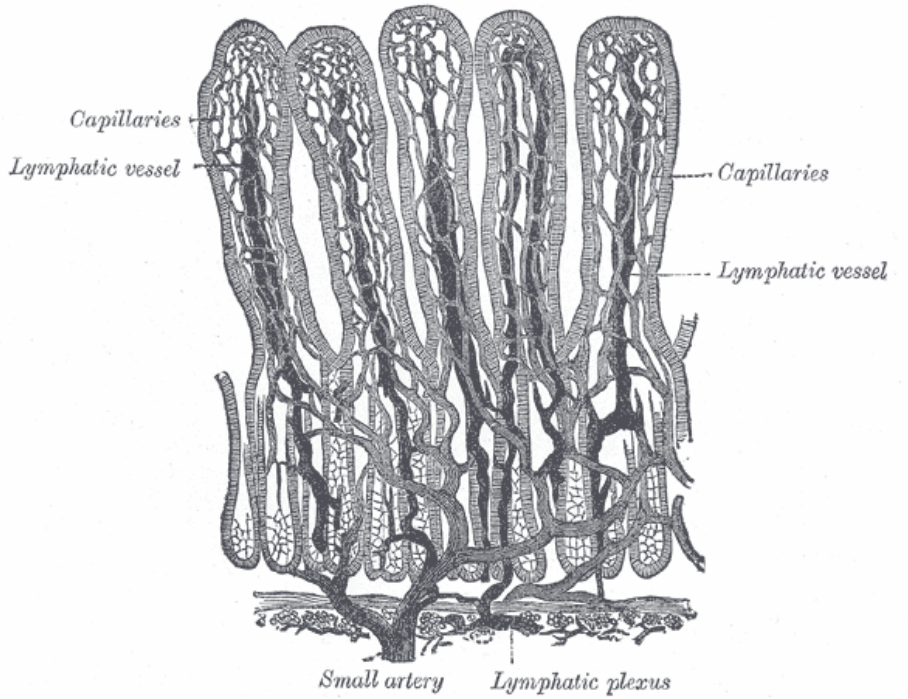
30

Absorption of the products of digestion takes place mainly through the wall of the small intestine. Its* inner surface is covered with minute hair-like structures called villi. Each villus contains several blood capillaries and a specialized lymphatic vessel, known as a lacteal. Glucose, fructose, galactose and the amino acids are all absorbed directly into the blood by entering the blood capillaries inside the villi. The blood, which has absorbed nutrients, is carried away from the small intestine via the hepatic portal vein and goes to the liver for filtering, removal of toxins, and nutrient processing. Glycerol and the fatty acids, on the other hand, pass into the lacteals. The combination of fat and lymph in the lacteals is milky in appearance and is called chyle. Individual lacteals merge to form larger lymphatic

[29] http ://www.medbio.info/Horn/Time%201-2/CarbChem1.htm

[30] *adapted from* : http ://www.free-ed.net/sweethaven/MedTech/NurseCare/GastroNurse01.asp?iNum=8 *and Wikipedia.*

vessels that transport the fats to the thoracic duct which empties into the left subclavian vein. At this point, the fats are in the bloodstream. They can be converted to lipoproteins (HDL, LDL or VLDL) in the liver or be transported to tissues throughout the body and stored in adipose cells as triglycerides.



Villi of small intestine, showing blood vessels and lymphatic vessels (lacteals).
A lacteal is a lymphatic capillary that absorbs dietary fats in the villi of the small intestine.

Foods which are still undigested pass on in a liquid state into the large intestine, and are now called faeces. The large intestine, an organ which is now more often called by its Greek name, the colon, is the last part of the digestive system. Although its* function is primarily to absorb the remaining water from indigestible food matter (wastes), it* also contains significant numbers of bacteria known as "gut flora" which continue to break down faeces through fermentation, producing a few useful nutrients such as vitamins and short-chain fatty acids. After roughly 30 hours, fecal matter or "stool" is finally expelled from the rectum, the terminal portion of the large intestine, by a peristaltic contraction commonly referred to as a bowel movement.

The Process of Digestion (Synopsis) :

Region	Agent / Action	Effects
Mouth	Chewing	Break the food into smaller pieces. Expose more surface area.
	Saliva	Moisten food to facilitate swallowing
	Ptyalin	Begin the conversion of starch into simple sugars
Stomach	Pepsin	Begin the process of converting proteins into amino acids
	Peristalsis	Churn the food particles into a semi-solid mass known as chyme
Small Intestine	Bile	Complete the digestion of proteins, starches and fats
	Pancreatic enzymes	
	Intestinal enzymes	
	Blood Capillaries (inside the villi)	Absorb glucose, fructose, galactose and amino acids into the bloodstream
	Lacteals (inside the villi)	Absorb glycerol and fatty acids into the lymph
	Peristalsis	Move chyme, promote absorption
Large intestine (colon)	Intestinal wall	Absorb water (and some products of fermentation : vitamins, short-chain fatty acids)
	Bacterial flora	Fermentation
	Peristalsis	Excrete feces

***What do the following words refer to ?**

z. *"Much undigested material is still present*"* → "Present" means in the…
aa. *"it* is further mixed"* → "It" refers to…
bb. *"It* is not an enzyme, however"* → "It" refers to…
cc. *"This* is useful in neutralizing the acidic gastric acid"*→ "This" refers to…

dd. *"Its* inner surface is covered with … villi"* → "Its" refers to …
ee. *"Although its* function is primarily to absorb the remaining water … it* also contains significant numbers of bacteria…"* → "Its" and "it" refer to …

True or False ? (Be ready to explain and discuss).

xv. In every organ of the digestive tract, different enzymes are secreted to break down different nutrients.
xvi. Foods are completely digested in the small intestine.
xvii. All carbohydrates are eventually broken down into glucose and absorbed.
xviii. The work of digestion is primarily accomplished by enzymes.

Questions : (1) Ask questions about the following points, then (2) let someone else answer in a complete sentence (3) using as many of the suggested terms as possible.

WHERE (×3) – HOW (×2)

17. ***The region in which*** **the digestion of food is completed.** ***The means by which this is accomplished.*** **→ …**

in the – by – action of – and – which – secreted by – and

The conversion …

18. ***The place and manner in which*** **nutrients are absorbed. → …**

in the – of – small – Simple – and – acids – blood – directly – whereas – and – through – into – which – to

All nutrients are …

19. ***Region(s) in which*** **the major processes of digestion occur. → …**

mouth – major – in the – which – into chyme – and begins – proteins – as well as in – where – completed by – and – and – absorbed by – villi

Although the process …

20. Make up one original question of your own relating to this section of the article, and write a 2-3 line answer to it using information either from the article or from outside sources.

Nutritional disorders : Obesity

VOCABULARY *in context*. Match the following definitions with words from the reading passage below, then give an appropriate translation in French.

173. *An abnormal accumulation of body fat, usually 20% or more over an individual's ideal body weight :* _____

174. *A measurement of the relative percentages of fat and muscle mass in the human body, in which mass in kilograms is divided by height in meters squared and the result used as an index of obesity. :* _____

175. *1 more than normal in body weight after adjustment for height, body build, and age, or 10% to 20% above the person's "desirable" body weight. 2 a body mass index between 25.0 and 29.9. :* _____

176. *1. The force with which a body is attracted to Earth and which is equal to the product of the object's mass and the acceleration of gravity. 2. A measure of the heaviness of an object. :* _____

177. *1. The distance from the base of something to the top. 2. Stature, especially of the human body. :* _____

178. The product obtained when a number or quantity is multiplied by itself : _____

179. *The part of the human trunk between the bottom of the rib cage and the pelvis. :* _____

180. *The region of the body around the articulation of the femur and the pelvis. :* _____

181. *To an increasing extent, continuously more :* _____

182. *A specialized agency of the United Nations that acts as a coordinating authority on international public health and whose objective is "the attainment by all peoples of the highest possible level of health." Its major task is to combat disease, especially key infectious diseases, and to promote the general health of the peoples of the world. :* _____

183. Of, relating to, or involving the entire earth; worldwide : _____

184. 1. To obtain or acquire 2. To put on weight : _____

185. 1. To cause to undergo combustion.2. To consume (fuel or energy, for example) : _____

186. *1. Cessation of work, exertion, or activity. 2. Sleep or quiet relaxation :* _____

187. *To come about as a consequence ; to emerge from something; to be the outcome of something :* _____

188. *Abnormality of function; a morbid physical or mental state :* _____

189. *A quantity that is added; the process of becoming larger or longer or more numerous or more important :* _____

190. For the most part; mainly : _____

191. The quality of being present and accessible : _____

192. A favorable or advantageous circumstance ; a possibility due to a favorable combination of circumstances : _____

193. Absent, out of existence : (_____

194. A lifting device consisting of a platform or cage that is raised and lowered mechanically in a vertical shaft in order to move people from one floor to another in a building : _____

195. A device used to control an apparatus or machine from a distance : _____

196. 1. To pay out (money).2. To pass (time) in a specified manner or place : _____

197. *(Something) done sitting down and involving very little exercise :* _____

198. 1. To put through the steps of a prescribed procedure. 2. To prepare, treat, or convert by subjecting to a special process : _____

199. 1. Personal comfort or advantage: services that promote the customer's convenience. 2. Something that increases comfort or saves work : _____

200. A light quick meal eaten between or in place of main meals : _____

201. Any drink other than water : _____

202. *Considering, taking into account, for example :* _____

203. A unit of volume or capacity in the U.S. Customary System, used in liquid measure, equal to 29.57 milliliters : _____

204. *To have as a result, to end in a particular way :* _____

205. A unit of weight equal to 16 ounces (453.592 grams) : _____

206. For each one : _____

207. Easily perceived; quite apparent : _____

208. *1. Including everything; comprehensive: the overall costs of medical care. 2. Regarded as a whole; general :* _____

209. *A feeling of difficult or labored breathing that is out of proportion to the patient's level of physical activity, a.k.a. dyspnea :* _____

210. *A sound generated during sleep by vibration of loose tissue in the upper airway :* _____

211. *The site of junction or union between bones, especially one that allows motion of the bones :* _____

212. *The posterior part of the trunk from the neck to the pelvis :* _____

213. *An unpleasant sensation occurring in varying degrees of severity as a consequence of injury, disease, or emotional disorder ; physical hurt or discomfort caused by injury or illness :* _____

214. *A set of attitudes, habits, and possessions regarded as typical of a particular group or an individual :* _____

215. 1. The act of losing 2. the amount (of something) lost : _____

216. Pertaining to the study, prevention, or treatment of overweight : _____

217. 1. An amount or extent of variation. 2. Mathematics The set of all values a given function may take on. 3. A whole set of related things. : _____

218. An individual portion of food or drink. : _____

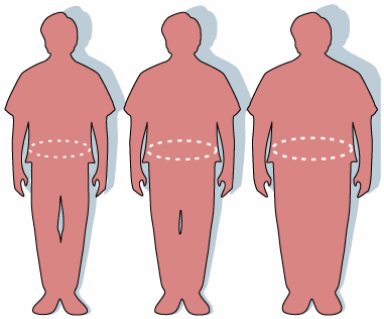
219. Containing little or no fat. : _____
220. To shift, transfer, or divert. To exchange. : _____
221. Made from the entire grain or seed : _____
222. Steps going from one level to another, usually indoors : _____
223. 1. Tending or inclined 2. Probable : _____
224. *The actions or reactions of a person in response to external or internal stimuli. :* _____
225. An aim or purpose, an objective : _____
226. Continuing for a lifetime : _____
227. An intense but short-lived fashion : _____
228. 1. To have as a necessary condition 2. to insist upon : _____
229. Responsibility to someone or for some activity : _____

Obesity

Obesity is the accumulation of excessive body fat. The **body mass index (BMI)** is used to define overweight and obesity. BMI is weight (in kilograms) divided by height (in meters squared). Overweight is usually defined as a BMI of 25 to 29.9. Obesity is defined as a BMI of 30 or higher, and is considered to be severe if BMI is 40 or higher.

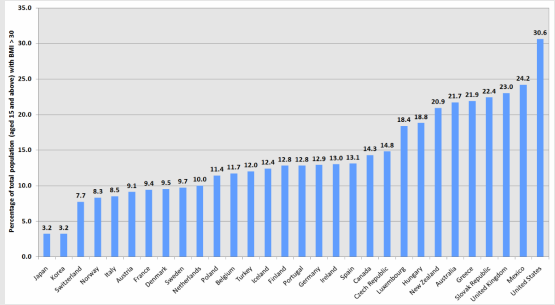
The waist circumference (>102 cm in men and >88 cm in women) and the waist–hip ratio (the circumference of the waist divided by that* of the hips of >0.9 for men and >0.85 for women) are both used as measures of central (abdominal) obesity. Intra-abdominal or visceral fat has a particularly strong correlation with cardiovascular disease, and excessive waist circumference is an indicator used in the diagnosis of metabolic syndrome.

BMI	Classification
< 18.5	underweight
18.5–24.9	normal weight
25.0–29.9	overweight
30.0–34.9	class I obesity
35.0–39.9	class II obesity
> 40.0	class III obesity



Silhouettes and waist circumferences representing : normal (33 in/84 cm), overweight (45 in/114 cm), and obese (60 in/152 cm)

Obesity has become increasingly common throughout the world. In 1997 the World Health Organization (WHO) formally recognized obesity as a global epidemic. As of 2005 the WHO estimates that at least 400 million adults are obese. In the United States, 34% of adults, 72 million people, are obese, and over 17% of children and adolescents are overweight or obese. Obesity is much easier to prevent than treat. Once people gain excess weight, the body resists losing weight by increasing appetite and reducing the number of calories burned during rest (energy expenditure).

1. 

2.

1. Percentage of total adult population (aged 15 and above) with a BMI >30 1996-2003
2. Prevalence of obesity between 1960 and 2004 in the USA. *Obesity in the United States has been increasingly cited as a major health issue in recent decades. American obesity rates are among the highest in the world with 66% of adults being overweight or obese, and 34% obese. Should*[31] *current trends continue, 75% of adults in the US are projected to be overweight and 41% obese by 2015.*

Causes

Obesity can result from certain disorders, but the increase in obesity results largely from environmental changes that have increased the availability of high-calorie foods and reduced the opportunity for physical activity.

In developed countries, opportunities for physical activity have been engineered away[32] by technological advances, such as elevators, cars, and remote controls. More time is spent doing sedentary activities such as using the computer, watching

[31] NB. L'inversion avec "*should*" en début de phrase a une valeur d'hypothèse : *Should current trends continue… = If current trends continue…* Par rapport à une hypothèse classique en "*if*", "*should*" présente la réalisation de l'hypothèse comme quelque chose de difficile à concevoir. Ces notions d'hypothèse et de réalisation incertaine sont déjà présentes dans le sens traditionnel de "*should*", à savoir le conseil laissé au bon vouloir de l'interlocuteur : *si tu veux mon avis, tu devrais le faire, mais le feras-tu réellement ? à toi de voir…*

[32] NB. La construction verbe+adverbe en anglais donne souvent lieu à une transposition entre les deux termes en français : "*away*" ⇒ éliminer, faire disparaître / "*engineer*" ⇒ par la mécanique, par la technologie.

television, and playing video games. Sedentary people use fewer calories than more active people and thus* require fewer calories in the diet.

Moreover, the diet in developed countries is energy dense. Foods contain more processed carbohydrates, more fat, and less fiber. Convenience foods, such as energy-dense snacks, contribute to the increase in obesity. High-calorie beverages, including soda, juices, coffee drinks, and alcohol, also contribute significantly. For example, a 12-ounce coffee beverage can have 500 or more calories. An additional 500 calories per day results in a weight gain of 1 pound (450g) per week.

1.

2.

[33]

1. Dunkin' Donuts Chocolate Chip Muffin *590 calories, 24 grams of fat*

2. Starbucks Grande White Chocolate Mocha *480 calories, 20 grams of fat*

Symptoms

The most obvious and only true symptom of obesity is a change in overall appearance. However, being obese also increases the risk of many health problems and doubles or triples the risk of early death. Virtually every organ system can be affected. These weight-related health problems can cause symptoms, such as shortness of breath, difficulty breathing during activity, snoring, skin abnormalities including acne, and joint and back pain.

Obesity increases the risk of the following health problems :

- High cholesterol levels
- High blood pressure
- Metabolic syndrome
- Coronary artery disease
- Heart failure
- Diabetes or a high blood sugar level (insulin resistance or pre-diabetes)
- Cancer of the breast, uterus, ovaries, colon, prostate, kidneys, or pancreas
- Gallstones and other gallbladder disorders
- A low testosterone level, erectile dysfunction, and reduced fertility in men
- Menstrual disorders, infertility, and increased risk of miscarriage in women
- Skin abnormalities, including acne and facial hair in women
- Varicose veins
- Fatty liver, hepatitis, and cirrhosis
- Blood clots (deep venous thrombosis and pulmonary embolism)
- Asthma
- Obstructive sleep apnea
- Kidney disorders, including nephrotic syndrome
- Arthritis, gout, low back pain, and other joint disorders
- Depression and anxiety

Treatment

The main treatment for obesity is changing lifestyle, which* includes changes in diet, increased physical activity, and behavioral modification to help with weight loss and maintenance. Some people may also need to take drugs or to have weight-loss (bariatric) surgery.

Weight loss requires consuming fewer calories than the body uses. Healthy eating for weight loss requires reducing the number of calories consumed and choosing a wide range of foods that provide good nutrition. Reducing the number of calories by 500 to 1000 calories a day results in weight loss of 1 to 2 pounds per week, which* is a healthy rate. This* usually means consuming 1200 to 1500 calories a day.

The following changes in diet are recommended :

- Eating 5 or more servings of fruits and vegetables a day
- Eating lean protein—for example, fish or chicken breast or vegetable protein, such as soy
- Switching to no-fat dairy products (e.g. skim milk instead of whole milk)
- Eating whole grains
- Eliminating high-calorie beverages
- Limiting consumption of restaurant and fast food
- Switching from harmful fats, such as saturated fat, to good fats, such as monounsaturated fats (found in olive and canola oils) and polyunsaturated fats (in deep-sea fish and vegetable oils) and limiting the amount of fat consumed.

[33] Source : http://www.everydayhealth.com/photogallery/starbucks-grande-white-chocolate-mocha-the-snack-food-hall-of-shame.aspx

Increasing physical activity is essential to healthy weight loss and weight maintenance. Physical activity includes not only exercise but also lifestyle activities, such as taking the stairs instead of the elevator, gardening, and walking instead of driving. Also, physical activity helps people maintain weight loss. People who do not exercise while dieting are more likely to regain the weight they lose.

Activity (30 min)[34]	Calories burned *by a 65-kg person*	Calories burned *by a 100-kg person*
Aerobics	*193*	*297*
Bicycling	*210*	*323*
Climbing stairs	*292*	*449*
Gardening	*154*	*238*
Jogging	*322*	*495*
Karate	*210*	*323*
Ping Pong	*129*	*198*
Rugby	*326*	*502*
Skiing (cross-country)	*262*	*403*
Swimming	*137*	*211*
Walking	*99*	*152*
Watching TV	*34*	*53*

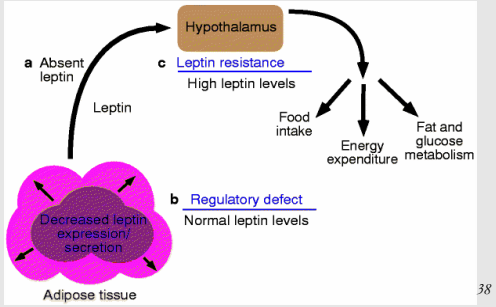
Unfortunately, success rates of long-term weight loss maintenance are low, as most (80-95%[35][36]) of the people who lose weight regain it* within five years. Ultimately, for weight loss to be effective and long-lasting, people must change their behavior. People who are most successful have realistic goals and recognize that healthy weight loss can be achieved only with lifelong lifestyle changes rather than a fad diet that cannot be sustained. Weight-loss programs that help people change their behavior are the most effective. Programs that require regular contact, such as Overeaters Anonymous (OA), and commercial programs like Weight Watchers, increase accountability and can increase success rate.

Genetics and Obesity[37]

Like many other medical conditions, obesity is the result of an interplay between genetic and environmental factors.

The first "obesity" gene "ob" and its product, "leptin", were discovered in mice in 1994. Leptin is a hormone produced in adipose tissue which circulates at levels proportional to body fat and acts on receptors in the hypothalamus to regulate food intake and stimulate energy expenditure.

1.

2. 

[38]

1. A comparison of a mouse unable to produce leptin thus resulting in obesity (left) and a normal mouse (right). 2. Leptin and the regulation of body weight

After the discovery of leptin, many hoped that it could be used as a wonder drug to "cure" obesity. (A few months after the first study was published, an American pharmaceutical company, Amgen, paid $20 million to acquire the patent for leptin). However, leptin deficiency and leptin receptor deficiency are rare conditions in humans, and aside from a few cases, studies have shown that most obese persons have in fact developed a resistance to leptin, not a deficiency.

Since the 1990s several other obesity genes have been identified, including MC4R (melanocortin 4 receptor) and FTO (fat mass and obesity associated gene), but contrary to early expectations most of these genes seem to influence appetite and satiety rather than metabolism.

***What do the following words refer to ?**

ff. *"divided by that* of the hips"* → "That" refers to …

gg. *"and thus* require fewer calories in the diet"* → "Thus" refers to the fact that …

hh. *"which* includes changes in diet, increased physical activity, and behavioral modification"* → "Which" refers to …

[34] http://exercise.about.com/cs/fitnesstools/l/blcalorieburn.htm
[35] http://www.ajcn.org/cgi/content/full/82/1/222S
[36] http://www.medicinenet.com/obesity_weight_loss/page6.htm

[37] Sources : *http://en.wikipedia.org/wiki/Obesity ; http://en.wikipedia.org/wiki/Leptin ; http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1642700 ; Fat: fighting the obesity epidemic, Robert Pool, Oxford University Press, 2001*
[38] http://www.nature.com/nature/journal/v395/n6704/fig_tab/395763a0_F4.html

ii. *"which* is a healthy rate"* → "Which" refers to …
jj. *"This* usually means consuming 1200 to 1500 calories a day"* → "This" refers to …

kk. *"regain it* within five years"* → "It" refers to …

True or False ? (Be ready to explain and discuss).

xix. BMI is the best and most widely used diagnostic tool to identify whether individuals are underweight, overweight or obese.
xx. Eating a healthy diet is the best way to prevent obesity, but exercise is more effective as a treatment.
xxi. Rates of obesity and overweight have increased most dramatically since the release of "Pac Man"[39] in 1980.
xxii. One pound (454 g) of body fat stores about 3,500 calories.
xxiii. Reducing calories in the diet is easier than burning calories through exercise.
xxiv. Healthy weight-loss diets are high in protein, and low in carbohydrates.

Questions : (1) Ask questions about the following points, then (2) let someone else answer in a complete sentence (3) using as many of the suggested terms as possible.

WHAT (×4) – HOW MUCH – HOW MANY – WHERE

21. Criteria on *which* doctors base the diagnosis of obesity and overweight. *The amount of* weight *that* is considered unhealthy. → …

based on – such as – i.e. – divided by – and also – waist – over 25 – considered – and – waist – greater – or – women – in particular – risk of – and

Doctors diagnose …

[39] *Immensely popular in the United States from its original release in 1980 to the present day, Pac-Man is universally considered as one of the classics, virtually synonymous with video games, and an icon of 1980s pop culture. The player guides Pac-Man through a maze, eating "pac-dots". Four ghosts roam the maze, trying to catch Pac-Man.*

Screenshot of the original arcade version of Pac-Man

22. *The prevalence, distribution and causes of* obesity. → …

to the point that – recognized as – people – especially in – where – and drinks – and – processed – increasingly – while – amount of – spent – which – fewer

Rates of obesity …

23. Conditions necessary for weight loss to occur. *The means to* achieve the goals of weight loss and long-term maintenance. → …

only – if – fewer – consumed – than – two means – by – intake – and increasing – expenditure – Maintaining – changes – habits, – such as – as well as – lifestyle

Weight loss can …

24. Make up one original question of your own relating to this section of the article, and write a 2-3 line answer to it using information either from the article or from outside sources.

Read Case History 1, and use the table on the following page to imagine a realistic weight-loss diet for "Mike". Calculate the total number of calories and the percentage of calories from fat.

Breakfast :

Lunch :

Dinner :

Food :	Quantity	Wt. (grams)	KCal	Fat (g.)	Carb (g.)	Prot. (g.)
Apple juice	*1 cup*	*248*	*115*	*0*	*29*	*0*
Apples	*1 apple*	*138*	*80*	*0*	*21*	*0*
Bananas	*1 banana*	*114*	*105*	*1*	*27*	*1*
Beef roast, rib	*3 oz*	*85*	*315*	*26*	*0*	*19*
Beer, regular	*12 fl oz*	*360*	*150*	*0*	*13*	*1*
Beets, cooked	*2 beets*	*100*	*30*	*0*	*7*	*1*
Blue cheese	*1 oz*	*28.35*	*100*	*8*	*1*	*6*
Blueberry muffins	*1 muffin*	*45*	*140*	*5*	*22*	*3*
Broccoli, raw	*1 spear*	*151*	*40*	*1*	*8*	*4*
Butter	*1 tbsp*	*14*	*100*	*11*	*0*	*0*
Cabbage	*1 cup*	*70*	*15*	*0*	*4*	*1*
Carrots, cooked	*1 cup*	*156*	*70*	*0*	*16*	*2*
Carrots, raw	*1 carrot*	*72*	*30*	*0*	*7*	*1*
Cauliflower, cooked	*1 cup*	*125*	*30*	*0*	*6*	*2*
Cheeseburger	*1 sandwh*	*112*	*300*	*15*	*28*	*15*
Cheesecake	*1 piece*	*92*	*280*	*18*	*26*	*5*
Chicken, fried	*4.9 oz*	*140*	*365*	*18*	*13*	*35*
Chicken, roasted	*3.0 oz*	*86*	*140*	*3*	*0*	*27*
Chocolate (dark)	*1 oz*	*28.35*	*150*	*10*	*16*	*1*
Chocolate chip cookies	*4 cookies*	*40*	*185*	*11*	*26*	*2*
Coffee/Tea	*6 fl oz*	*180*	*0*	*0*	*0*	*0*
Cola	*12 fl oz*	*369*	*160*	*0*	*41*	*0*
Corn flakes, Kellogg's	*1 oz*	*28.35*	*110*	*0*	*24*	*2*
Corn oil	*1 tbsp*	*14*	*125*	*14*	*0*	*0*
Doughnuts	*1 donut*	*50*	*210*	*12*	*24*	*3*
Eggs, cooked, hard	*1 egg*	*50*	*75*	*5*	*1*	*6*
Flounder, baked	*3 oz*	*85*	*80*	*1*	*0*	*17*
Grape juice	*1 cup*	*253*	*155*	*0*	*38*	*1*
Green beans	*1 cup*	*135*	*35*	*0*	*8*	*2*
Hamburger, regular	*1 sandwh*	*98*	*245*	*11*	*28*	*12*
Honey	*1 tbsp*	*21*	*65*	*0*	*17*	*0*
Hot-dog (frankfurter)	*1 sausage*	*45*	*145*	*13*	*1*	*5*
Ice cream, vanlla	*1 cup*	*133*	*270*	*14*	*32*	*5*
Jam	*1 tbsp*	*20*	*55*	*0*	*14*	*0*
Lentils, cooked	*1 cup*	*200*	*215*	*1*	*38*	*16*
Lettuce	*1 cup*	*56*	*10*	*0*	*2*	*1*
Macaroni, cooked	*1 cup*	*140*	*155*	*1*	*32*	*5*

Food :	Quantity	Wt. (grams)	KCal	Fat (g.)	Carb (g.)	Prot. (g.)
Mayonnaise	*1 tbsp*	*14*	*100*	*11*	*0*	*0*
Milk, low fat,1%	*1 cup*	*244*	*100*	*3*	*12*	*8*
Milk, whole,3.3% fat	*1 cup*	*244*	*150*	*8*	*11*	*8*
Mushrooms	*1 cup*	*70*	*20*	*0*	*3*	*1*
Nectarines	*1 nectrn*	*136*	*65*	*1*	*16*	*1*
Olive oil	*1 tbsp*	*14*	*125*	*14*	*0*	*0*
Oranges	*1 orange*	*131*	*60*	*0*	*15*	*1*
Orange juice	*1 cup*	*248*	*110*	*0*	*26*	*2*
Peach pie	*1 piece*	*158*	*405*	*17*	*60*	*4*
Peanuts	*1 oz*	*28.35*	*165*	*14*	*5*	*8*
Peanut butter	*1 tbsp*	*16*	*95*	*8*	*3*	*5*
Pizza	*1 slice*	*120*	*290*	*9*	*39*	*15*
Plums	*1 plum*	*28*	*15*	*0*	*4*	*0*
Pork, ham	*2.5 oz*	*72*	*160*	*8*	*0*	*20*
Potato, baked	*1 potato*	*202*	*220*	*0*	*51*	*5*
Potato chips	*10 chips*	*20*	*105*	*7*	*10*	*1*
Potatoes, french-fries	*10 fries*	*50*	*160*	*8*	*20*	*2*
Radishes	*4 radish*	*18*	*5*	*0*	*1*	*0*
Rice, white, cooked	*1 cup*	*205*	*225*	*0*	*50*	*4*
Salmon, baked	*3 oz*	*85*	*140*	*5*	*0*	*21*
Sardines, in oil	*3 oz*	*85*	*175*	*9*	*0*	*20*
Spaghetti, cooked	*1 cup*	*140*	*155*	*1*	*32*	*5*
Spinach, cooked	*1 cup*	*180*	*40*	*0*	*7*	*5*
Strawberries	*1 cup*	*149*	*45*	*1*	*10*	*1*
Sugar	*1 tbsp*	*12*	*45*	*0*	*12*	*0*
Swiss cheese	*1 oz*	*28.35*	*105*	*8*	*1*	*8*
Tomato juice	*1 cup*	*244*	*40*	*0*	*10*	*2*
Tomato sauce	*1 cup*	*245*	*75*	*0*	*18*	*3*
Trout, broiled	*3 oz*	*85*	*175*	*9*	*0*	*21*
Tuna, canned in water	*3 oz*	*85*	*135*	*1*	*0*	*30*
Tuna, canned in oil	*3 oz*	*85*	*165*	*7*	*0*	*24*
Turkey roast	*3 oz*	*85*	*130*	*5*	*3*	*18*
Veal	*3 oz*	*85*	*185*	*9*	*0*	*23*
Wheat bread	*1 slice*	*25*	*65*	*1*	*12*	*2*
Wine, red	*3.5 f oz*	*102*	*75*	*0*	*3*	*0*
Yogurt, plain	*8 oz*	*227*	*145*	*4*	*16*	*12*

Source : http://www.ntwrks.com/~mikev/chart1.html

Nutritional disorders : Cholesterol and dyslipidemia

VOCABULARY *in context*. Match the following definitions with words from the reading passage below, then give an appropriate translation in French.

230. *A white crystalline substance, $C_{27}H_{45}OH$, found in animal tissues and various foods, that is normally synthesized by the liver and is important as a constituent of cell membranes and a precursor to steroid hormones. Its level in the bloodstream can influence the pathogenesis of certain conditions, such as the development of atherosclerotic plaque and coronary artery disease. :* _____

231. *A constituent element, a part :* _____

232. *A biochemical substance, such as an intermediate compound in a chain of enzymatic reactions, from which a more stable or definitive product is formed :* _____

233. In a free (unobstructed) manner; without restraint : _____

234. *A form of arteriosclerosis characterized by the deposition of atheromatous plaques containing cholesterol and lipids on the innermost layer of the walls of large and medium-sized arteries. :* _____

235. With the terms of the relation reversed, vice versa : _____

236. *An abnormal concentration of lipids or lipoproteins in the blood. :* _____

237. *Part of a patient's medical history in which questions are asked about the health of members of the immediate family in an attempt to find out whether the patient has hereditary tendencies toward particular diseases :* _____

238. *A narrowing or blockage of the arteries and vessels that provide oxygen and nutrients to the heart. It is caused by atherosclerosis, an accumulation of fatty materials on the inner linings of arteries. The resulting blockage restricts blood flow to the heart. :* _____

239. To provide with something : _____

240. *A systemic form of atherosclerosis producing symptoms in the cardiac, cerebral, and renal vascular systems. The incidence is highest among males with diabetes mellitus. Other risk factors include obesity and stress. Blood flow is restricted by an intraarterial accumulation of soft deposits of lipids and fibrin that harden over time, particularly at bends or bifurcations of the arterial walls. Patients generally are not aware of the changes until the diameter of the arterial lumen has been reduced by half. :* _____

241. *Sudden interruption or insufficiency of the supply of blood to the heart, typically resulting from occlusion or obstruction of a coronary artery and often characterized by severe chest pain. Also called myocardial infarction. :* _____

242. *A sudden loss of brain function caused by a blockage or rupture of a blood vessel to the brain, characterized by loss of muscular control, diminution or loss of sensation or consciousness, dizziness, or slurred speech :* _____

243. *The pattern of lipids in the blood, usually including total cholesterol, high density lipoprotein (hdl) cholesterol, triglycerides, and calculated low density lipoprotein (ldl) cholesterol, used to gauge a person's risk for coronary heart conditions :* _____

244. *A specimen of blood taken from a vein for analysis :* _____

245. *To abstain from food, especially as a religious discipline, or for diagnostic or therapeutic purposes :* _____

246. *To bring down, reduce :* _____

247. *Relating to an organic compound, especially a fatty acid, containing the maximum number of hydrogen atoms and only single bonds between the carbon atoms :* _____

248. The yellow part in the middle of an egg, surrounded by the albumen, that provides food for the developing embryo : _____

249. A dry one-seeded fruit that grows inside a hard shell : _____

250. *Relating to long-chain carbon compounds, especially fatty acids, having two or more double bonds between the carbon atoms, which help reduce blood cholesterol levels :* _____

251. *An organic compound, especially an oil or fatty acid, containing only one double or triple bond per molecule :* _____

252. A food paste made primarily from roasted peanuts : _____

253. Several plants of the genus Helianthus, especially H. annuus, having tall coarse stems and large, yellow-rayed flower heads that produce edible seeds rich in oil. : _____

254. The mature fertilized grain of a plant, containing an embryo ready for germination : _____

255. 1. The small hard seedlike fruit of a cereal plant 2. cereal plants in general : _____

256. Indigestible plant matter with an affinity for water, either dissolving or swelling to form a gel; including gums, pectins, mucilages, and primarily found in fruits, vegetables, oats, barley, beans, and seaweed : _____

257. *To stick together or cause to stick. To combine with, form a bond with, or be taken up by a chemical or chemical structure. :* _____

258. Various grasses of the genus Avena, especially A. sativa, widely cultivated for their edible grains. : _____

259. The outer layers of the grain of cereals such as wheat, removed during the process of milling and used as a source of dietary fiber. : _____

260. A coarse flour made by grinding oats : _____

261. An annual climbing plant (Pisum sativum) with green pods containing green edible seeds : _____

262. A tall grasslike plant with dense bristly flower spikes, widely cultivated for grain and used in making beer and whisky : _____

263. Various evergreen trees or shrubs bearing fruit with juicy flesh and a thick rind, native to southern and southeast Asia but grown in warm climates around the world, including orange, lemon, lime, and grapefruit : _____
264. A sweet fleshy red fruit (genus Fragaria) with small seeds on the outside : _____
265. *A class of lipid-lowering drugs that reduce serum cholesterol levels by inhibiting a key enzyme (HMG-CoA reductase) involved in the biosynthesis of cholesterol. :* _____
266. *A peripheral or secondary effect, especially an undesirable secondary effect of a drug or therapy. :* _____

Cholesterol

Cholesterol and triglycerides are important fats (lipids) in the blood. Cholesterol is an essential component of cell membranes, brain and nerve cells, and bile (which helps the body absorb fats and fat-soluble vitamins) and is an important precursor for various hormones, such as estrogen, testosterone, and cortisol.

Fats, such as cholesterol and triglycerides, cannot circulate freely in the blood, because blood is mostly water. To circulate in blood, cholesterol and triglycerides are packaged with proteins to form different types of lipoprotein particles including chylomicrons, very low density lipoproteins (VLDL), low-density lipoproteins (LDL), and high-density lipoproteins (HDL).

Lipoproteins : Lipid Carriers

Type	Origin	Lipid Content	Function
Chylomicrons	*Formed from fats in food processed by the intestine*	*Mostly triglycerides*	*Transports digested fats (as triglycerides) to muscle and fat cells*
Very low density lipoprotein (VLDL)	*Formed in the liver*	*More than ½ triglycerides* *About 1/4 cholesterol*	*Transports triglycerides from the liver to fat cells*
Low-density lipoprotein (LDL)	*Formed from VLDL after it delivers triglycerides to fat cells*	*More than ½ cholesterol* *Less than 1/10 triglycerides*	*Transports cholesterol to various cells*
High-density lipoprotein (HDL)	*Formed in the liver and small intestine*	*About ¼ cholesterol* *About 1/20 triglycerides*	*Removes cholesterol from tissues in the body and transports it to the liver*

Abnormal levels of lipids (especially cholesterol) can lead to long-term problems, such as atherosclerosis, the formation of plaque on the inside of artery walls. Generally, a high total cholesterol level (which includes LDL, HDL, and VLDL cholesterol) or a high level of LDL (the "bad") cholesterol increases the risk of atherosclerosis. However, not all types of cholesterol increase this risk. A high level of HDL (the "good") cholesterol may decrease risk, and conversely, a low level of HDL cholesterol increases risk.

Dyslipidemia

Dyslipidemia refers to abnormal levels of lipids carried by lipoproteins in the blood. This* term includes hyperlipoproteinemia (hyperlipidemia) — which refers to abnormally high levels of total cholesterol, low density lipoprotein (LDL) cholesterol, or triglycerides — as well as an abnormally low level of high density lipoprotein (HDL) cholesterol.

Factors that increase the risk of dyslipidemia include the following :

- Having close relatives who have had dyslipidemia (a family history of the disorder)
- Being overweight
- Consuming a diet high in saturated fats and cholesterol
- Being physically inactive
- Consuming large amounts of alcohol

Symptoms

High lipid levels in the blood usually cause no symptoms. However, the risk of developing atherosclerosis increases as the total cholesterol level increases. Atherosclerosis can affect the arteries that supply blood to the heart (causing coronary artery disease), those* that supply blood to the brain (causing cerebrovascular disease), and those* that supply the rest of the body (causing peripheral arterial disease). Therefore*, having a high total cholesterol level also increases the risk of having a heart attack or stroke. Indeed, the risk of a heart attack more than doubles when the total cholesterol level approaches 300 mg/dL.

Diagnosis

Levels of total cholesterol, LDL cholesterol, HDL cholesterol, and triglycerides — the lipid profile — are measured in a blood sample. The lipid profile should be measured in all adults 20 years and older, and the measurement should be repeated every 5 years. Because consuming food or beverages may cause

triglyceride levels to increase temporarily, people must fast at least 12 hours before the blood sample is taken.

For adults, a total cholesterol level of less than 200 mg/dL is desirable. The total cholesterol level, however, is only a general guide to the risk of atherosclerosis. Levels of the components of total cholesterol — particularly LDL and HDL cholesterol — are more* important.

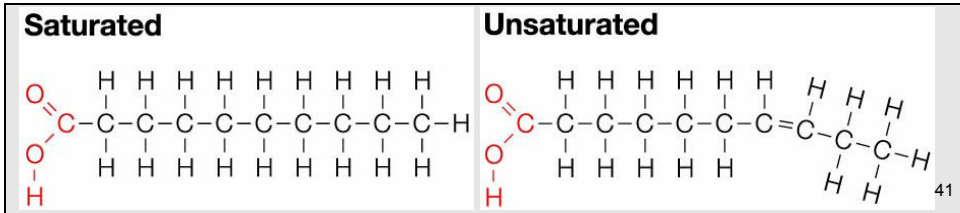
Healthy Lipid Levels in Adults

Lipid	Goal (mg/dL)[40]
Total cholesterol	Less than 200 mg/dL
Low-density lipoprotein (LDL) cholesterol	Less than 100 mg/dL
High-density lipoprotein (HDL) cholesterol	More than 40 mg/dL
Triglycerides	Less than 150 mg/dL

Treatment

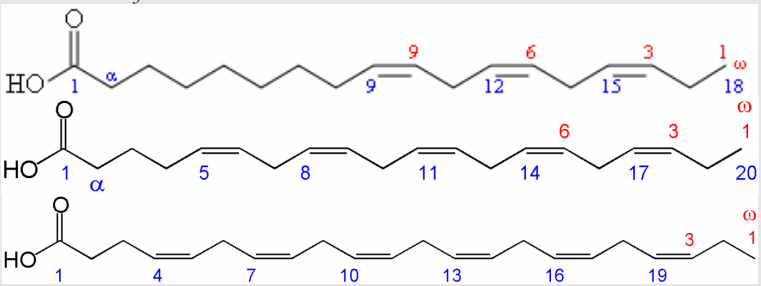
Usually, the best treatment for people is to lose weight if they are overweight, stop smoking if they smoke, decrease the total amount of fat and cholesterol in their diet, increase physical activity, and then, if necessary, take a lipid-lowering drug.

Calories from fat should be limited to no more than 25 to 35% of the total calories consumed. The type of fat consumed — saturated, polyunsaturated, or monounsaturated — is also important. Saturated fats increase cholesterol levels more than other forms of fat and should therefore provide no more than 7 to 10% of total calories consumed each day. Large amounts of saturated fats occur in meats, egg yolks, full-fat dairy products and some nuts. Vegetable oils contain smaller* amounts of saturated fat. Polyunsaturated fats (which include omega-3 and omega-6 fats) and monounsaturated fats may help decrease levels of triglycerides and LDL cholesterol in the blood. Examples of foods which contain polyunsaturated fats include fish, peanut butter, margarine and sunflower seeds.



[41]

Saturated and Unsaturated fatty acids : *Saturated fatty acids have no double bonds between carbon atoms. Unsaturated fatty acids have at least one double bond. Each double bond produces a "bend" in the molecule. Molecules with many of these bends (polyunsaturated) cannot be packed as closely together as straight molecules, so these fats are less dense and remain liquid at lower temperatures. For example, butter contains more saturated fat than canola oil.*[42]



Omega (ω)-3 fatty acids : *Chemical structure of alpha-linolenic acid (ALA), eicosapentaenoic acid (EPA), and docosahexaenoic acid (DHA).* – *Although omega-3 fatty acids have been known as essential to normal growth and health since the 1930s, awareness of their health benefits has dramatically increased in the past few years. The heart-health benefits of the long-chain omega-3 fatty acids — DHA and EPA omega-3 — are the best known. These benefits were discovered in the 1970s by researchers studying the Greenland Eskimos. The Greenland Eskimos consumed large amounts of fat from seafood, but displayed virtually no cardiovascular disease.*[43] *Omega-3 fatty acids are considered essential fatty acids, i.e. they are essential to human health but cannot be manufactured by the body and therefore must be obtained from food, especially fish. Extensive research indicates that omega-3 fatty acids reduce inflammation and help prevent risk factors associated with chronic diseases such as heart disease, cancer, and arthritis. These essential fatty acids are highly concentrated in the brain and appear to be particularly important for cognitive (brain memory and performance) and behavioral function.*[44]

In addition to fruits, vegetables, and grains (which are naturally low in fat and contain no cholesterol) foods rich in soluble fiber, which binds fats in the intestine and helps lower the cholesterol level, are recommended. Such foods include oat

[40] mg/dL = milligrams per deciliter of blood.

[41] Image : http://www.realfitnessblog.com/2008/11/30/dietary-fat-is-not-the-enemy/

[42] http://faculty.clintoncc.suny.edu/faculty/Michael.Gregory/files/Bio%20100/Bio%20100%20Lectures/Biochemistry/biochemi.htm

[43] http://en.wikipedia.org/wiki/Omega-3_fatty_acid

[44] http://www.umm.edu/altmed/articles/omega-3-000316.htm

bran, oatmeal, beans, peas, rice bran, barley, citrus fruits, strawberries, and apple pulp.

There are different types of lipid-lowering drugs : bile acid binders, fibric acid derivatives, niacin (a lipoprotein synthesis inhibitor), cholesterol absorption inhibitors, supplements of omega-3 fats, and statins. Each type lowers lipid levels by a different mechanism. Consequently, different types of drugs have different side effects.

Type	Mechanism of Action	Indications	Side Effects
Bile acid binders	*Bind bile acids in the intestine, causing the acids to be excreted rather than used to make bile and causing the liver to remove more LDL cholesterol from the bloodstream to make bile*	*High LDL cholesterol*	*Abdominal pain* *Binding of other drugs (reducing effectiveness)* *Bloating* *Constipation* *Nausea* *Increase in triglyceride level*
Fibric acid derivatives	*Increase the breakdown of lipids and speed the removal of VLDL from the bloodstream* *May decrease VLDL production by the liver*	*High triglycerides* *Low HDL cholesterol* *Dysbetalipoproteinemia* *Possibly high VLDL cholesterol*	*Abdominal pain* *Bloating* *Diarrhea* *Gallstones* *High liver enzyme levels* *Muscle aches due to inflammation (myositis)* *Nausea* *Rash*
Lipoprotein synthesis inhibitor (Niacin)	*Slows removal of HDL* *Lowers triglyceride levels* *At high doses, decreases production rate of VLDL, which is used to synthesize LDL*	*High triglycerides* *Low HDL cholesterol* *High LDL and VLDL cholesterol* *Dysbetalipoproteinemia*	*Digestive upset* *Flushing* *Gout* *High blood sugar level* *High liver enzyme levels* *Itching* *Ulcers*
Cholesterol absorption inhibitor	*Decreases cholesterol absorption in the small intestine*	*High LDL cholesterol*	*Few serious side effects* *Loose stools* *Muscle aches*
Fat supplements (Omega-3 fatty acids)	*Lower levels of triglycerides* *May decrease production of VLDL*	*High triglycerides*	*Belching* *Diarrhea* *Weight gain if taken in addition to other fats*
Statins (HMG-CoA reductase inhibitors)	*Block the synthesis of cholesterol, increasing the removal of LDL from the bloodstream*	*High LDL cholesterol, triglycerides, or both*	*Bloating* *Constipation (mild)* *Fatigue* *Headache* *Loose stools*

***What do the following words refer to ?**

ll. *"This* term includes"* → "This term" refers to …

mm. *"those* that supply blood to the brain … and those* that supply the rest of the body"* → "Those" refers to …

nn. *"Therefore*, having a high total cholesterol level also increases the risk of having a heart attack or stroke"* → "Therefore" refers to the fact that …

oo. *"particularly LDL and HDL cholesterol — are more* important"* → Levels of LDL and HDL cholesterol are more important than …

pp. *"Vegetable oils contain smaller* amounts of saturated fat"* → "Vegetable oils contain smaller* amounts of saturated fat than …

True or False ? (Be ready to explain and discuss).

xxv. Cholesterol is an essential nutrient in the diet.

xxvi. Atherosclerosis refers to the narrowing and hardening of coronary arteries caused by deposits of fats and cholesterol.

xxvii. Healthy diets are high in omega-3 and omega-6 polyunsaturated fats.

xxviii. Soluble fibers prevent fats from being absorbed.

Questions : (1) Ask questions about the following points, then (2) let someone else answer in a complete sentence (3) using as many of the suggested terms as possible.

HOW (×2) – WHAT (×3)

25. *Physiological usefulness* and *pathological risk(s)* of cholesterol in the organism. → …

normally – cells – and – synthesis – abnormally – blood – accumulate – causing

Although cholesterol …

26. *The make up of* the "lipid profile". *Healthy* levels of cholesterol and lipids. → …

consists – measurements – to ensure – representative – hours – before – sample

The lipid profile …

27. *Dietary recommendations for* patients with dyslipidemia. → …

limit – total – maximum – especially – Furthermore – fiber – such as – helps – by – and thus – absorption

It is important …

28. Make up one original question of your own relating to this section of the article, and write a 2-3 line answer to it using information either from the article or from outside sources.

Nutritional disorders : Metabolic syndrome

VOCABULARY *in context*. Match the following definitions with words from the reading passage below, then give an appropriate translation in French.

267. *A combination of risk factors for heart disease, diabetes, and stroke. It includes abdominal obesity, high blood pressure, high blood glucose levels, and low levels of high-density lipoprotein (HDL) cholesterol (sometimes called insulin resistance syndrome) :* _____

268. More than normal or necessary : _____

269. *A common disorder in which blood pressure remains abnormally high (140/90 mm Hg or greater) :* _____

270. To a small degree or extent : _____

271. *A standard, rule, or test on which a judgment or decision can be based ; a basis for comparison; a reference point against which other things can be evaluated :* _____

272. *The capacity of an organ or organism to respond to stimulation. :* _____

273. An oral antidiabetic agent, C4H11N5, that decreases glucose production by the liver and lowers plasma glucose levels. : _____

274. A class of oral antidiabetic agents that inhibit tyrosine kinase, decrease insulin resistance and correct hyperglycemia, hyperinsulinemia, hypertriglyceridemia : _____

275. 1. To provide (someone) with the means or opportunity to do something, to render capable or able for some task 2. to make possible : _____

276. Producing effectively with a minimum of waste, expense, or unnecessary effort : _____

277. *A characteristic, condition, or behavior that increases the possibility of disease or injury :* _____

278. *A point of articulation between two or more bones, especially such a connection that allows motion. :* _____

279. *A digit of the foot. :* _____

280. Occurring every day : _____

281. *The act or process of identifying or determining the nature and cause of a disease or injury through evaluation of patient history, examination, and review of laboratory data. The opinion derived from such an evaluation. :* _____

282. *A temporary suspension of breathing occurring repeatedly during sleep that often affects overweight people or those having an obstruction in the breathing tract, an abnormally small throat opening, or a neurological disorder. :* _____

283. A disturbance of uric-acid metabolism occurring chiefly in males, characterized by painful inflammation of the joints, especially of the feet and hands, and arthritic attacks resulting from elevated levels of uric acid in the blood and the deposition of urate crystals around the joints. : _____

284. The process of remembering (especially the process of recovering information by mental effort) : _____

285. *The act of taking in. The quantity of something, especially energy, taken in. :* _____

286. The reason for which anything is done, created, or exists. A result or effect that is intended or desired; an intention, syn. goal, objective : _____

287. *The act, manner, or practice of handling, supervision, or control :* _____

288. *1. A person licensed to practice medicine; a medical doctor. 2. A person who practices general medicine as distinct from surgery. :* _____

289. 1. A small open container, usually with a flat bottom and a handle, used for drinking. 2. A unit of volume equal to 8 fluid ounces (237 milliliters) : _____

290. *An instrument or machine for weighing. (Often used in the plural) :* _____

291. The single complete movement of raising one foot and putting it down in another spot, as in walking. : _____

292. To set down for preservation in writing or other permanent form. : _____

293. 1. A single thing in a list or collection 2. A piece of information : _____

294. A subsequent examination of a patient for the purpose of monitoring earlier treatment : _____

295. *A mutually agreed-on time reserved for the patient to receive treatment. :* _____

296. *The suite of rooms where a physician receives and treats patients, and otherwise practices medicine (known in the UK as 'doctor's surgery') :* _____

297. *To do or have a medium number of :* _____

298. With careful and persevering effort : _____

299. Requiring great effort, energy, or exertion. Vigorously active; energetic : _____

300. *A reference point used to indicate the initial condition against which future measurements are compared. :* _____

301. An artificial food designed to replace one or two meals as part of a calorie controlled diet. Most are made from sugar and milk, and contain a filler or bulking agent (e.g. plant fibre or guar gum) which helps a person to feel full, as well as vitamins and minerals : _____

302. To restrain, or control as if with a curb (a concrete border along the edge of a street) : _____

303. A physiological need for food. A feeling of emptiness caused by lack of food : _____

304. *The presence of one or more disorders (or diseases) in addition to a primary disease or disorder; or the effect of such additional disorders or diseases. :* _____

305. *An annual women's health exam including a general health history, a sexual health history and an evaluation of the thyroid, skin, heart, lungs, breast, abdomen and pelvis :* _____

306. *A screening test, especially for cervical cancer, in which a smear of cells scraped from the cervix or vagina is treated with a chemical stain and examined under a microscope for pathological changes. : _____*

307. *To direct to a source for help or information. The recommendation to consult another health professional for a specified reason. : _____*

Metabolic syndrome

Metabolic syndrome is characterized by excess abdominal fat, resistance to the effects of insulin, abnormal levels of fats in the blood (dyslipidemia), and high blood pressure.

In developed countries, metabolic syndrome is a serious problem. In the United States, some studies estimate the prevalence to be up to 25% of the population, including more than 40% of people over 50. Even children and adolescents can develop metabolic syndrome, but how many have it* is unknown[45].

As is true with many medical conditions, genetics and the environment both influence individual components of the syndrome, and the syndrome itself. A family history that includes diabetes, hypertension, and heart disease greatly increases the chance that an individual will develop metabolic syndrome. Environmental factors such as sedentary lifestyle, and progressive weight gain also contribute significantly[46]. Metabolic syndrome is more likely to develop when people store excess fat around the abdomen as* occurs in most men, and women after menopause. Accumulation of excess abdominal fat increases the risk of the following health problems :

- Type 2 diabetes
- Coronary artery disease
- Fatty liver
- Chronic kidney disease
- Polycystic ovary syndrome (in women)

Diagnosis

Waist circumference should be measured in all people because even people who do not appear to be overweight can store excess fat in the abdomen. The greater the waist circumference, the higher[47] the risk of metabolic syndrome. Although several definitions* with slightly different criteria* are currently in use, metabolic syndrome is generally diagnosed when the waist circumference is more than 37–40 inches (94–102 cm) in men or more than 31–36 inches (80–88 cm) in women and when people have or are being treated for two or more of the following conditions :

- A fasting blood sugar level of more than 100 mg/dL
- Blood pressure of more than 130/80 mm Hg
- A fasting blood triglyceride (fat) level of more than 150 mg/dL
- A high density lipoprotein (HDL — the good) cholesterol level of 40 mg/dL or less for men or 50 mg/dL or less for women

In general, a person with metabolic syndrome is twice as likely to develop heart disease and five times as likely to develop diabetes as someone without metabolic syndrome. The more risk factors are present, the greater the chance of developing heart disease, diabetes, or stroke[48]. According to one extensive study, patients with four features of metabolic syndrome had almost four times the risk of heart disease and were about 25 times more likely to develop diabetes[49].

[45] *On the basis of NHANES 1999–02 data, the prevalence of the MetS in adolescents ages 12–19 years was 9.4 percent, representing about 2.9 million persons. It was 13.2 percent in males, 5.3 percent in females.* (*J Pediatr.* 2008;152:165-70.)

[46] http://www.webmd.com/heart-disease/guide/metabolic-syndrome?page=2

[47] NB. Lorsque deux constructions comparatives antéposées (en début de phrase ou de proposition) et précédées de l'article défini THE se suivent (p.ex. : *the more I wait, the hungrier I get = plus j'attends, plus j'ai faim*), elles expriment une corrélation : *The greater the waist circumference, the higher the risk of metabolic syndrome* = When the waist circumference is greater, the risk of metabolic syndrome is higher *(Plus le tour de taille est important, et plus le risque de syndrome métabolique est élevé).*

[48] http://www.nhlbi.nih.gov/health/dci/Diseases/ms/ms_whatis.html ; http://www.idf.org/metabolic-syndrome

[49] http://diabetes.webmd.com/news/20030714/higher-risk-for-diabetes-heart-disease

Current definitions of MetS :

IDF[50] criteria :	**NHLBI-AHA[51] critera :**
According to the new IDF definition, a person must have : • *Central obesity (defined as waist circumference ≥ 94cm for men and ≥ 80cm for women).* plus any two of the following four factors : • *raised TG level: ≥ 150 mg/dL (or specific treatment for this lipid abnormality).* • *reduced HDL : < 40 mg/dL in males and < 50 mg/dL in females (or specific treatment).* • *raised blood pressure: systolic BP ≥ 130 or diastolic BP ≥ 85 mm Hg (or treatment of previously diagnosed HTN).* • *raised fasting plasma glucose ≥ 100 mg/dL, or previously diagnosed type 2 diabetes.*	Under current (2005) guidelines, metabolic syndrome is diagnosed when a patient has at least 3 of the following 5 conditions : • *Fasting glucose ≥ 100 mg/dL (or receiving drug therapy for hyperglycemia)* • *Blood pressure ≥ 130/85 mm Hg (or receiving drug therapy for HTN)* • *Triglycerides ≥ 150 mg/dL (or drug therapy for hypertriglyceridemia)* • *HDL-C < 40 mg/dL in men or < 50 mg/dL in women (or receiving drug therapy for reduced HDL-C)* • *Waist circumference ≥ 102 cm (40 in) in men or ≥ 88 cm (35 in) in women.*

Treatment

The initial treatment involves changes in diet and exercise. Each part* of the syndrome should also be treated with drugs if necessary. Drugs to lower blood pressure (antihypertensives), drugs to lower lipid levels or drugs that increase the body's sensitivity to insulin, such as metformin or thiazolidinedione, may help. Also, exercise is important for people with diabetes because it* enables the body to use blood sugar more efficiently[52] and can often help lower the blood sugar level. Other risk factors for coronary artery disease should be controlled. For example, smokers are advised to stop smoking.

Case History 1

"Mike" is a 58-year-old man who is 5 ft 9 in (1.75 m) tall and weighs 232 lb (105 kg). His body mass index (BMI) is 34 kg/m2 and waist circumference is 46 in (117 cm). He presents to the obesity clinic with intense joint pain in the big toe, trouble sleeping and breathing, shortness of breath after walking even short distances, and low energy levels. His blood pressure is 120/70 mm Hg; his heart rate is 70 beats/minute; and his current medications include aspirin 325 mg once daily, metoprolol (a selective β1 receptor blocker) 50 mg twice daily, and atorvastatin (an HMG-CoA reductase inhibitor[53]) 10-20 mg once daily.

Recent laboratory studies reveal a triglyceride level of 377 mg/dL; high-density lipoprotein (HDL), 41-51 mg/dL, total cholesterol, 167-200 mg/dL; low-density lipoprotein (LDL), 50-93 mg/dL; and uric acid, 7.3-8.4 mg/dL.[54]

Mike's current diagnoses include atherosclerotic cardiovascular disease, dyslipidemia, sleep apnea, and gout. His foot pain is in remission due to an anti-inflammatory agent. Using a food history recall, Mike's caloric intake is estimated at 3000 kcal/day. The purpose of Mike's visit is weight management to improve his health and reduce his need for medications.

Mike's physician writes out a realistic exercise and eating plan. More specifically, Mike is encouraged to try eating a small breakfast of whole grains and/or lean protein, add 2 cups of salad to his lunch, follow his weight daily with a bathroom scale, use a pedometer to count his steps, and record all these* items in a journal. A telephone follow-up is scheduled for 1 week after this appointment, and the next office visit for 1 week after that*. Communication via email is also initiated.

Mike averages 7000 steps per day (about 3 miles) and reports eating roughly 1700 calories daily. He has worked diligently to readjust his eating habits through stimulus control, and is participating in a strenuous exercise program. He no longer requires medication for gout and his lipid profile is much improved, with normal triglycerides and higher HDL cholesterol levels. Mike reaches a low weight of 210 lb (-10% of baseline weight) at around 6 months. Unfortunately, this* time period

[50] International Diabetes Federation (IDF)

[51] National Heart, Lung, and Blood Institute (NHLBI) and the American Heart Association (AHA)

[52] NB. Les deux adjectifs "*efficient*" et "*effective*" se traduisent par "efficace" en français. Quoique complémentaires, ils ne sont pas tout à fait synonymes en anglais : "*efficient*" insiste sur l'adéquation des moyens mis en œuvre (sans gaspillage, en moins de temps, à moindre coût etc.), "*effective*" insiste sur le résultat (autres traductions possibles : puissant, actif, performant, etc.)

[53]

Type	***Mechanism of Action***	***Indications***	***Side Effects***
Statins (HMG-CoA reductase inhibitors)	*Block the synthesis of cholesterol, increasing the removal of LDL from the bloodstream*	*High LDL cholesterol, triglycerides, or both*	*Bloating* *Constipation (mild)* *Fatigue* *Headache* *Loose stools*

[54] **Desirable Lipid Levels in Adults**

Lipid	**Goal (mg/dL)**
Total cholesterol	*Less than 200 mg/dL*
Low-density lipoprotein (LDL) cholesterol	*Less than 100 mg/dL*
High-density lipoprotein (HDL) cholesterol	*More than 40 mg/dL*
Triglycerides	*Less than 150 mg/dL*

also coincides with the holidays and winter weather. Mike reports difficulties walking even 3000 steps a day. His weight rises to 220 lb.

Mike is advised to try a liquid meal replacement in the afternoon to curb his hunger before dinner. This* method works well and Mike has been able to maintain a 12-lb (5%) weight loss for more than 2 years. More important, he has reduced his waist circumference by 4 in (10 cm) and reversed his comorbidities and medication requirements. This* is the longest that he has maintained a reduced weight in his adult life. During this* time period, he has received 10 office visits, 20 emails, and 4 follow-up phone calls.

Case History 2

Mrs. Y is a 46-year-old married, premenopausal, sedentary white woman who presents for her annual well-woman examination. She is asymptomatic, she takes no medications, and she has no significant family history other than type 2 diabetes. Both her father and her paternal uncle have type 2 diabetes that is controlled by diet and oral medications. Her maternal grandmother had a stroke at the age of 77.

Her last well-woman examination was 1 year ago. At that time, her blood pressure was 130/80 mm Hg, her body measurement index (BMI) was 29 kg/m², and her waist circumference was 79 cm. Her breast examination, Pap smear, and mammogram were all normal. Her last lipid panel was taken 2 years ago and showed the following results :

- total serum cholesterol, 195 mg/dL
- high-density lipoprotein-cholesterol (HDL-C), 50 mg/dL
- low-density lipoprotein-cholesterol (LDL-C), 120 mg/dL
- triglyceride level, 120 mg/dL.

At this visit, her blood pressure has increased to 135/90 mm Hg, and her waist circumference is 84 cm. Her lipid panel shows the following results :

- total cholesterol, 220 mg/dL
- HDL-C, 50 mg/dL
- LDL-C, 130 mg/dL
- triglyceride level, 155 mg/dL.

Fasting glucose is 110 mg/dL.

Mr.s Y's physician diagnoses her with metabolic syndrome and discusses the risks with her. Mrs. Y is referred to a dietician/educator for intensive lifestyle modification and weight reduction. Over a period of months, she is able to sustain a Mediterranean diet consisting of fresh vegetables and fruit, olive oil, yogurt, moderate amounts of fish, poultry and eggs, and an occasional glass of wine, as well as weekly sessions of up to 100 minutes of aerobic exercise or walking. On a subsequent visit, she is started on metformin[55] (an oral anti-diabetic).

Two years after the initial diagnosis of metabolic syndrome, the patient has reduced her BMI to 26 kg/m², and blood pressure to 125/80 mm Hg. Her fasting glucose is now in the range of 95 to 100 mg/dL. Administration of a statin is considered, however, because Mrs. Y has a persistent LDL-C level of 130 mg/dL.

***What do the following words refer to ?**

qq. *"how many* have it* is unknown"* → "How many" refers to …
rr. *"how many* have it* is unknown"* → "It" refers to …
ss. *"as* occurs in most men, and women after menopause"* → "As" refers to the fact that …

tt. *"Although several definitions* with slightly different criteria* are currently in use"* → Currently doctors use slightly different definitions and criteria …
uu. *"Each part* of the syndrome should also be treated"* → The parts of the syndrome are …

vv. *"it* enables the body to use blood sugar more efficiently"* → "It" refers to …
ww. *"and record all these* items in a journal"* → "These items" refers to …

xx. *"the next office visit for 1 week after that*"* → "That" refers to …

yy. *"Unfortunately, this* time period also coincides with the holidays"* → "This time period" refers to …
zz. *"This* method works well"* → "This method" means using …

aaa. *"This* is the longest that he has maintained a reduced weight"* → "This" refers to …

bbb. *"During this* time period"* → "This time period" refers to …

[55] *The biguanide class of anti-diabetic drugs originates from the Goat's rue plant, a.k.a. French lilac (Galega officinalis), a plant known for several centuries to reduce the symptoms of diabetes mellitus. Metformin was first described in the scientific literature in 1957 and was first marketed in France in 1979, but did not receive approval by the U.S. Food and Drug Administration (FDA) for Type 2 diabetes until 1994. It is now the most popular anti-diabetic drug in the United States and one of the most prescribed drugs in the country overall. Metformin improves hyperglycemia primarily through its suppression of hepatic glucose production (hepatic gluconeogenesis). In addition to suppressing hepatic glucose production, metformin increases insulin sensitivity, enhances peripheral glucose uptake, increases fatty acid oxidation, and decreases absorption of glucose from the gastrointestinal tract.*

Galega officinalis

True or False ? (Be ready to explain and discuss).

xxix. Waist circumference is the most important risk factor for metabolic syndrome.

xxx. Metabolic syndrome is diagnosed when patients suffer from abdominal obesity and dyslipidemia.

xxxi. Metabolic syndrome is primarily a cardiovascular disorder.

xxxii. Each of the different disorders which comprise metabolic syndrome requires a different treatment.

Questions : (1) Ask questions about the following points, then (2) let someone else answer in a complete sentence (3) using as many of the suggested terms as possible.

WHICH – WHAT (×4)– HOW MANY (×2) – HOW (×2)

29. Patients at risk of developing metabolic syndrome. → …

old – progressively – around – likely to – especially – predisposition – as evidenced by[56] – family

People over …

30. *The features* metabolic syndrome*. The number of* criteria *required to* diagnose metabolic syndrome. → …

measurement of – indication – abdominal – and – combination of

The diagnosis …

31. The risks associated with metabolic syndrome. *The quantitative relationship between* the risk of morbidity and the number of risk factors. → …

and – diabetes – according to – factors – Indeed, – incidence of – already – higher – in general – exponentially – when – four – Similarly, – doubles – and quadruples – when

The risks of …

32. Methods *of developing awareness and responsibility in patients like* Mike.→ …

recommendations – such as – scale – and – and – journal of – in order to – make – and – responsible

Mike's doctor …

33. *The long-term successfulness of* Mike's weight loss and management program. → …

eventually[57] – weight – lost – but – program – nonetheless – insofar as – maintain – years – circumference – profile – and – medication

Like most patients …

34. *The number of* risk factors that Mrs. Y presented. *Their identification.* → …

features – i.e. – circumference – pressure – sugar – and – Moreover – significant

Mrs. Y presented …

[56] NB. "*as evidenced by*" ⇒ comme le montre…, comme l'indique…

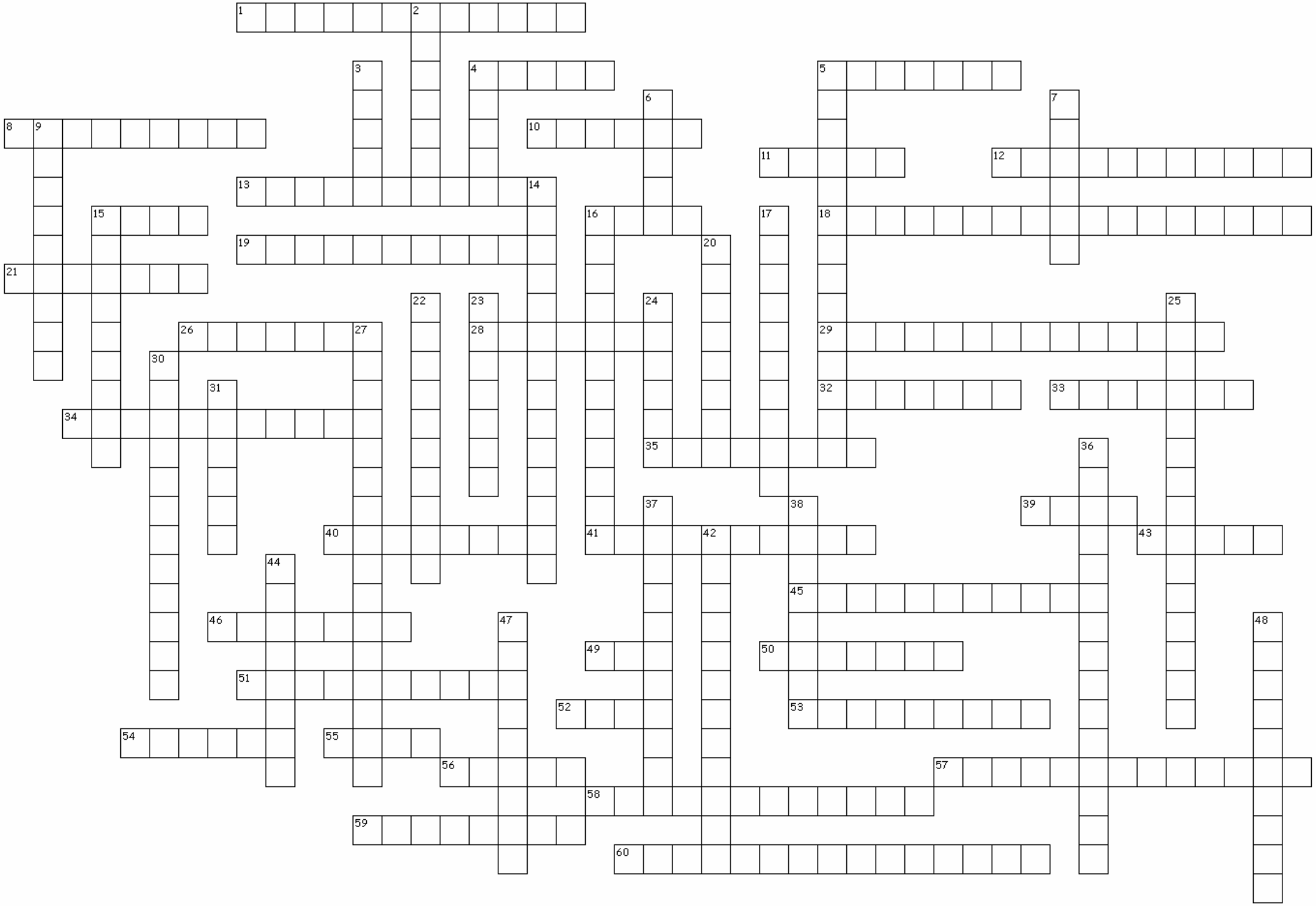
[57] NB. "*Eventually*" ne signifie ni "éventuellement" ni "finalement". Il exprime un moment ultérieur indéterminé (syn. *in the long run, sooner or later, some day*). On le traduit en français par les expressions "*avec le temps*", "*tôt ou tard*", ou encore "*il finira/a bien fini par*…".

35. *The treatments for* Mrs. Y's different risk factors and their outcome (result). → …

able – weight – and – pressure – without – thanks to – and – but – also – necessary to – sugar – and

Mrs. Y …

36. Make up one original question of your own relating to this section of the article, and write a 2-3 line answer to it using information either from the article or from outside sources.



Across

1. Colorless, watery, acidic digestive fluid that is secreted by various glands in the mucous membrane of the stomach and consists chiefly of hydrochloric acid, pepsin, rennin, and mucin

4. To reserve; stock; To deposit

5. A sound generated during sleep by vibration of loose tissue in the upper airway

8. Relating to an organic compound, especially a fatty acid, containing the maximum number of hydrogen atoms and only single bonds between the carbon atoms

10. 1. The force with which a body is attracted to Earth and which is equal to the product of the object's mass and the acceleration of gravity. 2. A measure of the heaviness of an object.

11. The longest part of the large intestine, extending from the cecum to the rectum. Water and electrolytes are absorbed, solidified, and prepared for elimination as feces. It also contains bacteria that help in the body's absorption of nutrients from digested material.

12. A specimen of blood taken from a vein for analysis

13. A white crystalline substance, C27H45OH, found in animal tissues and various foods, that is normally synthesized by the liver and is important as a constituent of cell membranes and a precursor to steroid hormones. Its level in the bloodstream can influence the pathogenesis of certain conditions, such as the development of atherosclerotic plaque and coronary artery disease.

15. Material, usually of plant or animal origin, that contains or consists of essential body nutrients, such as carbohydrates, fats, proteins, vitamins, or minerals, and is ingested and assimilated by an organism to produce energy, stimulate growth, and maintain life; nourishment

16. To bite and grind with the teeth; masticate

18. A protein having a ratio of essential amino acids different from that of the average body protein.

19. A small, pear-shaped muscular sac, located under the right lobe of the liver, in which bile secreted by the liver is stored until needed by the body for digestion

21. Abstinence from food and drink. A period of such abstention

26. The enlarged, saclike portion of the alimentary canal, one of the principal organs of digestion, located between the esophagus and the small intestine

28. A type of connective tissue that contains stored cellular fat

29. A muscle that is connected at either or both extremities with a bone and consists of elongated, multinucleated, transversely striated, skeletal muscle fibers, together with connective tissues, blood vessels, and nerves

32. A polypeptide hormone that is secreted by the islets of Langerhans, helps regulate the metabolism of carbohydrates and fats, especially the conversion of glucose to glycogen, and promotes protein synthesis and the formation and storage of neutral lipids.

33. A monosaccharide sugar, C6H12O6. It is the principal circulating sugar in the blood and the major energy source of the body

34. A carbohydrate that cannot be decomposed by hydrolysis, especially one of the hexoses, having the general formula C6H12O6; a monosaccharide

35. Symbol N A nonmetallic element that constitutes nearly four fifths of the air by volume, occurring as a colorless, odorless, almost inert diatomic gas, N2, in various minerals and in all proteins. Atomic number 7; atomic weight 14

39. A bitter, alkaline, brownish-yellow or greenish-yellow fluid that is secreted by the liver, stored in the gallbladder, and discharged into the duodenum and aids in the emulsification, digestion, and absorption of fats. Also called gall

40. A polypeptide hormone secreted by alpha cells in the pancreas that initiates a rise in blood sugar levels by stimulating the breakdown of glycogen by the liver.

41. After a long time, finally, in the end

43. The part of the human trunk between the bottom of the rib cage and the pelvis.

45. One of the microscopic particles of fat occurring in chyle and in the blood, especially after a meal high in fat.

46. A form of amylase in the saliva of human beings and some animals that catalyzes the hydrolysis of starch into maltose and dextrin

49. A class of neutral lipids consisting of various triglycerides; Mixtures of solid or semisolid triglycerides. Numerous compounds of carbon, hydrogen, and oxygen that are glycerides of fatty acids, […] are a major class of energy-rich food, and are soluble in organic solvents (as ether) but not in water.

50. A group of complex organic macromolecules that contain carbon, hydrogen, oxygen, nitrogen, and usually sulfur and are composed of one or more chains of amino acids. They are fundamental components of all living cells and include many substances, such as enzymes, hormones, and antibodies, that are necessary for the proper functioning of an organism. They are essential for the growth and repair of tissue and can be obtained from foods such as meat, fish, eggs, milk, and legumes

51. A vein that conducts blood from the digestive organs, spleen, pancreas, and gallbladder to the liver.

52. The food served and eaten at one time

53. A set of attitudes, habits, and possessions regarded as typical of a particular group or an individual

54. Proteins functioning as biochemical catalysts

55. 1. The usual food and drink of a person. 2. A regulated selection of foods, as for medical reasons or cosmetic weight loss.

56. To be the source of. To produce; specif., a) to give or furnish as a natural process or as the result of cultivation b) to give in return; produce as a result

57. A measurement of the relative percentages of fat and muscle mass in the human body, in which mass in kilograms is divided by height in meters squared and the result used as an index of obesity.

58. An abnormal concentration of lipids or lipoproteins in the blood.

59. The actions or reactions of a person in response to external or internal stimuli.

60. A form of arteriosclerosis characterized by the deposition of atheromatous plaques containing cholesterol and lipids on the innermost layer of the walls of large and medium-sized arteries.

Down

2. To change (something) into another form, substance, state, etc.; transform

3. An instrument or machine for weighing.

4. A class of water-soluble crystalline carbohydrates, including sucrose and lactose, having a characteristically sweet taste and classified as monosaccharides, disaccharides, and trisaccharides

5. The narrow, winding, upper part of the intestine where digestion is completed and nutrients are absorbed by the blood. It extends from the pylorus to the cecum and consists of the duodenum, the jejunum, and the ileum

6. The thick semifluid mass of partly digested food that is passed from the stomach to the duodenum

7. Development; An increase in size, number, or strength

9. An organic compound containing both an NH2 group and a carboxylic acid group (COOH), especially any of the 20 compounds that have the basic formula NH2CHRCOOH, and that link together by peptide bonds to form proteins

14. The portion of the intestine that extends from the ileum to the anus, forming an arch and including the cecum, colon, rectum, and anal canal

15. 1. A large group of monobasic acids, especially those found in animal and vegetable fats and oils, having the general formula CnH2n+1COOH

16. 2. A group of organic compounds that includes sugars, starches, celluloses, and gums and serves as a major energy source in the diet. These compounds contain only carbon, hydrogen, and oxygen, usually in the ratio 1 :2 :1.

17. A state of extreme hunger resulting from lack of essential nutrients over a prolonged period

20. A source of nourishment, especially an ingredient in a food.

22. A peripheral or secondary effect, especially an undesirable secondary effect of a drug or therapy.

23. Numerous minute intestinal lymph-carrying vessels that convey chyle from the intestine to lymphatic circulation and thereby to the thoracic duct

24. A digestive enzyme found in gastric juice that catalyzes the breakdown of protein to peptide

25. 1. Sugar in the form of glucose in the blood. 2. The concentration of glucose in the blood, measured in milligrams of glucose per 100 milliliters of blood.

27. A clear, colorless, fuming, poisonous, highly acidic aqueous solution of hydrogen chloride, HCl, found in the stomach in dilute form

30. The pattern of lipids in the blood, usually including total cholesterol, high density lipoprotein (hdl) cholesterol, triglycerides, and calculated low density lipoprotein (ldl) cholesterol, used to gauge a person's risk for coronary heart conditions

31. An intermediate product of the metabolism of fatty acids. They tend to accumulate in the blood and urine of individuals affected by starvation or uncontrolled diabetes mellitus.

36. Relating to long-chain carbon compounds, especially fatty acids, having two or more double bonds between the carbon atoms, which help reduce blood cholesterol levels

37. The wavelike muscular contractions of the alimentary canal by which contents are forced onward (forward)

38. A syrupy, sweet, colorless or yellowish liquid, C3H8O3, obtained from fats and oils and used as a solvent, an antifreeze, a plasticizer, and a sweetener

42. A naturally occurring ester of three fatty acids and glycerol that is the chief constituent of fats and oils.

44. A polysaccharide, (C6H10O5)n, that is the main form of carbohydrate storage and occurs primarily in the liver and muscle tissue. It is readily converted to glucose as needed by the body to satisfy its energy needs

47. The formation of a chemical compound through the combination of simpler compounds or elements

48. 1 more than normal in body weight after adjustment for height, body build, and age, or 10% to 20% above the person's "desirable" body weight. 2 a body mass index between 25.0 and 29.9.

- *absorb / absorber*
- *accountability / la responsabilité, la responsabilisation*
- *adipose tissue / le tissu adipeux*
- *albumin / l'albumine (f.)*
- *alcohol, Abbr. : ETOH / l'alcool*
- *alkaline / un alcalin*
- *amino acid / un acide aminé*
- *amount / une quantité*
- *appointment / un rendez-vous, une visite médicale, une consultation*
- *as long as / tant que*
- *aspirin / l'aspirine*
- *atherosclerosis / l'athérosclérose (f.)*
- *ATP / l'ATP (adénosine triphosphate)*
- *availability / la disponibilité*
- *available / disponible*
- *average / faire une moyenne de…*
- *back / le dos*
- *bariatric / (chirurgie) bariatrique, contre l'obésité*
- *barley / l'orge (f.)*
- *baseline / initial, de référence*
- *bean / un haricot, une fève*
- *behavior / le comportement*
- *beverage / une boisson (sucrée, alcolisée, etc.)*
- *bile / la bile*
- *bind (bind/ bound/ bound) / (se) lier, fixer*
- *blood sample / une prise de sang, un prélèvement sanguin*
- *blood sugar (concentration / level) / la glycémie, taux de glucose*
- *bloodstream / le système sanguin*
- *body / le corps*
- *body mass index (BMI) / indice de masse corporelle (IMC)*
- *bowel / l'intestin (cf. "boyau")*
- *bowel movement / la défécation*
- *brain / le cerveau*
- *bran / le son (d'avoine, de blé etc.)*
- *break / casser, briser*
- *break down into / décomposer*
- *burn / brûler, consommer*
- *caffeine / la caféine*
- *capillary / un capillaire*
- *carbohydrate / un glucide (un hydrate de carbone)*
- *cardiac orifice / le cardia*
- *catalyze / catalyser*
- *chew / mastiquer, mâcher*
- *cholesterol / le cholestérol*
- *churn / brasser, remuer ("baratter")*
- *chyle / le chyle*
- *chylomicron [kaIloU-] / un chylomicron [$ilo-]*
- *chyme [kaim] / le chyme (Bouillie formée par la masse alimentaire au moment où elle passe dans l'intestin après avoir subi l'action de la salive et du suc gastrique)*
- *citrus / les agrumes*
- *colon / le côlon*
- *comorbidity / la comorbidité*
- *complete protein / une protéine complète*
- *component / un composant*
- *contraction / une contraction*
- *convenience (food, etc.) / prêt à consommer, (plat) cuisiné (cf. convenience store = une supérette)*
- *conversely / inversement, à l'inverse*
- *convert (into) / convertir (en)*
- *corn (US) / le maïs*
- *coronary artery disease / l'arteriosclérose coronaire; l'arteriosclérose coronarienne*
- *counter-signal / un signal inverse, un signal de contre-régulation*
- *criterion (sing.) criteria (pl.) / un critère*
- *crush / écraser*
- *cup / une tasse, un verre*
- *curb / refréner, restreindre (curb = le rebord)*
- *daily (abbr. : qd Lat. "quaque die") / par jour, quotidiennement*
- *dairy / laitier*
- *destine for / destiner à*
- *diagnosis (sing.) diagnoses (pl.) / un diagnostic*
- *diet / 1. l'alimentation, 2. un régime*
- *dietary / alimentaire*
- *digestion / la digestion*
- *diligently / assidûment*
- *disorder / un trouble, une maladie*
- *duodenum / le duodénum*
- *dyslipidemia / la dyslipidémie*
- *efficient(ly) / efficacement*
- *either… or… / ou bien… ou bien…*
- *elevator / un ascenseur*
- *empty (of) / vide (de)*
- *emulsify / émulsionner, émulsifier*
- *en plus / further*
- *enable / permettre, rendre capable (NB. ne pas confondre l'adjectif "able" = capable et son antonyme "unable" = incapable, avec le verbe "enable" = permettre, rendre capable)*
- *engineered) away / éliminer, faire disparaître*
- *enzymatic action / l'action enzymatique, des enzymes*
- *enzyme / un(e) enzyme*
- *essential / essentiel, indispensable*
- *eventually / plus tard, tôt ou tard, ultérieurement, NB. "Eventually" n'est pas seulement un faux ami (ce serait un faux sens de traduire par "éventuellement"), cet adverbe ne correspond pas systématiquement non plus à "finalement", même si cette traduction est indiquée dans les dictionnaires.*
- *excess / en trop*
- *excess / en trop, excédentaire*
- *excrete / excréter*
- *f(a)eces / les fèces*
- *fad / une mode, (qqch) en voque*
- *fall / (re)tomber, chuter*
- *family history / les antécédents familiaux*
- *fast / jeûner, rester à jeun*
- *fast(ing) / le jeûne, à jeun*
- *fat / un lipide, une matière grasse, la graisse*
- *fatty acid / un acide gras*
- *fish / le poisson*
- *follow-up / une visite de contrôle, de suivi*
- *food / la nourriture, un aliment*
- *freely / librement*
- *fructose / le fructose*
- *fuel / source d'énergie, combustible, (un "carburant")*
- *gain (weight) / prendre du poids*
- *galactose / le galactose*
- *gall bladder / la vésicule biliaire*
- *gastric juice / les sucs gastriques*
- *global / mondial, planétaire (NB. le sens de l'adjectif français "global" correspond plutôt à "general, overall" en anglais)*
- *globule / un globule*
- *glucagon / le glucagon*
- *glucose / le glucose*
- *glycerol / le glycérol*
- *glycogen / le glycogène*
- *goal / un but, un objectif*
- *gout / la goutte*
- *grains / les céréales*
- *growth / la croissance (NB. croître, grandir = to grow, grew, grown)*
- *gut / les intestins*
- *hair-like / comme un cheveu, filiforme*
- *heart attack / une crise cardiaque, un infarctus du myocarde*
- *heart muscle / le muscle cardiaque*
- *height / la taille, la grandeur*
- *high blood pressure (HTN) / l'hypertension artérielle*
- *hip / la hanche*
- *hunger / la faim*
- *hydrochloric acid / l'acide chlorhydrique*
- *in many respects / à bien des égards*
- *including / y compris, dont entre autres...*
- *incomplete protein / une protéine imcomplète*
- *increase IN / une augmentation de…*
- *increasing / croissant, en augmentation*
- *increasingly / de plus en plus*
- *inner / interne, intérieur*
- *insulin / l'insuline*
- *intake / la consommation, la quantité absorbée ou ingérée*
- *intake / l'apport (calorique,etc.), la prise*
- *ion / un ion*
- *item / un détail, une donnée*
- *joint / une articulation*
- *joint / une articulation*
- *ketone body / un corps cétonique*
- *lack / manquer de, ne pas posséder*
- *lacteal / un vaisseau chylifère, une veine lactée (ainsi nommée à cause de la couleur blanchâtre du chyle)*
- *large intestine (a.k.a. large bowel) / le gros intestin*
- *largely / en grande partie, principalement*
- *layer / une couche, une épaisseur*
- *lean / maigre*
- *lifelong / tout au long de la vie*
- *lifestyle / le mode de vie, l'hygiène de vie (NB. une bonne hygiène de vie a healthy lifestyle / une mauvaise hygiène de vie an unhealthy lifestyle)*
- *likely to (be likely) / avoir des chances de…*
- *lipid profile / le bilan lipidique*
- *liver / le foie*
- *loss / la perte (de poids, etc.) NB. ne pas confondre "to lose" = perdre ; "loss" = la perte ; "lost" = perdu (cf. "Lost, les disparus")*
- *lower / baisser, réduire*
- *lymphatic system / le système lymphatique*
- *lymphatic vessel / un vaisseau lymphatique*
- *main / principal*
- *mainly / principalement, surtout*
- *management / la gestion, le contrôle (aussi : la prise en charge d'un patient)*
- *meal / un repas*

- *meal replacement / un substitut de repas*
- *meat / la viande*
- *meet / satisfaire, répondre à*
- *membrane / une membrane*
- *merge / fusionner, se rejoindre*
- *metabolic syndrome / le syndrome métabolique*
- *metabolism / le métabolisme*
- *metformin / la metformine*
- *milky / laiteux, blanchâtre*
- *minute / minuscule*
- *moisten / mouiller, humecter*
- *monounsaturated (fat) / (acide gras) monoinsaturé*
- *mouth / la bouche*
- *mucus / le mucus, les mucosités*
- *neutralize / neutraliser*
- *nitrogen / l'azote (m.)*
- *nutrient / un nutriment*
- *nuts / les fruits à coque (noix, noisette, amande, etc.)*
- *oat / l'avoine*
- *oatmeal / les flocons d'avoine*
- *obesity / l'obésité*
- *obvious / évident, manifeste*
- *oesophagus / l'œsophage*
- *office (doctor's office) / le cabinet médical*
- *oil / l'huile*
- *opportunity / une occasion*
- *ounce / une once (~30 ml)*
- *overall / global, général, d'ensemble*
- *overweight / le surpoids, en surpoids*
- *package into / empaqueter*
- *pain / la douleur*
- *pancreas / le pancréas*
- *pancreatic juice / le suc pancréatique*
- *Pap smear / un frottis vaginal*
- *particle / une particule*
- *peanut butter / le beurre d'arachide, de cacahuète*
- *peas / les petits pois*
- *pepsin / la pepsine*
- *per / par (unité)*
- *peripheral arterial disease / l'arteriopathie peripherique*
- *peristalsis / le péristaltisme*
- *pH / le pH*
- *physician / un médecin (en général, autre qu'un chirurgien), un médecin généraliste*
- *plentiful / abondant*
- *polyunsaturated (fat) / (acide gras) polyinsaturé*
- *portal vein / la veine porte*
- *pound / une livre (454 g)*
- *precursor / un précurseur*
- *process / traiter, transformer*
- *process / traiter, transformer, préparer*
- *produce / produire NB. ne pas confondre le verbe "to produce" et le nom "a product"*
- *protein / une protéine*
- *ptyalin / la ptyaline (amylase salivaire)*
- *purpose / objectif, raison, raison d'être*
- *pyloric sphincter / le sphincter pylorique, le pylore*
- *range / une fourchette (de valeurs), un éventail, une gamme*
- *rather / plutôt (que cela), au contraire*
- *readily / facilement, aisément*
- *rebuild / reconstruire*
- *recall / reconstitution, la remémoration*
- *record / enregister, inscrire*
- *rectum / le rectum*
- *refer / orienter vers, envoyer chez*
- *refer to (as) / désigner*
- *relaxation / la décontraction, le relâchement*
- *release / (re)lâcher*
- *rely on / dépendre de, être dépendant de*
- *remain / rester*
- *remaining / restant*
- *remote control / une télécommande*
- *require / nécessiter, exiger*
- *rest / le repos (aussi : se reposer)*
- *result from / résulter de, provenir de, être le résultat de (NB. ne pas confondre "result FROM" = être le résultat de, et "result IN" = avoir pour résultat)*
- *result in / entraîner, avoir pour résultat (NB. ne pas confondre "result FROM" = être le résultat de, et "result IN" = avoir pour résultat)*
- *rice / le riz*
- *rise / s'élever, augmenter*
- *risk factor / un facteur de risque*
- *roughly / approximativement, grossièrement, grosso modo*
- *saliva / la salive*
- *saturated / (acid gras) saturé*
- *scale(s) / une balance*
- *secrete / sécréter*
- *secrete / sécréter*
- *sedentary / sédentaire*
- *seed / une graine*
- *sensitivity / la sensibilité*
- *serving / une portion*
- *share / partager*
- *shortness of breath / l'essoufflement, la dyspnée*
- *side effect / un effet secondaire*
- *simple sugar / un glucide simple, un hexose*
- *skeletal muscle (≠ smooth muscle) / le muscle strié squelettique*
- *sleep apnea / l'apnée (f.) du sommeil*
- *slightly / légèrement, quelque peu*
- *small intestine (a.k.a. small bowl) / l'intestin grêle*
- *smooth muscle / le muscle lisse*
- *snack / un en-cas, une collation*
- *snoring / le ronflement*
- *soluble fiber / les fibres (f.) solubles (dans l'eau)*
- *spend, spent, spent / 1. dépenser(argent) 2. passer(du temps)*
- *squared / carré*
- *stairs / les escaliers*
- *starch / l'amidon*
- *starvation / l'inanition, la faim*
- *statins / les statines, les inhibiteurs de l'hydroxyméthylglutaryl-CoA réductase*
- *step / un pas*
- *stomach / l'estomac*
- *stool(s) / les selles*
- *store / conserver, stocker, mettre en réserve*
- *strawberry / la fraise*
- *strenuous / ardu, vigoureux*
- *stroke / un AVC (accident vasculaire cérébral)*
- *subclavian / la veine sous-clavière*
- *sugar / un sucre, un glucide*
- *sunflower / le tournesol*
- *supply / alimenter, approvisionner*
- *swallow / avaler*
- *sweep (NB. sweep/swept/swept) / balayer, parcourir*
- *switch to / changer, échanger, substituer*
- *synthesis / la synthèse*
- *take in / ingérer, absorber, assimiler*
- *take place / avoir lieu*
- *thereby / ainsi, de ce fait, par ce moyen*
- *thiazolidinedione / la thiazolidinedione*
- *thoracic duct / le canal thoracique*
- *throughout / partout (dans…), partout (à travers…)*
- *toe / un orteil*
- *triglyceride / un triglycéride*
- *unlike / différent de, à la différence de, contrairement à*
- *urea / l'urée (nf.)*
- *urine / les urines*
- *use / l'usage, l'utilisation – NB. pronunciation "a use" [s], "to use" [z]*
- *variety (of) / un mélange (varié)*
- *vegetable / un légume*
- *villus (pl. villi) / une villosité*
- *waist / la taille, le tour de taille*
- *wall / la paroi*
- *waste(s) / les déchets*
- *wave / une onde*
- *weight / le poids (NB. le verbe "peser" ne prend pas de "-t" à la fin : to weigh)*
- *well-woman examination / une consultation gynécologique de dépistage*
- *wheat / le blé, le froment*
- *whole (grain) / complet (céréale, pain, etc.)*
- *World Health Organization (WHO) / l'OMS*
- *yield / produire, donner, rapporter*
- *yolk / le jaune (d'oeuf)*