

Nutrients: The Basics

1. Name the 6 groups of nutrients:

Proteins, carbs, lipids/fats, vitamins, minerals, water

2. Proteins are made up of *amino acids*. They are often called:

Building block of life

3. There are 20 different *amino acids* that make up protein. 9 amino acids are called:

essential and 11 are called non-essential.

4. List 3 bodily functions proteins are needed for:

Energy, make enzymes and hormones, make bones

5. List 3 sources of protein from animal based foods:

Chicken, pork, beef

6. Mostly, carbohydrates are produced in green plants by a process called:

photosynthesis

7. Three major carbohydrate-containing foods are:

Cereals, sugars, vegetables, fruits, pulses

8. Carbohydrates are our bodies' main source of:

Energy → quickly converted

9. Health authorities generally recommend that 40-45% of our energy intake should come from complex carbs with only 15% coming from simple →sugars.

10. There are 2 types of fibre: soluble and insoluble

11. Fats are also known as: lipids

12. List 3 bodily functions fats are needed for: building cell membrane, hormones, insulation, needed for absorption

13. Most national health bodies recommend that fats should only provide around 30 % of our total energy intake.

14. Fats can be saturated, mono unsaturated, or poly unsaturated

15. Fats that are not converted to energy in the body are stored in the body as fat

16. Cholesterol is a fatty substance produced by our liver

17. List 3 sources of Omega-3 fatty acids. Fish, nuts and seeds e.g. flax, dark green vegetables

18. There are two types of vitamins: fat soluble and water soluble.

19. List 3 bodily functions vitamins are needed for: energy release, making red blood cells, blood clotting, maintenance e.g. connective tissue

20. Vitamin D is made in the body.

21. Only about 4 % of our body weight is made up of minerals.

22. Minerals are found in:

Teeth Yes

Bones Yes

Muscles	Yes
Soft Tissues	Yes
Blood Cells	Yes
Nerve Cells	Yes
Saliva	No

23. **Anaemia is caused by a deficiency of:** *iron → get very tired*
24. **List 3 ways iron is lost from the body.** *Loss of blood, e.g. menstruation, give blood, injury*
25. **List 2 food sources of iron.** *Red meat, spinach*
26. **In western countries about 4 % of boys and 10 % of girls consume less than half the recommended daily intake for iron and that places them at risk of getting anaemia.**
27. **Mostly, calcium in the body is found in the:** *bones*
28. **List 2 animal-based food sources of calcium and 2 non-animal sources of calcium.** *Milk, fish, soybean, spinach*
29. **Girls and women should ensure they get enough calcium during the 3 major development stages:** *breast feeding, menopause, adolescence*
30. **Around 25% of kids between the ages of 10 and 15 consume less than half of the recommended daily intake of calcium.**
31. **Adult females are made up of 51 % water and adult males are 60 % water.**
32. **A newborn baby's body is made up of 70% water.**
33. **The human brain is about 75% water.**
34. **List 3 bodily functions water is needed for.** *Regulate temperature, cushion joints, elimination of waste, needed in blood, bones, muscles, body fat*
35. **We should drink between 1 litres and 2 litres of water per day in our food and drink.**
36. **Sleeping requires very little energy.** *No*
37. **If your body requires less energy than you've consumed, the energy will be converted to:** *fat and gain weight*
38. a. **More adult Americans are obese than overweight** *No*
b. **More adult Australians are obese than overweight** *No*
39. **RDI is an abbreviation of:** *recommended daily intake*
40. **RDIs are usually set higher than what's required by most healthy people.** *Yes*

Nutrients - Their Interactions

Questions and Answers

1. What are the six main groups of nutrients?

Proteins, carbohydrates, lipids, vitamins, minerals and water.

2. What are three main functions we need nutrients for?

*the production of energy
for growth, repair and maintenance of hard and soft tissue
for regulation of the body's processes.*

3. Define energy.

Energy is the force or power that makes it possible for our bodies to function.

4. What do we use energy for in our bodies?

*Basal metabolic activity
Physical activity
Digestion, absorption and metabolism of food.*

5. Define "Basal Metabolic Rate".

The Basal Metabolic Rate is the minimum energy needed to sustain life in a resting individual. The amount of energy our body would burn if we slept all day and night, just maintaining nerve activity, heart, lung and kidney function and body temperature.

6. What determines an individual's basal metabolic rate?

A number of factors such as Age, Height, Gender, Growth, Body Composition, and Environmental Temperature.

7. Do males generally have a higher or lower basal metabolic rate?

Males generally have a higher BMR.

8. Is the BMR higher in younger or older people?

The BMR is generally higher in younger people.

9. Can our BMR be affected by environmental conditions?

Environmental Temperature: Heat and cold raise the BMR.

10. What percentage of energy consumed is used to digest, absorb, transport and store the food we eat?

Approximately 10%.

11. What food sources does most of our energy come from?

Almost all of our energy comes from carbohydrates, fats and proteins.

12. There are two types of carbohydrates. Name them.

Complex and simple.

13. Where do we find complex carbohydrates?

Complex carbohydrates come in cereals, grains, vegetables, rice, pasta, fruits and dairy products.

14. Where do we find simple carbohydrates?

Simple carbohydrates are found in sugar, syrups and drinks.

15. Approximately how much energy does one gram of carbohydrate provide?

About 16kJ of energy.

16. How does this compare to the energy yield from fat?

Every gram of fat yields more than twice as much energy as carbohydrate.

17. Why are carbohydrates the body's preferred energy source?

Often the foods that contain carbohydrates also contain vitamins, minerals & fibre and provide most of the energy in our diets.

18. Approximately how much energy does one gram of protein provide?

About 16kJ of energy, like carbohydrates.

19. What food sources are rich in protein?

Meat and nuts.

20. What are the recommended ratios of energy sources?

Health authorities generally recommend that about 55% of our energy intake should come from carbohydrates. 40 to 45% of our energy intake should come from complex carbohydrates with only 15% coming from sugars or simple carbohydrates. The balance should come from fats and protein.

21. Generally are we achieving this balance of energy sources?

No.

22. In what way?

Many of us are eating too little complex carbohydrate and too much fat which means we're probably consuming more energy than we need.

23. What health effects are associated with this?

Too much body fat can lead to significant health problems such as cardiovascular disease and diabetes.

24. The B vitamins are central to what process in the body?

They regulate the process of energy release from carbohydrates, fats and proteins. Without the involvement of these B vitamins the body's cells may not get the energy they require.

25. The mineral iodine is an essential part of which hormone?

Thyroxine.

26. What does thyroxine regulate?

The body's metabolic rate.

27. Why is water so essential to the body's chemical reactions?

Water is also essential because all chemical reactions occur in water based solutions.

28. In the case of the body, the fuels we use are carbohydrates, fat and proteins. What sparks energy release from this fuel?

To release the energy from the fuel we need B group vitamins.

29. What other naturally occurring gas do we need as part of the energy release process in our bodies?

Oxygen.

30. What mineral enables oxygen to get to cells for energy production?

Iron.

31. What nutrient acts as a thermostat in the body's heat production process?

Iodine.

32. What is the basic unit of all life?

The cell.

33. "Soft tissue" refers to what types of tissue?

Muscle, brain and blood tissues.

34. Hard tissue refers to what types of tissue?

Bone, teeth and cartilage tissues.

35. What is the major nutrient necessary for cell development?

Proteins make up around 20% of all our bodies' cells. When cells divide, new protein molecules have to be made to form the basic structure of each new cell.

36. What are commonly called the "building blocks of life"?

Amino acids.

37. Why do you think they are called this?

During digestion, protein is broken down into a variety of amino acids. These are the basic components of protein and protein molecules form the basis of every cell.

38. Can you recall what other nutrients are needed for cell growth?

Water, lipids, folate, vitamin A and vitamin C.

39. What role does each of them play?

Water forms an essential part of the cell's nucleus and composition.

Lipids are an essential part of the cell's membrane or outer wall.

Folate is necessary for cell division and to make deoxyribonucleic acid or DNA, which carries our genetic information.

Vitamin A is essential for cell division and growth

Vitamin C assists in the healing of wounds.

40. Give a biological definition of blood.

Blood is a type of connective tissue largely made up of water and protein.

41. What are the components of blood?

Plasma, red blood cells, white blood cells, platelets.

42. What percentage of plasma is composed of water? 30%, 60% or 90%?

90%.

43. What is the function of red blood cells?

Red blood cells carry oxygen from the lungs.

44. What is the function of white blood cells?

White blood cells help to fight infection.

45. What is the function of platelets?

Platelets assist with clotting, stopping the flow of blood to assist with healing.

46. Name the six main nutrients needed to make healthy blood cells.

Protein, water, iron, folate, Vitamin B12 and Vitamin C.

47. What is the role of folate and Vitamin B12?

They are needed to make DNA or the genetic material of the cell and to ensure the proper formation of red blood cells. Without sufficient folate and Vitamin B12, red blood cells may not develop properly which will interfere with their capacity to carry oxygen.

48. What role does Vitamin C play in the formation of healthy blood cells.

Vitamin C assists in the absorption of iron necessary to make haemoglobin, a vital protein in red blood cells which carries oxygen. Vitamin C is also needed for the development of the walls of the veins and arteries.

49. What is cartilage?

Cartilage is a dense network of collagen and elastin fibres which forms into bone-like shapes. Both bones and teeth form around these structures.

50. What do bones consist of?

Bones are made up of a variety of materials such as blood cells, nerve cells, fat, protein, calcium and phosphorous.

51. What is collagen?

Collagen is a soft tissue which gives bone structure.

52. Which minerals are deposited into collagen during ossification?

calcium and phosphorous are deposited in collagen causing bones to harden.

53. Name two vitamins vital to ossification.

Vitamin D and A. Vitamin D is needed to promote the absorption of calcium and phosphorous and to keep the calcium and phosphorous in balance. Vitamin A controls bone cell activity and as such is essential to enable the bones to lengthen which is critical during periods of growth.

54. Bones act like “banks” for which nutrient?

Calcium.

55. How is fibre good for bowel health?

Water binds with fibre in the large intestine, softening faeces making it easier for it to be excreted from the body. This reduces pressure on the large intestine which helps to prevent conditions such as constipation, haemorrhoids and colon cancer.

56. How does fibre help to reduce cholesterol?

Fibres in oats, barley and legumes bind with cholesterol which is then excreted. Also, bile acids bind to fibre and are then excrete. Because we use cholesterol to make bile acids, the more bile we excrete, the more cholesterol which is converted to bile acids. This leads to an overall lowering of blood cholesterol levels.

57. How do we get enough nutrients?

By eating a wide variety of food in the recommended proportions, we'll get all the nutrients we need.

58. Recommended Dietary Intakes are set around 20% 30% or 50% higher than required by most healthy people?

30%.