

# Carbohydrates

March 2009

## What is carbohydrate?

Carbohydrates are compounds composed of carbon, hydrogen and oxygen. They are the main source of fuel for the body, especially the brain and nervous system. Although fat and protein are also a source of energy, they aren't used as effectively by our bodies. The main types of carbohydrate are:

- **Starch:** found in grains, cereals, legumes, nuts, seeds and vegetables such as potato and corn.
- **Sugar:** found naturally in foods like fruit, milk and yoghurt, and added to foods like soft drinks, cakes and biscuits for sweetness. Glucose and fructose are simple sugars, or monosaccharides, and can be found in fruits, berries, vegetables and honey. Table sugar or sucrose is a combination of glucose and fructose. These sugars also occur naturally in both sugar beet, sugar cane and fruits. Lactose is the main sugar in milk and dairy products and maltose is a disaccharide occurring in malt.
- **Dietary fibre:** carbohydrate found in plant foods which passes through the body undigested. The main sources of dietary fibre are cereals, fruits, vegetables, nuts and legumes.

## Carbohydrates in the body

The main function of carbohydrates is to provide energy. After a meal, starch and sugars are broken down into glucose, which can be stored in the body and then used by muscles to provide fuel for activity. Glucose is also the sole source of energy for the brain, nervous system and red blood cells. Although some dietary fibre is used for energy, most escapes digestion and passes through to the bowel where it helps maintain bowel health and prevent constipation.

## How much carbohydrate should I eat?

It is recommended that 45-65% of our daily energy (kilojoule) intake come from carbohydrates. For an average adult, this is equal to about 230g-330g of carbohydrate. This equates to approximately:

- Four or more servings of bread, cereals, rice, pasta or noodles
- 2 serves of fruit
- 5 serves of vegetables or legumes
- 2-3 serves of low-fat dairy products

A diverse range of carbohydrate food sources should be consumed to ensure that your overall diet is nutritionally adequate.

## How much sugar should I eat?

Sugars are often found naturally in foods or can be added

during processing. Although they're an important source of energy, eating too much sugar can have harmful effects. High sugar foods have been associated with obesity and tooth decay and can displace more nutritious foods from the diet.

## Glycaemic index

When carbohydrate foods are eaten they produce a rise and subsequent fall in blood glucose levels known as the 'glycaemic response'. The rate at which a food releases glucose into the blood stream is called the 'glycaemic index' (GI). Carbohydrate-containing foods are ranked on a scale of 1-100 according to the glucose response they produce. Low GI foods (a GI less than 55) raise blood glucose levels slowly. Low GI foods can assist blood glucose control in people with diabetes and can also assist with weight management by controlling feelings of hunger.

Low GI foods include wholegrain breads and cereals, pasta, some varieties of long grain rice, legumes, corn, sweet potato and many fruits and vegetables. It is important to remember that GI should not be considered in isolation from other healthy eating principles and to choose foods which are low in total fat, saturated fat, salt and sugar, and high in fibre. Be sure to include a wide variety of foods in your diet every day.

## Low carbohydrate diets

Low carbohydrate diets such as the Atkins Diet, the Zone and Sugar Busters recommend that people consume kilojoules mainly from protein and fat. Advocates of these diets believe that carbohydrates cause weight gain and should therefore be limited. Carbohydrates alone, however, do not cause weight gain. Weight gain occurs when daily energy intake from food exceeds output as physical activity. Replacing dietary carbohydrate with fat - especially saturated fat - is linked with serious health problems including heart disease, diabetes and some cancers. Very high protein intakes can affect bone health and place stress on the kidneys. Also, many of these diets are nutritionally inadequate as they restrict fruit, some vegetables and high fibre breads and cereals.

## Carbohydrates and weight control

As well as providing energy, carbohydrates can indirectly help to control weight. Fat is higher in kilojoules than carbohydrate, so replacing fatty foods with carbohydrate-containing ones can reduce overall energy intake. Meals high in carbohydrate also provide satiety (feelings of 'fullness') which helps reduce appetite and overeating.