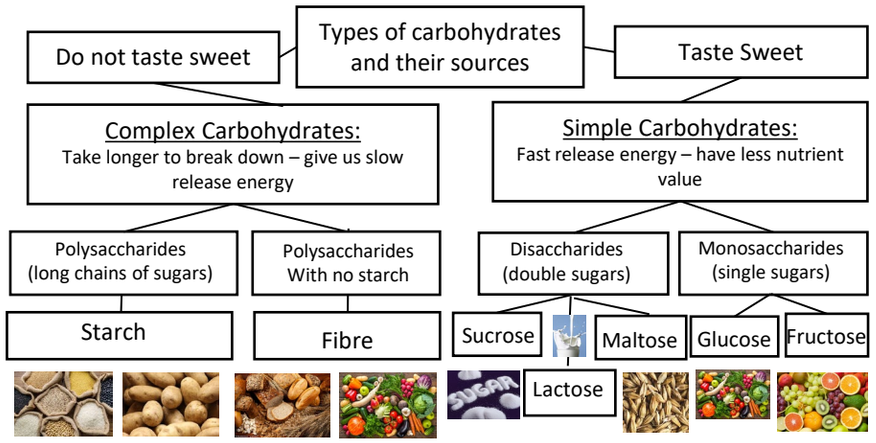
Macro-Nutrients

Keywords and definitions:

Amino acids: small molecules that form long chains in proteins
Cholesterol: A type of fat found in the blood. It is made in the liver and obtained from saturated fatty foods.
Constipation: when faeces becomes difficult to expel from the body.
Disaccharide: when two monosaccharides join together to form a double sugar
Diverticular Disease: When pouches form in the intestines and become infected with bacteria.
Essential amino acids: x8 amino acids that can only be obtained through the diet
Fat-soluble vitamins: Vitamins A, D, E, K – are stored in the body longer than water-soluble vitamins
Fatty Acids: Fat is made up of fatty acids and glycerol
Glycerol: Part of a fat molecule
High Biological Value (HBV): Food sources such as animal proteins, that contain all essential amino acids.
Hydrogenation: Making a solid fat from a liquid fat
Kwashiorkor: A severe form of protein malnutrition.
Low Biological Value (LBV): Protein from plant sources, does *not* contain all essential amino acids (the exception is soya)
Monosaccharide: the simplest form of carbohydrates – single sugars.
Non-starch Polysaccharide (NSP): the scientific name for dietary fibre
Polysaccharide: - Long chains of monosaccharides
Protein Complementation: when LBV food are eaten together to provide all essential amino acids e.g. beans on toast
Saturated Fats: A fat that comes predominantly from animal sources
Texturised vegetable protein (TVP): A types of protein obtained from soya beans and made to resemble minced meat
Trans fats: When oil goes through the hydrogenation process
Unsaturated Fats: A fat that comes predominantly from plant sources

Carbohydrates:

- Carbohydrates predominantly provide the body with energy.
- Carbohydrates are mainly produced by plants during photosynthesis
- Sugars and Starches are types of carbohydrates (see below chart)
- Complex carbohydrates are healthier than simple carbohydrates
- Excess carbohydrates are stored as fat which can lead to obesity
- Excess sugar can lead to dental decay and Type 2 Diabetes
- Deficiency of carbohydrates can lead to loss of energy and weight, the body will use fat and protein as alternative energy sources.



Protein:

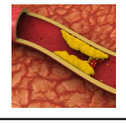
- Protein is required by the body for growth, maintenance and repair.
- Proteins are made up of amino acids.
- There are 8 essential amino acids, we have to get them from foods
- Proteins with all 8 essential amino acids - High Biological Value(HBV)
- Proteins without all 8 essential amino acids - Low Biological Value (LBV)
- Animal sources (chicken, eggs, beef etc.), Quorn and TVP are HBV.
- Vegetable sources (seeds, beans, nuts, lentils etc.) are LBV
- Different LBV proteins can be eaten together to get all amino acids – this is called protein complementation
- Excess protein is converted to energy. Also it can raise the levels of nitrogen in your body. Making your kidneys and liver work harder.
- Deficiency of protein is rare, but Kwashiorkor can be seen in developing countries. This is severe malnutrition, often in young children.
- Some groups of people need more protein than others e.g. babies and children for growth, pregnant women for the growing baby.

● = essential amino acid ● = non essential amino acid

Fat:

- In the body, fat provides concentrated energy, fat-soluble vitamins, protects major organs and is a component of hormones.
- Fat can be a solid or liquid.
- Fat is made up of fatty acids and glycerol
- Different fats have different melting temperatures, this is plasticity.
- Saturated fat usually comes from animal sources and is solid at room temperature e.g. butter – these are more unhealthy
- Unsaturated fat usually comes from plant sources and is liquid at room temperature e.g. olive oil – these are considered the "healthier" fats
- Saturated fats can increase the cholesterol level in the blood
- Unsaturated fats can reduce cholesterol in the blood
- Making a solid fat from a liquid oil is called hydrogenation. Trans fats are produced during hydrogenation.
- Trans Fats have been linked to health problems including heart disease and some cancers
- Excess at can lead to weight gain and higher blood cholesterol levels, this can lead to obesity and coronary heart disease (CHD)
- Fat deficiency in babies and children can affect normal growth
- Fat deficiency in adults can result in deficiencies of fat-soluble vitamins.

Cholesterol in the blood stream blocking arteries – directly leading to high blood pressure and CHD



Water:

- The body needs water for
  - Normal brain function
  - Decrease the risk of kidney problems
  - Normal blood pressure
  - Help with bowel movements
  - Regulate body temperature
  - Maintain hydration
  - Making body fluids e.g. blood, saliva, mucus
- Main sources of water include water, milk, tea, coffee and fruit juices
- Some water comes from foods such as soup, yoghurt and fruit.
- 6-8 glasses of water should be drank every day
- Some people will need to drink more water e.g. active people, people who are ill, elderly people, during hot weather.

Dietary Fibre:

- The body needs fibre to help keep the digestive system moving.
- Adults should eat 18g a day.
- The scientific name for fibre is Non-Starch Polysaccharide (NSP)
- Soluble NSP absorbs water forming a gel-like substance, this can help prevent the absorption of cholesterol.
- Insoluble NSP is not absorbed by the body. It passes through the body as waste which helps prevent bowel disease.
- Dietary Fibre makes food matter soft and bulky.
- You can get fibre from wholemeal and wholegrain carbohydrates and vegetables
- Fibre deficiency can lead to constipation and diverticular disease and sometimes cancer.