

How is sugar made from sugar cane?

From the sweeties.net wiki

Sugar cane is a tall perennial grass, 2 to 7 m high, with thick, jointed stalks rich in sucrose. It is native to New Guinea, and today it grows across the tropics and subtropics. Sugar cane accounts for 79 per cent of the sugar produced in the world, and most of the rest comes from sugar beet: see [how is sugar made from sugar beet?](#)

A mature stalk is roughly 63 to 73 per cent water, 11 to 16 per cent fibre and 12 to 16 per cent sugars.

Stage one: the mill

Cane has traditionally been processed in two stages. The first happens at a mill near the fields:

- The cane is crushed to extract its juice, leaving behind the dry fibre, called bagasse.
- The juice is boiled down and crystallised into raw sugar. Sulphur dioxide is added to stop colour forming and to steady the juice as it evaporates.
- The by products are put to use. Bagasse mostly fuels the mill's own boilers, and is also made into paper, board, mulch and chemicals. Molasses goes into food, animal feed, rum, ethanol and citric acid, and dried filter cake into animal feed and fertiliser.

Stage two: the refinery

Refineries are often near the people who eat the sugar, in Europe, North America and Japan. There the raw sugar goes through these steps:

1. **Affination.** The raw sugar is mixed with heavy syrup and spun in a centrifuge to wash off the outer coating of each crystal, which is less pure than the inside.
2. **Dissolve.** The sugar is dissolved to make a syrup of about 60 per cent solids.
3. **Clarify.** Calcium hydroxide, lime, is added with phosphoric acid or carbon dioxide. The solid that forms traps impurities and is skimmed or filtered off.
4. **Decolourise.** The syrup is filtered through activated carbon. Traditionally this was bone char or carbon made from coal.
5. **Crystallise.** The syrup is concentrated until it is supersaturated and crystallised again and again in a vacuum.
6. **Spin and dry.** A centrifuge separates the white crystals, which are dried in a rotary dryer and then cooled with air for several days so the grains do not clump.

The remaining syrup is crystallised again to make brown sugar, and the final molasses still holds 30 to 35 per cent sucrose.

Sugar cane in London

In the UK, Henry Tate's Thames Refinery opened in 1878 by the docks in East London. It refines raw cane sugar that arrives by ship, from mills such as Belize Sugar Industries and many others, and Tate and Lyle Sugars gives its capacity as 1.2 million tonnes a year. Tate and Lyle says all of its sugars are suitable for vegans except its Traditional Royal Icing Sugar, which contains egg white.

A bitter history

The earliest known production of crystalline sugar began in northern India. Columbus brought sugar cane to the Caribbean on his second voyage, and the first harvest was in Hispaniola in 1501. In colonial times sugar formed one side of the triangle trade, and work on the sugar plantations became a main basis of the Atlantic slave trade, supplying people to work under brutal coercion. After the Slavery Abolition Act of 1833 ended slavery through most of the British Empire, planters turned to indentured workers from India and China, often in abysmal conditions.

The harm has not ended. At least 20,000 people are estimated to have died of chronic kidney disease in Central America in two decades, most of them sugar cane workers, possibly because of long hours in the heat without enough to drink. In Maharashtra in India, sugar cane harvesting has been linked to forced labour through debt, child labour and pressure on women workers to have hysterectomies. For another sweet ingredient with a labour problem, see [child labour and the cocoa trade](#).

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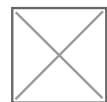
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