Carbohydrate —as a macro nutrient 1.1.3

Key Words

Photosynthesis: The process by which green plants trap energy from the sun and form carbohydrates
Sugars: a group of carbohydrates that taste sweet
Monosaccharides: a group of sugars made up of one sugar molecule
Disaccharides: a group of sugars made up of two sugar molecules
Polysaccharides: (Complex carbohydrates): a group of carbohydrates made up of many sugar molecules joined together but do not taste sweet
Glucose: the carbohydrate the body uses for energy production during respiration
Non starch polysaccharide: also known as dietary fibre. Bulks to the digestive system so that waste food moves along and is removed easily
Insoluble fibre: dietary fibre which helps prevent constipation
Soluble fibre: dietary fibre which helps reduce cholesterol

What they are and what they are made of:

•A macronutrient found in plant foods. The process by which plants make carbohydrates is photosynthesis

•Carbohydrates are classified into two main groups: sugars and complex carbohydrates

•Sugars: a group of carbohydrates tasting sweet. Plants produce 2 types during photosynthesis:

-Monosaccharides: one sugar molecule. Fructose, glucose, galactose

-Disaccharides: two sugar molecules. Sucrose, maltose, lactose

Complex carbohydrates: Do not taste sweet. Plants produce several types called **Polysaccharides**: Starch, pectin, dextrin, dietary fibre (also called non starch polysaccharide NSP) Also glycogen (made in mammals and humans) from the foods eaten.

Functions in the body (what they do in the body)

•Main energy source

•NSP (insoluble fibre) helps the body get rid of waste products: NSP helps to produce soft, bulky faeces (solid waste) which are easy to pass out of our body when we go to the toilet. Keeps digestive system healthy; controls weight; helps us feel fuller for longer. Soluble fibre (oats, nuts, peas, beans, lentils, prunes, bananas, pears, sweet potatoes + carrots slows down digestion and absorption of carbs. So helps to control blood sugar levels, which helps you stop feeling hungry. Could help reduce cholesterol levels.

Effects of deficiency: This is rare in the U.K.

•Lack of weight, tiredness

•Severe weakness

Effects of excess: If the diet has more energy (carbs) than it needs, the body converts and stores as fat. A contributory factor to CHD.

•Dental caries – particularly with younger age groups whose teeth are forming.

•Possibility of depression in adults: sugar causes a feel good chemical to be released by brain and quick bursts of energy. When blood sugar lowers can lead to depression.

•High sugar levels can cause inflammation in the body and lead to rheumatoid arthritis in later life.

•High sugar levels can damage collagen and elastin fibres in the skin and cause premature ageing of the skin .

•Liver problems can be caused by high sugar levels. Resistance to insulin that controls and turns sugar in blood stream into energy can lead to type 2 diabetes.

•Extra insulin in the blood stream can affect the arteries causing them to thicken which can lead to heart disease, heart attacks and strokes.

Sources:

Sugar: monosaccharides

Glucose: ripe fruit + veg. Available in drinks, tablets + powders.

Fructose: fruits, veg. + honey. Sweetener (HFCS) High Fructose Corn Syrup used as a sweetener in processed foods)

Galactose: milk from mammals.

Sugar: Disaccharides

Maltose: Cereals e.g. barley

Sucrose: extracted from sugar cane. AKA sugar.

Lactose: milk from mammals and products made from it e.g. yogurt, cheese

Complex carbohydrates:

Starch: cereals e.g. wheat, oats, barley + maize and cereal products e.g. breakfast cereals, pasta, bread); starchy veg. e.g. potatoes, yams, parsnip, peas + butternut squash

NSP: wholegrain cereal + cereal products e.g. breakfast cereal + pasta. Veg. fruit, pulses

Pectin: some fruits e.g. oranges, apples, plums + apricots + some root veg. e.g. carrots

Amount needed for different life stages Is calculated as a percentage of total daily energy intake. Rather than by weight (except NSP). The energy value of carbohydrate is 3.75g/16kJ of energy.

From 2 years+ this is the recommended intake:

Type of carbohydrate	% of food energy per day
Total carbohydrate	50%
Free sugars	No more than 5% of total carb. intake. Meaning no more than: (tsp. = teaspoons) 19g/day (4 tsp.) free sugars children 4 – 6 years 24g/day (5 tsp) children 7 – 10 years 30g/day (6 tsp) for children11 and adults
Non Starch Polysaccharide (NSP) dietary fibre	**Adults**: at least 30g each day **Children**: each day **2 – 5**: 15g **5 – 11**: 20g **11 – 16**: 25g **16 – 18**: 30g

Watch out for: Hidden sugars mainly in processed foods: Look for these names – Molasses, Glucose syrup, Glucose-fructose syrup, treacle, maltose, fructose, sugar cane, sucrose, granulated sugar.