

Importance and Uses of Jaggery in different food item: A review

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Abstract

The Jaggery industries are grown in different parts of our country such as Andhra Pradesh, Bihar, Haryana, Karnataka, Punjab, Maharashtra, Tamil Nadu and Uttar Pradesh. Jaggery is sugarcane based natural sweetener made by the concentration of sugarcane juice. It is available in the form of semi-liquid form and in solid blocks. There are mainly three forms of Jaggery which are available in market i.e. solid jaggery, liquid jaggery and granular jaggery. In India, approximately 80 per cent of jaggery prepared is solid jaggery and remaining 20 per cent includes liquid and granular jaggery. The making of gur and khandsari by using different methods of converting sugarcane and manufacturing sugar, both are different but a great value is added in the manufacturing of these consumable final products. Many micronutrients are present in Jaggery has many nutritional and medicinal aspects like its anti-carcinogenic and antitoxic activity. There was 29 food items prepared with jaggery, vegetables, kheer, modak, chikki, churmura, laddoo, gud amba, chunda and other foods and also use jaggery in prepared of dal usal, groundnut laddoo, sweet poha, sweet rice, Gud poli, Gud puriaamras, karanji, Gud papdi, drink laddoo, sweet bhaji and gulamba, methi, laddoo, puranpoli, sheera, khaja, malpua, kayri panna, sweet pickle, chunda dal and value added with different natural flavour. Furthermore it offers for employment of best opportunity to millions of people and Jaggery is known to produce heat and give instant energy to a human body.

Index word: Jaggery; jaggery products Sugarcane; Value addition; Packaging; Storage

INTRODUCTION

Sugarcane, member of grass family, has potential to grow up to 4.5m high under tropical conditions (Yadiraet *al.*, 2005). Sugarcane which belongs to the genus *Saccharum* has six species namely *S. officinarum*, *S. barberi*, *S. sinense*, *S. robustum*, *S. spontaneum* and *S. elude* (Verma, 2004).

Jaggery is a complex than sugar and it is made up of longer chains of sucrose. Hence, it is digested slower than sugar and releases energy slowly. This provides energy for a longer time and is not harmful for the body. Different benefits of jaggery powder are listed as follows:

1. Rich in mineral salts
2. Easy to digest
3. Develops unique taste as sweetener
4. Treats throat and lung infections
5. Easily dissolved and balances the deficiency of sugar level
6. Sulphur less Organic Composition, a best to suite as preferred health alternative
7. As a cathele feed, in distillery medicine manufacturing unit.
Has also found a place in confectionary items.
8. Used in leather and tobacco industries
9. Used in cement industry and coalmines

1. COMPOSITION OF JAGGERY

Jaggery is made up of sucrose, with traces of minerals, salts, iron and some fiber. Jaggery is rich in iron and thus is highly recommended for anemic people. It also contains many minerals such as Magnesium, Potassium, Calcium, Selenium, Manganese and Zinc. Table 1. Showed that composition of different forms of jaggery.

Table1

Composition of different forms of Jaggery			
Composition per 100g	Solid	Liquid	Granular
Water(g)	3-10	30-35	1-2
Sucrose(g)	65-85	40-60	80-90
Reducing Sugar(g)	9-15	15-25	5-9
Protein(g)	0.4	0.5	0.4
Fat(g)	0.1	0.1	0.1
Total mineral(g)	0.6-1.0	0.75	0.6-1.0
Calcium(mg)	8.0	300	9.0
Phosphorous(mg)	4.0	3.0	4.0
Iron(mg)	11.4	8.5-11	12
Calorific value(kcal)	383	300	383

Source: (Jaswant Singh 1998, Rao et al; 2007)

2. NUTRITIONAL VALUE OF JAGGERY

Jaggery is rich in minerals (Calcium-40-100 mg, Copper-0.1-0.9 mg, and Chloride-5.3 mg per 100 g, Iron-10-13 mg, Magnesium-70-90 mg, Manganese-0.2-0.5 mg, Potassium-1056 mg, Phosphorus-20-90 mg, Sodium-19-30 mg, Zinc-0.2- 0.4 mg of jaggery), vitamins (viz., Vitamin A-3.8 mg, Vitamin B1-0.01 mg, Vitamin B2- 0.06 mg, Vitamin B5-0.01 mg, Vitamin B6-0.01 mg, Vitamin C-7.00 mg, Vitamin D2-6.50 mg, Vitamin E-111.30 mg) and protein-280 mg per 100 g of jaggery, that nutrients to combat the malnutrition. The micronutrients present in the jaggery possess antitoxic and anti-carcinogenic properties. It has moderate amount of calcium, phosphorous and zinc, so it helps to optimum health of a person along with all its benefits, purifies the blood and prevents rheumatic afflictions and bile disorders and thus helps to cure jaundice.

3. BIO-AVAILABILITY

Percent Daily Values (%DV) are for adults or children aged 4 or older, and are based on a 2,000 calorie reference diet. your daily values may be higher or lower based on your individual needs. Nutrition Data's opinions and ratings are based on weighted averages of the nutrient densities of those nutrients for which the FDA has established Daily Values, and do not consider other nutrients that may be important to your health or take into account your individual needs. Consequently, Nutrition Data's higher-rated foods may not necessarily be healthier for you than lower-rated ones. All foods, regardless of their rating, have the potential to play an important role in your diet.

4. TYPES OF JAGGERY

4.1 Solid jaggery (Cube shape)

The filtered cane juice was pumped into open pans kept on triple pan furnace and heated with the bagasse as fuel. The cane juice was clarified with herbal clarificant like deola extract @ 45 g/100 kg juice to make light coloured jaggery by eliminating impurities suspension, colloidal and colouring compounds by accumulation. The cane juice was boiled and then concentrated to make jaggery in desired shape and size (Singh 2011 and Priyanka 2016)

4.2 Liquid jaggery

During Jaggery making obtained product by concentration of purified sugarcane juice and semi liquid syrup. The quality of liquid jaggery largely depends upon the quality, composition of cane juice, type of clarificants used and temperature at which concentrating juice is collected. the sugar cane juice concentrate is removed from boiling pan for quality of liquid jaggery, when it reaches at temperature of 103-106°C, depending upon the variety and agro-climatic zone. To avoid crystallization and to make liquid jaggery attractive in colour, citric acid is added at 0.04% (400 mg/kg of liquid jaggery), whereas to improve shelf life of liquid

jaggery without deterioration in quality, potassium metabisulphite @ 0.1% (1 g/ kg of liquid jaggery), or Benzoic acid @ 0.5% (5 g/kg of liquid jaggery), is added. Liquid jaggery is settle to for a period of 8-10 days at ambient conditions. After filtration, it is properly packed in sterilized bottles. Chemical composition of liquid jaggery showed as following,

Water 30-36%, Sucrose 40-60%, Invert sugar 15-25%, Calcium 0.30%, Iron 8.5-10 mg/100 mg, Phosphorus 05/100 mg, Protein 0.10/100 mg, and Vitamin B 14/100 mg. (Singh 2008; Singh 2013; Priyanka 2016)

4.3 Granular or Powder Jaggery

The concentrating slurry is rubbed with wooden scrapper, for formation of grains this process of making granular jaggery is similar up to concentration. The granular jaggery is cooled and then sieved. Less than 3 mm sized crystals are found to be better for quality granular jaggery. Raising of pH of cane juice with lime, up to 6.0-6.2, and striking point temperature of 120°C was found to yield quality granular jaggery with high sucrose content of 88.6%, low moisture of 1.65%, with good colour, friability and crystallinity. Jaggery in the form of granules (sieved to about 3 mm), sun dried and moisture content reduced to less than 2%, and packed in polyethylene polyester bags or polyethylene bottles, can be stored for longer time (more than two years), even during monsoon period with little changes in quality (Anonymous;2014 and Priyanka 2016). Colour of jaggery powder can range from golden yellow to golden brown dark brown like dark chocolate. The colour is often dependent on base ingredient used to make jaggery powder. It is softer than sugar and also amorphous. This is because vitamins proteins and in gradient of cane are not removed. It is made up of predominantly sucrose mineral salts iron. Hence consumption of jaggery is recommended in case of iron deficiency anaemia. It contains longer chains of sucrose therefore it is digested slowly and energy release is also slow.

5. VALUE ADDITION IN JAGGERY

Jaggery is a value added with different natural flavours (ginger, black pepper, cardamom etc.), nutrition (protein, vitamins, minerals and phytochemical), texture (additives) and taste (additives like nuts, spices, cereal and pulses). Different value added products are prepared traditionally using jaggery instead of sugar viz., rosagolla, peda, curd, laddu (puffed cereal, nuts and sesame etc.) Anwar et al., 2011 was developed a vitamin C enrich jaggery powder by adding through a natural source like cut pieces of amla fruits and dried up to 10% moisture content was found to be the best, followed by samples with grated and fine powder form of amla, as indicated through sensory evaluation. Vitamin C is an important constituent of our daily diet and it is important in forming collagen, a protein that gives structure to bones, cartilage, muscle and blood vessels. Mixing was better in fine powder form, but the colour of jaggery is affected, and the taste also becomes uniformly sour. Jaggery samples in which dried Amla was mixed in coarse powder form was found to be the best, followed by samples with grated and fine powder form of Amla, judges by sensory evaluation. Other uses like jaggery toffees and jaggery cake made with pumpkin preserve, cashew nuts, pea nuts and spices. Jaggery may also be used in the alcoholic beverages like palm wine.

6. USES OF JAGGERY IN DIFFERENT STATES

6.1 Jaggery with pulses

Jaggery is used as an ingredient in sweet and savoury dishes in the cuisine of India, Pakistan, Bangladesh, Nepal, Sri Lanka,, Afghanistan and Iran for example, a pinch of its. Sometimes added to Shambhar, rasam and other staples. Jaggery is added to lentil soups (to add sweetness to balance the spicy, salty and sour components particularly in gujrati cuisine)

6.2 Jaggery with and millets

In Gujarat, ladooes are made from wheat flour and jaggery, In Andhra Pradesh, it is used for sweets like Chakkara Pongal, milk Pongal (prepared with rice, milk jaggery). In Odia cuisine, cakes or pithas (rice flour or wheat flour with jaggery). Guda is also added to rice flakes called chuda and eaten as breakfast.

6.3 Oilseed with Jaggery

Jaggery toffees and jaggery cake made with pumpkin preserve, cashew nuts, peanuts and spices, sesame and jaggery both during winter season. The sweet is a mixture of sesame seeds called Til in (marathi/Hindi).hence, in many Gujjarati communities, engagement is commonly known as goldhana literally jaggery and cariaander seeds.

6.4 Jaggery in Beverage

Jaggery may be used in the alcoholic beverages such as wine. Besides being a food, Jaggery may be used (mixed in an emulsion with butter milk and mustard oil) to season the inside of tandoor ovens Burmese cuisine in Myanmar dish. Burmese cuisine is known by the extensive use of fish products like fish sauce Molasses by product of the production of jaggery production of jaggery is used in rural maharashtra, and karnataka as a sweetner. It contains many minerals.

7. Packaging and storage life of jaggery

In India, the traditional methods of jaggery storage prevalent in western and eastern regions like open storage, matka, gunny bags etc. These methods don't work in Tarai regions because climatic conditions are not favourable for keeping quality of jaggery as there is very high humidity in these areas. When during monsoon period then due to high humidity range, and jaggery samples get infected with microbial activity and also keeping quality of jaggery goes down. Jaggery samples could be stored in cold storage. Jaggery is a good source of the energy. If storage of Jaggery in cold condition so it's used off-season at high cost.

CONCLUSION

Availability of fresh and nutritious food is very difficult so use Jaggery in different forms, rich in minerals, vitamins and antioxidants taken as health supplement. Our lifestyle has become very fast and necessary nutritional requirements to health so Jaggery is improving the suffering under nutrition, and/or malnutrition, because of deficient common diet and probably, may replace sugar in making of health foods.

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