

clips on sugars

FOR UP-TO-DATE INFORMATION ON SUGARS IN HEALTHY EATING

Facts on Sugars

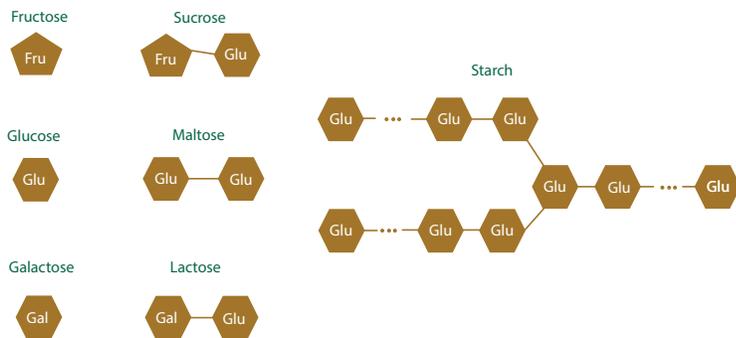
Sugar has been in the human diet for centuries but recently there has been considerable media attention focused on sugars, particularly in relation to weight and overall health. Often, this information is not supported by scientific fact and some messages are misleading and incomplete. It can therefore be challenging to separate fact from fiction. This resource will help to provide:

- A better understanding of how sugars are broken down and utilized in the body
- A comparison between naturally occurring and added sugars
- The functions sugar plays in foods
- A better understanding of total sugars content on the Nutrition Facts table.

What are sugars?

The simplest types of sugars include fructose, glucose and galactose¹. When one glucose and one fructose are joined together they become sucrose (table sugar) and when one glucose and one galactose are joined together they become lactose, which is present in milk and dairy products. Maltose, commonly found in potatoes and grain products, is formed from two glucose units joining together. While the term "sugar" refers specifically to sucrose, the term "sugars" is used to describe sucrose plus the other types of sugars found in nature such as glucose, fructose and lactose. Thousands of glucose units linked together are referred to as starch (Figure 1). Both sugars and starches are members of the carbohydrate family.

Figure 1. Make-up of Different Carbohydrates



How are sugars used by the body?

Sugars and starches are common types of dietary carbohydrates. When consumed, they travel through the gut and continue to be broken down into their simplest form (e.g. glucose, fructose and galactose) ready to be absorbed and used by the body¹. Glucose is the main source of fuel for all organs and tissues. Certain cells such as red blood cells (that deliver oxygen around the body) depend only on glucose for their energy needs. When blood glucose levels are low, glucose is restocked through the breakdown of dietary carbohydrates, released from glucose stores in the liver and muscles, or produced from other sources of energy such as fructose, galactose and even proteins.

Macronutrients include carbohydrates, protein and fat, which provide energy (Calories) and important functional roles in the body. All carbohydrates provide Calories: sugars and starches provide 4 Calories per gram whereas fibre provides 2 Calories per gram (Table 1). Remember that balancing total "Calories in" from foods and beverages with "Calories out" through daily activities and exercise is essential for weight management.

Table 1. Sources of Calories²

Source of Calories	Calories per gram
Sugars, starches	4
Fibre	2
Fat	9
Protein	4
Alcohol	7

What is the difference between naturally occurring and added sugars?

"Sugar" is pure sucrose, a natural product of photosynthesis and occurs in almost all fruits and vegetables along with other sugars like fructose and glucose. The table sugar we purchase from grocery stores is obtained from sugar cane or sugar beet. It is often thought that there is a difference between naturally occurring sugar and sugar added to foods however, once absorbed, the body uses sugar (sucrose) from sugar cane and sugar beets in the same way it uses sugar (sucrose) from fruits and vegetables. For example, the sucrose in a banana is the same as the sucrose found in table sugar; both are broken down into glucose and fructose to be used in the body. Regardless of its source, each gram of sugar supplies the body with 4 Calories. The same principle applies to other types of sugars.

Can you be "addicted" to certain foods?

The pleasures of eating certain foods should not be confused with the term "addiction". Humans naturally prefer the taste of sweetness. In fact, the preference for a sweet taste is present from birth; breastmilk is sweet due to its lactose content (Figure 1).

Enjoying foods, like other pleasurable activities such as exercising and laughing can stimulate a rewarding response in the brain. This response is not specific to sugars and is not the same as an addiction³. Evidence suggests sugar does not cause physical dependence or produce the effects of tolerance and withdrawal that is characteristic of an addictive substance³.

DID YOU KNOW?

The consumption of added sugars in Canada has been declining over the past two decades. Reducing sugars intake to a very low level may lead to certain nutrients being missed in the diet because entire food groups may be eliminated as sugars are found in small amounts in many different foods for taste and functionality. *Eating Well with Canada's Food Guide* recommends eating a variety of foods within the four food groups to ensure a balanced diet. Optimal health and weight management includes a balanced diet, moderation in portion size and overall food intake, adequate sleep, and regular physical activity.

Why are sugars added to foods?

Sugar has many roles in foods. Some of these are listed below⁴.

- Sugar acts as a natural preservative for jams and jellies by absorbing extra moisture to prevent bacterial growth;
- When exposed to heat, the browning reaction of sugar adds flavour and colour to bread crust and cookies;
- Sugar is used to keep baked goods moist and can delay staleness;
- Sugar feeds yeast in the fermentation that is part of bread-making;
- Sugar contributes to the light and fluffy texture of an angel food cake; and
- Sugar is responsible for the smoothness of frozen dairy products like ice cream.

A little bit of sugar can help make healthy foods taste better. Foods such as chocolate milk, flavoured yogurt, sweetened cereals, and grain products contain added sugars to improve taste and can help to deliver several essential nutrients (fibre, calcium, vitamin D, folate, etc.) to our bodies. This in turn helps us reach our daily nutrient requirements.

When food is made without sugar, other ingredients are added to achieve similar functions of texture, flavour, or colour. Often, sugar is replaced with starches, artificial sweeteners, or food additives that either have the same amount of Calories (e.g. starches) or require additional labelling on food packages (e.g. food additives).

DID YOU KNOW?

Food products making the claim “Reduced in Sugar”, “Lower in Sugar”, or “No Added Sugar” are not necessarily lower in total carbohydrates or Calories. It is important to look at the Nutrition Facts table to compare products and to understand the total Calories a food provides (Figure 2).

REFERENCES

1. Carbohydrates in Human Nutrition, Report of a Joint FAO/WHO Consultation, 1997
2. FAO. Food energy-methods of analysis and conversion factors. 2003.
3. Hebebrand J et al. *Neurosci Biobehav Rev.* 2014 Nov;47:295-306
4. Clarke M. *Int Sugar J.* 1997;99:114-126.
5. Wolever TMS. *Can J Diab.* 2002;26:356.

Figure 2. The Nutrition Facts table of two comparable packaged foods. The “No Sugar Added” Ice Cream has 60% less sugars, and is slightly higher in fat and total Calories as compared to the reference ice cream. Based on its Nutrition Label, this “No Sugar Added” Ice Cream is sweetened with a sugar alcohol (maltitol, 8 grams per ½ cup of ice cream).

Reference Ice Cream		“No Sugar Added” Ice Cream	
Nutrition Facts		Nutrition Facts	
Per ½ cup (125 mL)		Per ½ cup (125 mL)	
Amount	% Daily Value	Amount	% Daily Value
Calories 120		Calories 130	
Fat 5 g	9 %	Fat 10 g	15 %
Saturated 3 g + Trans 0.2 g	16 %	Saturated 3 g + Trans 0.2 g	16 %
Cholesterol 20 mg		Cholesterol 15 mg	
Sodium 65 mg	3 %	Sodium 75 mg	3 %
Carbohydrate 19 g	6 %	Carbohydrate 11 g	4 %
Fibre 1 g	4 %	Fibre 1 g	4 %
Sugars 14 g		Sugars 5 g	
Protein 1 g		Sugar Alcohol 8 g	
Vitamin A 8 %	Vitamin C 0 %	Protein 2 g	
Calcium 2 %	Iron 0 %	Vitamin A 4 %	Vitamin C 0 %
		Calcium 6 %	Iron 0 %

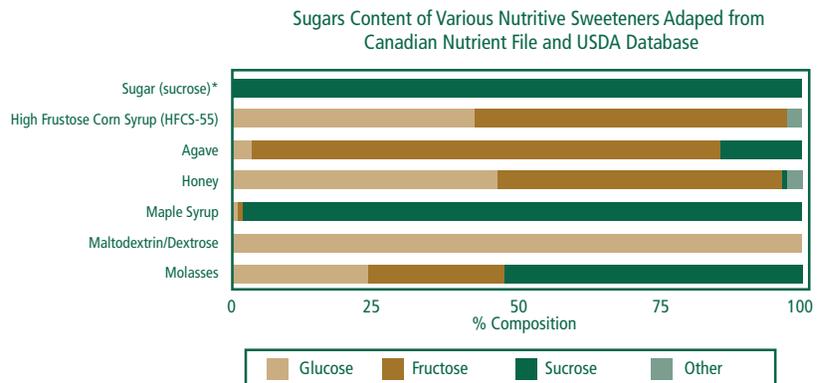
*Because naturally occurring and added sugars are chemically identical, the body cannot tell them apart. Therefore it is total sugars (includes both naturally occurring and added sugars) that is listed on the Nutrition Facts Table.

Sugar alcohols are not sugars or alcohol. They are carbohydrates with a chemical structure that partially resembles sugar and partially resembles alcohol. They have lower Calories than sugars ranging from 0-3 Calories/gram and are considered low-calorie sweeteners, often used in gum. Overconsumption of sugar alcohols may lead to a laxative effect or other intestinal symptoms in some people because they are not absorbed by the body.⁵

Is table sugar different than other sugars?

Honey, maple syrup, agave syrup and high fructose corn syrup are other sources of sugars that provide Calories. All are composed of glucose, fructose and/or sucrose in varying amounts (Figure 3), provide a similar amount of energy (approximately 4 Calories per gram), and contain insignificant amounts of vitamins and minerals. Although some may be used in baked products, they cannot perform all of sugar’s functions. For example, sugar prevents doughs from becoming rigid and tough. Sugar also serves as a whipping aid to keep beaten egg foams stable. These functions cannot simply be replaced by syrups.

Figure 3. Sugars content of various sweeteners



*Sucrose is composed of 50% glucose and 50% fructose

This fact sheet, developed with the collaboration of Registered Dietitians and Nutrition Researchers, is published by the Canadian Sugar Institute. If you have any questions about sugar and its relation to nutrition and health, feel free to contact:

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