

clips on sugars

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

Sugar From Plant to Food

Sucrose is a naturally occurring sugar (carbohydrate) in fruits and vegetables. All plants produce sucrose by photosynthesis, a natural process that turns sunlight into vital energy. Just as they play an essential role in the growth and life of plants, sucrose and other sugars are important sources of energy in our diet.

It is no coincidence that "sweet" is the first taste perceived by a newborn baby. The pleasure we experience in eating sweet-tasting foods is innate. Moreover, many scientists believe that our sense of sweetness helped our ancestors distinguish safe and energy producing foods from harmful foods since most toxic or spoiled foods tend to be bitter-tasting.

Although all fruits and vegetables contain sucrose in various amounts, on a commercial level the most practical sources of sucrose are sugar cane and sugar beet. The sugar-rich juice they contain is extracted and purified using two slightly different processes.

GRANULATED SUGAR IS NATURALLY WHITE - NO BLEACHING AGENT IS ADDED AT ANY TIME DURING THE PURIFICATION PROCESS

SUGAR PURIFICATION

Cane Sugar

Sugar cane is grown in tropical regions. After harvest, the sugar cane is transported to nearby processing mills where the sugar cane is cut up into small pieces and then crushed to extract the juice. Some impurities, such as plant fibre and soil, are removed from the juice. The juice is boiled down to thick syrup and tiny sugar crystals are added to start the crystallization process. Centrifugals act like large washing machines, spinning out the syrup and leaving behind raw sugar crystals. The raw sugar crystals are then shipped in bulk by sea to refinery warehouses across the world for the final purification process. In Canada, refineries are located in Montreal, Toronto and Vancouver.



According to Canadian food regulations, raw sugar must undergo purification before it is ready for human consumption. This is because raw sugar is covered with a thin coat of molasses, residual plant matter, and other impurities. The first step at the refinery is to remove these impurities. Sugar crystals are dissolved in water and filtered, leaving behind a clear golden coloured syrup, called liquor. The liquor is heated, producing thick syrup and tiny sugar crystals are added, allowing larger crystals to form. The mixture is spun in a centrifuge, separating the pure naturally white sugar crystals from the syrup. Finally, the pure sugar crystals are dried.

Beet Sugar

Sugar beets are grown and harvested in cooler climates such as the Canadian Prairies. Canada's sugar beet factory is located in

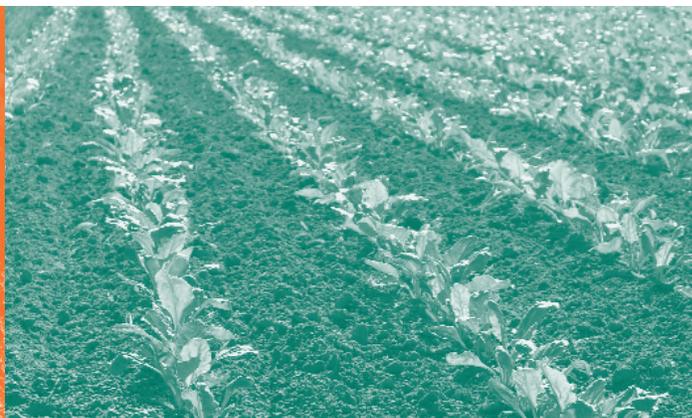
Taber, Alberta. Sugar beets are first sliced into thin strips, called *cossettes*, from which the raw sugar juice is extracted. The syrup is then purified, filtered, concentrated, crystallized, and dried, in much the same way as sugar cane. The refined sugar from beets is therefore exactly the same as sugar from cane.

The various stages of the sugar purification process allow for the production of different forms of sugar. Each has its own unique taste with specific and much appreciated uses.

Granulated sugar is another name for the white sugar crystals obtained from the purification process described above. Pure granulated sugar is naturally white - no bleaching agent is added at any time during the purification process.

Brown sugar is produced by blending pure white sugar crystals with small quantities of pure sugar syrups (molasses) selected for colour and taste.

Icing sugar is finely ground granulated sugar, to which a small amount of corn starch (gluten-free) is added to prevent caking (clumping).





NATURE'S WAY

Did you know that sugar beet and sugar cane are recycled after the sugar is extracted? Sugar cane residue, known as *bagasse*, is often used as fuel by the sugar mill itself. In fact, some mills generate their own electricity from bagasse and even supply power to neighbouring towns. Sugar beet pulp is used mostly in animal feed. The sugar beet leaves and tops may also be used as local livestock feed.

NUTRITION AND FOOD FOCUS

A nutrient for energy, and for the pleasure of eating well

Sugars play an important role in our diet. All sugars, such as those found in bananas, tomatoes or sugar cane, are pure carbohydrates and are the same nutrition-wise. Like all carbohydrates, sugars give us energy. Whether occurring naturally or added to foods, each gram of sugar supplies the body with 4 Calories of energy. Brown sugar, honey and maple syrup contain traces of other substances which give them their golden colour and characteristic taste, but their nutrient content is similar.

In addition to supplying carbohydrate and energy, sugars add flavour, colour, texture, and even help to preserve foods. By contributing to taste, sugars can help us enjoy nutritious foods that are important to our health. Many foods such as fruit, as well as our everyday recipes*, effectively combine sugars and essential nutrients, making foods more appetizing and satisfying.

Sugar not only help foods taste sweet, but also suppresses unpleasant bitter and sour tastes. When heated, sugar caramelizes, which enhances other flavours and also produces a golden brown color we enjoy in baked goods, such as the crust of bread.

Sugar contributes to the texture of foods in many ways. Sugar binds to water, keeping foods soft and moist. During baking, sugar crystallizes, enhancing the crispness of baked foods (e.g., ginger snap cookies). In frozen foods, such as ice cream, sugar helps lower the freezing point and ensures the development of fine crystals, which results in a smooth, soft product.

Finally, sugar helps to preserve foods. Sugar binds water, making it unavailable for microorganisms to grow. By reducing the water available for microorganisms, fewer preservatives are needed in products containing sugar compared to those without sugar.

*Check out our recipes at: www.sugar.ca/english/consumers/cookingwithsugar.cfm



CANADIAN SUGAR INSTITUTE AT WORK!

Aiming for quality is "standard" practice

Sugar, which is a common ingredient, is standardized and described in detail in Canada's Food and Drug Regulations. These standards, for example, state that sugar "shall contain not less than 99.8 per cent sucrose"; that brown sugar "shall be the food obtained from the syrups originating in the sugar refining process"; and that icing sugar may contain "not more than 5% starch" as an anti-caking agent.

For the Canadian Sugar Institute, these standards are important and so we work to ensure that the strict quality criteria for sugar is met by manufacturers. Canadian consumers can therefore count on high quality products.

MINI-QUIZ

Check out your "sugar knowledge" by identifying the following statements as either true or false (check the box below for correct answers).

1. All plants produce sucrose by photosynthesis.
2. Granulated sugar is bleached to make it white.
3. Sugar cane is grown and harvested in the Prairies.
4. Molasses is a by-product of sugar refining.
5. A tsp of honey, maple syrup, or table sugar each have the same number of calories.
6. The sugar produced from sugar cane and sugar beet is different.
7. There are 3 cane sugar refineries in Canada.

Answers to the Mini-quiz : 1-True, 2-False, 3-False, 4-True, 5-True, 6-False, 7-True

This fact sheet, developed with the collaboration of Registered Dietitians and Nutrition Researchers, is published by the Canadian Sugar Institute. For additional copies of this resource, please contact:

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