



A Simple guide to:

## SUGARS

You've probably heard the terms **fructose**, **glucose**, **lactose** and **sucrose** before, and you may know that they're all types of sugar. But do you know how they differ from one another, or whether some are better for you than others?

Sugar is very much linked to carbohydrates:

Carbohydrates are classified into two basic groups, complex and simple.

Complex carbohydrates are composed of multiple simple sugars, joined together by chemical bonds. The more chains and branches of simple sugars, the more complex a carbohydrate is and in turn, the longer it takes to be broken down by the body and the less impact it has on blood sugar levels. Examples of complex carbohydrates include wholegrains such as jumbo oats, brown rice, spelt, rye and barley.

Simple carbohydrates are either monosaccharides (one sugar molecule) or disaccharides (two sugar molecules). They are digested quickly and release sugars rapidly into the bloodstream. The two main monosaccharides are **glucose** and **fructose**. The two major disaccharides are **sucrose** (composed of glucose and fructose) and **lactose** (which is made up of galactose and glucose)



## GLUCOSE

### What is glucose?

Glucose is the primary source of energy your body uses and every cell relies on it to function. When we talk about blood sugar we are referring to glucose in the blood. When we eat carbohydrates, our body breaks them down into units of glucose. When blood glucose levels rise, cells in the pancreas release insulin, signalling cells to take up glucose from the blood. As the cells absorb sugar from the blood, levels start to drop.

### The nutritional profile of glucose

The glycaemic index is a ranking of how quickly foods make your blood sugar levels rise after eating them. High GI foods are very easily broken down into glucose. Glucose is the defining standard and has a GI value of 100. Glucose alone does not taste particularly sweet compared to fructose and sucrose.

### How does glucose affect your body?

Research suggests that, as glucose stimulates insulin release from the pancreas, it also results in the release of two other hormones, **leptin** and **ghrelin**. Leptin is known as the appetite suppressor and ghrelin the appetite increaser. It is thought that lower GI foods (such as wholegrains, proteins and those lower in glucose) suppress ghrelin, therefore regulating satiety

## FRUCTOSE



### What is fructose?

Fructose or fruit sugar, is a simple sugar naturally occurring in fruit, honey, sucrose and high fructose corn syrup. Fructose is very sweet, roughly one-and-a-half times sweeter than sucrose (white sugar). Because of the worldwide increase in the consumption of sweeteners - in soft drinks and foods containing high fructose corn syrup (HFCS) - fructose intake has quadrupled since the early 1900s.

## **The nutritional profile of fructose**

Fructose is absorbed directly into the bloodstream during digestion and has no impact on insulin production or blood glucose levels. Consequently, its GI value is much lower, on average around 19. It was once thought this made it a good substitute for table sugar, but there is now a growing body of research to question this.

Sweeteners such as HFCS have a higher GI value due to the presence of glucose. It has been suggested that it is the glucose content of these sweeteners that may have contributed to the increase in cardiovascular disease and type 2 diabetes. (sweeteners are artificial sugars).

## **How does fructose affect your body?**

Fructose is handled by the body in a different way to glucose as it is metabolised in the liver. As a result, blood sugar (glucose) levels do not rise as rapidly after fructose consumption compared to other simple sugars. When you eat too much fructose the liver cannot process it fast enough and instead, starts to make fats that are carried in the blood and stored as triglycerides- the body's main form of fat. Studies have shown that the consumption of large amounts of fructose may lead to increased appetite by impairing the body's ability to use insulin and to suppress circulating ghrelin (the appetite-stimulating hormone).

While most diabetics cannot tolerate sucrose, most can tolerate moderate amounts of fruit and fructose without loss of blood sugar control. Research is yet to show any detrimental health effects of moderate consumption of fructose as part of a balanced diet.

## **SUCROSE**



## **What is sucrose?**

Sucrose is crystallised white sugar produced by the sugar cane plant and can be found in households and foods worldwide. Sucrose is a disaccharide made up of 50% glucose and 50% fructose and is broken down rapidly into its constituent parts.

## **The nutritional profile of sucrose**

Due to its glucose content, sucrose has a GI value of 65. As it is made up of glucose and fructose, the latter is metabolised in the liver and holds the same issues as those mentioned for fructose above. Due to its glucose content, sucrose does lead to an

elevation in blood glucose. Diabetics should therefore be mindful of foods containing sucrose

## LACTOSE

### What is lactose?

Lactose is a sugar found in milk. It is a disaccharide made up of glucose and galactose units. It is broken down into the two parts by an enzyme called lactase. Once broken down, the simple sugars can be absorbed into the bloodstream.

### The nutritional profile of lactose

Whole milk has a GI value of 41 and is considered to be a low GI food. It is broken down slowly and helps to increase the absorption of minerals such as calcium, magnesium and zinc. Some people experience lactose intolerance— an inability to produce the lactase enzyme that breaks down milk. Lactose intolerance can lead to diarrhoea, bloating and other gastrointestinal symptoms

### Conclusion

There are two types of sugar: naturally occurring sugar like lactose in milk and added sugar, which includes table sugar (sucrose) as well as concentrated sources like fruit juice.

The current recommendations from the World Health Organisation (WHO) are that only 5% of your daily calorie intake should consist of added, or 'free' sugars. This equates to approximately seven teaspoons (30g) for an adult. To put this into perspective, one can of fizzy drink may contain seven teaspoons or more, so it's easy to reach the recommended daily amount, especially when you consider the sugar added to food that you don't see.

Eating excess sugar can lead to weight gain, which increases the risk of heart disease and type 2 diabetes. Your body needs sugar, but you have to control its intake.

