FAQ- Jaggery quality

1. What is the composition of cane jaggery?

The jaggery contains approximately 60-85% sucrose, 5-15% glucose and fructose. Along with 0.4% of protein, 0.1 g of fat and 0.6 to 1.0 g of minerals (8 mg of calcium, 4 mg of phosphorus, and 11.4 mg of iron). It is also found to contain traces of vitamins and amino acids. 100 g of jaggery gives 383 kcal of energy. In ayurveda, jaggery is considered as the best base material for the preparation of medicines. In contrast, the white crystal sugar contains only sucrose to the tune of 99.5% without any minerals.

2. What is an ideal juice clarificant for jaggery making?

The clarificant should meet the following requirements:
- Removal of all constituents of juice other than sucrose, reducing sugars, inorganics (phosphates, iron and calcium) and organics (higher proteins and fats).
- Control of undesirable colour development and inversion of sucrose during boiling and concentration.
- Better crystallization.
- Prevention of overheating and charring.
- No adverse effect on jaggery taste and human health.
- Longer storage life of the product.
- Easy availability of clarifying agent.

3. What are the various vegetable clarificants that are used for jaggery making?

Stem and root of green plant of Deola and Bhindi, Green bark of the Phalsa and Semul trees, Dry bark of the Sukhlai plant, Seeds of castor, ground nut and soybean. The quantity of clarificant is approximately 40 - 70 g per 100 Litres of cane juice.

4. What are the various chemical clarificants that are used for jaggery making?

Hydros (sodium hydrogen sulphite), Lime (Calcium oxide), Sodium carbonate, Sodiumbicarbonate, Sajji (50%) sodium carbonate, 6.4% sodium sulphate, 4.5% sodium chloride), Super phosphate and alum are used. Use of various chemicals as juice clarificants during jaggery preparation results in presence of harmful chemicals like S0₂ in jaggery and also affects the taste and storability of such jaggery.

5. What are the varieties good for jaggery making?

Andhra Pradesh: Co 6907, CoT 8201, Co 8013, Co 62175, Co 7219, Co 8014, CoR 8001
Bihar: CoS 767, BO 91, Co 1148
Gujarat: CoC 671, Co 7527, Co 62175, Co 8014, Co 740
Haryana: Co7717, Co 1148, Co 1158, CoS 767
Karnataka: Co 7704, Co 62175, Co 8014, Co 62175
Madhya Pradesh: Co 775, Co 7314, Co 6304, Co 62175
Maharashtra: Co 757, Co 7219, CoC 671, Co 740, Co 7527, Co 86032
Orissa: Co 7704, Co 7219, Co 62175, Co 6304
Punjab: Co 64, Co 1148, Co 81
Rajasthan: 997, Co 419
Tamilnadu: CoC 671, Co 62175, Co 7704, Co 6304, Co 8021, Co 86032, CoC 92061
Uttar Pradesh: CoS 687, CoJ 64, Co 1148, CoS 767, CoS 802, CoS 7918, Co 1158, CoS 8408,
6. What are the methods of jaggery storage?

The following methods may be adopted for the storage of jaggery without much deterioration in quality:

- Large quantities of jaggery may be stored in the godowns provided with moisture absorbing agents like calcium chloride or quick lime.
- Use sugarcane trash, fly ash, palmirah leaves, paddy husk etc, in between layers of jaggery.
- Smoking of godown with paddy husk particularly during monsoon period.
- Storing of jaggery under low temperature maintains freshness in flavour and no loss in sucrose content.
- Storing of jaggery in gunny lined with black polythene sheets.
- Drying of gur in shade during summer to a moisture content of less than 6% and storage of dried gur in polythene lined gunny bags improves shelf life of jaggery.
- Ordinary earthen pots painted from inside as well as outside, wooden boxes, baskets made of palmirah leaves can be used for storing jaggery at home.

7. What are the standard specifications for cane jaggery grading?

<table>
<thead>
<tr>
<th>S.No</th>
<th>Characteristics</th>
<th>Grade-1</th>
<th>Grade-2</th>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td>Sucrose % (minimum)</td>
<td>80</td>
<td>70</td>
</tr>
<tr>
<td>2.</td>
<td>Reducing sugars % (maximum)</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>3.</td>
<td>Moisture % (maximum)</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>4.</td>
<td>Water insoluble matter % (maximum)</td>
<td>1.5</td>
<td>2.0</td>
</tr>
<tr>
<td>5.</td>
<td>Sulphated ash % (maximum)</td>
<td>3.5</td>
<td>5.0</td>
</tr>
<tr>
<td>6.</td>
<td>Sulphur dioxide ppm (maximum)</td>
<td>50</td>
<td>80</td>
</tr>
<tr>
<td>7.</td>
<td>Ash insoluble in dilute HC (maximum)</td>
<td>0.3</td>
<td>0.3</td>
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</tbody>
</table>

Source: Indian Standard (IS 12923):1990

8. How to make organic jaggery?

Many times the market jaggery has been found to contain excess quantities of harmful chemicals like sulphur dioxide. Due to use of chemicals the taste and storability of such jaggery is also affected. In this context growing of sugarcane naturally and with use of organics and also preparation of jaggery with use of organic clarificants assumes importance in order to produce quality jaggery. There is a growing demand for organically produced jaggery both within the country and in the export market. For preparation of organic jaggery, the sugarcane should be grown in a field free from any residue of chemical fertilizers, herbicides, pesticides etc. from the previous crop. Follow all the recommended techniques for growing the sugarcane by applying only organic source of required nutrients, totally avoiding pesticides and herbicides. For controlling the pest, bio-control methods may be adopted.

9. How to prepare liquid jaggery?

Liquid jaggery is an intermediate product obtained during jaggery making. This contains water, sugars, and non-sugars. Fructose and glucose are in equal proportions, with proteins, organic acids, and minerals. After the juice is extracted, potassium alum crystals added to the juice. This facilitates sedimentation of solid particles. The clear juice is poured into a boiling pan. About 50 g of lime is added to bring the pH to 6.0. Bhendi (ladies finger) mucilage is added and the first scum is removed when the temperature is 85°C. Chemical clarificants include phosphoric acid and super phosphate. Boiling is continued and the second scum is removed at 98°C. The strike point is 106°C and at this stage the pan is removed and 0.04% of citric acid is added. Liquid jaggery is sweeter than cane sugar and jaggery. After complete settling, liquid jaggery is filled in clean and sterilized bottles. This can be stored for 1-1.5 years. It is necessary to add 0.1% citric acid and 0.1% sodium metabisulphite for better preservation.

10. What is value added jaggery?

Value addition to solid jaggery by inclusion of nutritive substances through puffed rice, gram, sesame and various kinds of nuts (cashew, almond), vitamins, iron, and taste enhancers like chocolate powder will increase demand for this kind of jaggery. The nutritive value and palatability can be enhanced by preparing different kinds of jaggery with the addition of puffed rice, gram and groundnut in different...
proportions of 1:0.75, 1:1, 1:1.25, 1:1.5, 1:1.75 (Jaggery patti), mixing with wheat flour in proportions 90:10, 80:20, 70:30, 60:40, 50:50 and 40:60 (Jaggery-wheat flour extruded snacks) and mixing with gram flour (Jaggery-besan snacks). The jaggery with 10% cocoa powder yielded a product (chocolate) which was very much acceptable as a substitute for chocolate. Value added jaggery will be a cheap source of nutrition to the poor and malnourished.