**Carbohydrates**

Naturally occurring compounds composed of carbon (C), hydrogen (H) and oxygen (O) made by plants by photosynthesis

Their primary function is to supply **energy**. Up to 50% of all the energy we need comes from carbohydrates. Commonly found in bread, potatoes, pasta, fruit.

Enter food chain by plants being consumed or through decay of plants.

All carbohydrates are made up of units of sugar

Monosaccharides and disaccharides are referred to as **simple sugars**

Long chains of simple sugar units bonded together are referred to as **Complex carbohydrates**

Chemicals whose name ends –ose (eg, glucose, sucrose, cellulose) are all sugars

**Monosaccharides** – Single sugar units.

Examples: Glucose, Fructose, Galactose

**Disaccharides** -Formed when two monosaccharides chemically bond with each other.

Examples:

|  |  |  |
| --- | --- | --- |
| **Disaccharide** | **Monosaccharides** | **Info** |
| Sucrose | Glucose + fructose | Table sugar (from sugar cane) |
| Lactose | Glucose + galactose | Milk sugar (only sugar made by an animal) |
| Maltose | Glucose + glucose | Malt sugar (made by action of amylase on starch) |

**Complex carbohydrates** - long chains of simple sugar units bonded together

Examples: Starch, glycogen and cellulose

Cellulose – composes cell walls. Indigestible to us and so forms fibre in our diet

Starch and glycogen are used to store excess carbs in plants (starch) and animals (glycogen)

**Lipids**

glycerol

Naturally occurring compounds composed of carbon (C), hydrogen (H) and oxygen (O)

**Insoluble** in water

Provide concentrated sources of **energy** (40% of the energy we need comes from lipids), and act as **insulators**. Also important components of the cell membrane, as hormones and in your nervous system.

Food sources include butter, cream, oil, meat and cheese.

Large molecules that are made up of two parts:

* + **3 fatty acid molecules (the ‘tails’ on the above lipid)**, which make up most of the fat molecule
  + **Glycerol**

The glycerol is always the same but the fatty acids vary. It is the different fatty acids that cause some lipids to be solid and some to be oil. It is also the fatty acids that determine whether a fat is saturated or unsaturated.

We use fats to give us energy when we run out of glucose. When this happens, it’s the **glycerol** we use

Lipids are fats (solids) and oils (liquids). They are the most efficient energy store in the body.

We need a certain amount of fat in our diet but excess fat is stored in the arteries and can cause artheroscelosis (furred arteries).

**Proteins**

Naturally occurring molecules composed of carbon (C), hydrogen (H), oxygen (O) and nitrogen (N)

Protein-rich foods include meat, fish, cheese, milk and bread

Subunits = **amino acids**

Long chain of amino acids (greater than 50 amino acids) = protein

Amino acids in the chain are joined by **peptide bonds**

There are 20 different amino acids in humans. They act like letters of the alphabet the can be put in infinite combinations to make up different proteins. Different arrangements of amino acids in the chain give different proteins

Important for growth and to repair damaged tissues. Muscles are mainly made up of protein.

The long chains of amino acids are folded to produce a specific shape that enables other molecules to fit into the protein. It is the sequence of amino acids AND the shape of the resulting protein that determines its properties.

In addition to being important for growth and repair, proteins act as:

* Hormones
* Antibodies
* Enzymes

The body doesn’t use proteins directly but instead breaks them down into amino acids which it can absorb and then use as building blocks to make any proteins that it needs.

**Nutrition**

The body is made up of chemicals. You get these chemicals from the food you eat.

You need food for:

* **Energy** – to work your muscles and other organs. Your food is fuel.
* **Growth and repair** – as you grow, you make new cells. You also need to replace old or damaged cells. You make new cells from the chemicals in your food
* **Staying healthy** – lots of reactions take place in your cells. Chemicals in your food are needed for these reactions

The 7 food groups are:

Protein

Fat

Carbohydrates

Fibre

Vitamins

Minerals

Water

We need a healthy **balanced** diet. Remember also that a balanced diet will change depending on a person’s age, gender and how active they are. Also, the amount of energy that you need will depend on a number of different factors, including age, body size, etc.

If you eat more food that you need, you store the extra as fat.

Your **energy intake** is the amount of energy you get in your food in a day.

Your **energy output** is the amount of energy you use up in a day

If energy intake is greater than energy output then you will put on weight