

Jaggery: A Natural Sweetener

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Gur or jaggery is a coarse, healthy, traditional, unrefined sugar that ranges in colour from golden yellow to dark brown and is made by condensing sugar juice. Under various names, it is produced in nearly 25 countries, with an estimated annual production of 14 million tonnes. With 58% of the global production, India is the leading producer of jaggery in the unorganised agro-processing industry, followed by Colombia, which contributes 12%. About 13.2% of India's total sugarcane production is used to make Khandasari, a concoction of Omolasses and crystalline sugar, and jaggery. Uttar Pradesh is the leading producer of jaggery from sugarcane among all Indian states. Jaggery and refined sugar are both sweeteners, but jaggery is considered a healthier alternative due to its nutrient content. Below is a comparison of their nutritional values per 100 gm.

Nutritive values of jaggery and sugar

Particular	Jaggery	Sugar
Sucrose (%)	65-85	99.5
Glucose, Fructose (%)	10-15	-
Proteins (%)	0.25	-
Fats	0.005	-
Calcium (%)	0.4	-
Phosphates (%)	0.045	-
Iron (mg)/100	11	-
Copper (mg/100g)	0.8	-
Total minerals	0.6-10	0.05
Moisture (%)	3.10-10	0.2-0.5
Energy (K.Cal)	3.83	3.98

Importance of Jaggery (Gur)

Jaggery is much more complex than sugar since it is made up of longer chains of sucrose. It provides energy gradually as opposed to quickly since it digests more slowly than sugar. This is good for the body and releases energy for a longer amount of time. However, as it is ultimately sugar diabetics cannot safely eat it. Since iron vessels are used to make jaggery, a sizable amount of ferrous salts (iron) are also produced during this process. This iron is particularly good for the health of people who are iron deficient or anaemic. Although jaggery leaves a little salty aftertaste on the tongue, it also contains trace amounts of mineral salts that are very beneficial to the body. These salts are present in sugar cane juice and are absorbed from the soil. Jaggery works well as a cleaning agent as well. Along with the stomach, intestines, and oesophagus, it also cleanses the respiratory system. Consuming jaggery is highly recommended for people who deal with dust on a daily basis. This can shield patients against conditions like asthma, cold or coughs, congestion in the chest, etc. Jaggery is well recognised for producing heat and giving the body instant vitality. As a result, greeting guests with a glass

of water and jaggery is customary in various parts of India. A part from these applications, jaggery is used to make cattle feed, medicine manufacturing facilities, distilleries, ayurvedic pharmaceuticals, ayurvedic supplements, and ayurvedic diets. At the moment, jaggery is becoming more and more popular as a candy. Workers in cement industries and coal mines are also given jaggery to help them avoid dust allergies. Additionally, following severe calamities, the district government purchases jaggery and distributes it to the victims as a health benefit.

Medical properties of jaggery

While jaggery and other traditional sweeteners are used worldwide, their popularity is highest in South Asia and Latin America. When water is extracted from date palm sap or sugarcane juice, a concentrated, raw sugar product is what is left over. Because of its high sugar content, jaggery should only be eaten in moderation, even though it has various biological properties and potential health benefits. Its biological traits and behaviours consist of the following: Jaggery contains essential elements including Fe, Mg, and K. The production of red blood cells and the maintenance of electrolyte equilibrium are just two of the fundamental bodily processes that rely on these minerals. Jaggery contains phytochemicals and polyphenols, which are antioxidants that may help reduce oxidative damage and reduce the likelihood of chronic disease development. Flavonoids, one of the components of jaggery, may have anti-inflammatory properties that help reduce inflammation in the body. Jaggery is claimed to help with digestion. By promoting the digestive enzymes, it can lessen indigestion, constipation, and bloating. In many traditional medicinal systems, jaggery is given for respiratory ailments like colds and coughing. It is said to calm the throat and reduce respiratory discomfort. Because of its iron concentration, jaggery may be used to treat or prevent iron-deficiency anaemia. Iron is necessary for the production of haemoglobin, the oxygen-carrying protein found in red blood cells. Certain women use jaggery because it is a naturally occurring source of carbohydrates that may help control hormone abnormalities.

Jaggery is claimed to help with digestion. By promoting the digestive enzymes, it can lessen indigestion, constipation, and bloating. In many traditional medicinal systems, jaggery is given for respiratory ailments like colds and coughing. Some women use it to improve menstrual symptoms like mood swings and stomach pains, and it is believed to reduce respiratory irritation. Jaggery has been applied topically to wounds in a number of traditional practices due to its potential antibacterial and wound-healing properties. Jaggery is commonly used to reduce the symptoms of coughs and colds when taken alongside other herbal remedies. It is said to have therapeutic benefits for respiratory health when paired with ginger and black pepper. A quick energy boost for athletes and high-energy people. It is usually favoured by necessities.

Jaggery purifies blood: When consistently ingested, jaggery aids in blood cleansing and leaves the body in a healthy state. A number of blood disorders and diseases can be avoided by raising haemoglobin levels. Additionally, jaggery boosts immunity, which helps to avoid a number of blood-related problems.

Iron concentration: Because it includes a substantial quantity of iron and folate, jaggery helps prevent anaemia. Jaggery powder also offers rapid energy, avoiding exhaustion and body weakness. When taken alongside meals that are high in vitamin C, jaggery enhances the body's capacity to absorb iron.

Mineral composition: Jaggery contains minerals and antioxidants, namely zinc and selenium, which help lower the risk of damage from free radicals. These minerals and antioxidants also help the body become more resistant to certain infections.

Cosmetic benefits: Jaggery has several natural properties that help to maintain the health of the skin for a very long time. It provides the skin with the nutrition it needs because of its high concentration of various minerals and vitamins.

Jaggery's impact on digestion: Jaggery speeds up the digestive process by encouraging the release of digestive enzymes. In addition to protecting against issues like gas, stomach parasites, and constipation, proper digestion also helps regulate bowel motions. This is highly beneficial for maintaining the proper operation of the digestive system. When the digestive

system functions flawlessly, intestinal issues are successfully avoided and dyspepsia is decreased.

Jaggery speeds up the metabolism: Jaggery's high potassium content and strong mineral content help in weight management. This aids by reducing the body's capacity to retain extra water. Jaggery's potassium boosts metabolism, maintains electrolyte balance, promotes muscle growth, and aids in weight loss.

Jaggery helps to balance hormones: Particularly for women who experience mood swings prior to their periods, jaggery has numerous beneficial advantages. The underlying reason of mood swings is the body's fluctuating hormone levels. Consuming jaggery causes the release of endorphins, which are feel-good hormones. This relaxes the body, which makes women feel better.

Improves brain function: Additionally, jaggery helps prevent serious issues with the body's nervous system. It has many inherent characteristics that support the healthy operation of the nervous system. This allows people to continue living their normal, healthy lives.

Treats respiratory issue system: Frequent jaggery consumption can protect against a number of respiratory disorders, such as asthma and bronchitis. Experts claim that a person's respiratory system benefits from consuming jaggery, a naturally occurring sweetness, in the right amount along with sesamum seeds. The properties of jaggery aid in regulating body temperature, which is very beneficial for those with asthma. Additionally, keep in mind that jaggery contains anti-allergy properties.

Processing of jaggery

The production of high-quality jaggery is mostly determined by the agronomic management techniques used in the production of sugarcane and jaggery. Agronomic methods include choosing a variety of cane, managing soil conditions, planting and fertiliser timing, irrigation schedules, crop protection against pests and diseases, harvesting cane, and post-harvest cane care. Selecting sugarcane genotypes with a high sucrose content is necessary to produce high-quality jaggery. Low-salinity, well-drained loamy soils are ideal for growing sugarcane, which yields high-quality jaggery. It is best to plant the crop between January and March and harvest it when it is at its most mature, depending on the variety. Because of delayed planting and crushing of immature or overmature cane used to prepare jaggery, lower quality and less recovery of jaggery will be obtained. N, P, and K fertilisers should be used as directed; too much nitrogen lowers the quantity and quality of jaggery. It is not advisable to expose the crop to either moisture stress or waterlogging. Before crushing to make high-quality jaggery, dead canes, water shoots, spoilt canes, and canes infested with rats should be thrown away. Harvesting the cane at the base of the clump requires caution because the lower part of the cane is high in sucrose. As soon as the cane is harvested, it should be crushed to extract the juice. Otherwise, the quality and recovery of the jaggery would deteriorate as the cane weight would decrease by roughly 5–8% and the juice would recover by 2% in 2–3 days. The opaque liquid sugarcane juice can range in colour from light yellow to dark green to grey, depending on the colour of the cane. It contains a number of soluble and insoluble contaminants, as well as mud, wax, and other nutritional components. Jaggery is a traditional unrefined sugar made from sugarcane or palm sap. The process of making jaggery involves several steps. First, fresh sugarcane is harvested and crushed to extract the juice. This juice is then filtered to remove impurities and is boiled in large, shallow pans over a fire. As the juice thickens, it is continuously stirred to prevent burning. During this process, impurities rise to the surface and are skimmed off. Once the juice reaches a thick, golden-brown consistency, it is poured into molds or left to cool and solidify into blocks. The final jaggery product is then packed and stored for consumption. Jaggery is widely used as a natural sweetener in various dishes and is known for its rich flavor and health benefits.

Conclusion

Jaggery, also referred to as "medicinal sugar," has numerous health benefits and can be used in pharmaceutical formulations as well as in daily life. One of India's oldest and most important

rural cottage industries, the jaggery industry is the country's largest unorganised sector. Enhancing high-quality and hygienic jaggery through the use of cutting-edge techniques, beginning with the extraction, cleaning, clarification, cooling, moulding, and packaging processes, is essential to the profitability of the jaggery industry. Using different sources to make different types of jaggery—solid, liquid, and granular—will also improve the quality of the produce. Herbal clarifiers are increasingly being used instead of pharmaceutical ones. Because of its lower moisture content and propensity to flow freely, granular jaggery has more benefits than lumped jaggery. However, the method has yet to be developed and made commercially available. Value-added jaggery has a considerable export potential and might command high market prices when nutritional additives are added. Improved quality through technological advancements in jaggery preparation, packaging, and added value can increase profits for growers and processors.