

Jaggery a Unique Sweetening Agent Used in Hotel Industry in the Region of Kolhapur

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Abstract

Jaggery is the traditional sweetener in the organic form of sugarcane extract, the references are found from the Vedic era where it is documented to be used as a medicinal and sweetening agent in Indian Kitchens. Similarly, Jaggery extends its importance in South American cuisines and other Asian cuisines as sugarcane production is comparatively good in these regions. Western Maharashtra is known for sugarcane production. Kolhapur being the hub of sugarcane processing and the sugar manufacturers centre for Maharashtra. The Jaggery production and jaggery research centre in Kolhapur takes many efforts to promote its awareness and importance. This study focuses the culinary uses of jaggery and its preference by Chefs fraternity of Kolhapur. The study emphasized out the health benefits of Jaggery, which can be protected even after cooking. Further, study includes the comparison between the sugar and Jaggery preference by chefs for colour, consistency and health benefits.

Keywords: Jaggery, Sweetening-Agent, Sugarcane-Extract

INTRODUCTION

Jaggery is a traditional solid mass obtained from sugar cane juice consumed in India. It is a concentrated sugarcane juice. Some parts of India, Produce jaggery using sap of Palm and Date tree. The separation of the molasses and mass of jaggery results in golden brown to dark brown coloured jaggery as a product. It contains sucrose, inverted sugars, and moisture as sugar is hydroscopic in nature, with the residue which includes wood ash, proteins, and bagasse fibres.

Jaggery is made of sugarcane and the palm tree. The sugar made from the date palm tree sap is highly prized and

rarely available because the process is tedious. The toddy syrup from palm tree sap is tapped for producing jaggery in mostly, Pakistan, Bangladesh, Sri Lanka, and India

In past, crushers were used by sugarcane cultivators that were not always powered, but all modern crushers are power-driven. These crushers are placed in fields of the sugarcane. Sugarcane is crushed and the extract is collected in a vessel. Then enough quantity of the juice is transferred to a smaller vessel for heating.

The vessel is heated and once the sugarcane juice is boiling the lime juice needs to be added to clarify the impurities which floats on the top of the juice which needs to be removed. Finally, the juice is thickened. The resulting thick liquid is one-third of the original sugar cane juice volume.

This hot liquid is golden in colour. It is stirred continuously to observe whether it forms a thread. After forming many threads and completely thickened, later poured into a shallow pan to cool and solidify. The pan is large enough for the liquid to form a coat at the base of the pan after heating. After cooling, the jaggery becomes soft which is moulded into the desired shape. The quality of jaggery is evaluated by the final colour, if the jaggery is brown it contains more impurities and golden colour is considered significantly pure. This discrepancies in jaggery colour encourages the usage of bleaching agents and colouring adulterants are sometimes added to jaggery to simulate the golden hue.

It is most widely used in India. The sources from Historians claim that jaggery was introduced to India by the Portuguese. The Hindi term for jaggery is “Gud” and the Indians believe that Ayurveda is been advocating use of jaggery for the last 3,000 years, as mentioned in the old archived granthas.

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OBJECTIVE

- To study production process of Jaggery in Kolhapur-Case Study.
- To identify the uses of Jaggery in hotel industry and its health benefits.
- To study preferences of Jaggery by Chefs.

NUTRITIONAL VALUE OF JAGGERY

- The good quality Jaggery has more than 70% sucrose and others should be less than 10% of glucose and fructose, 5% minerals 3% moisture.
- It is rich in important minerals like Calcium, Magnesium, Potassium, Phosphorus, Sodium, Iron, Manganese, Zinc, Copper, and Chloride.
- It is also rich in vitamins such as Vitamin A, Vitamin B1, Vitamin B2, Vitamin B5, Vitamin B6, Vitamin C, Vitamin D2, Vitamin E.
- The amount of protein content, which is present in the Jaggery, should be easily available to the people so that they can reduce the problems of malnutrition and under nutrition.
- Health benefits of jaggery are much higher than sugar, as it is made up of longer chains of sucrose. It is heavy for digestion than sugar and provides energy slowly and instantly. The energy provided through Jaggery is retained in a body for longer time.
- Jaggery also has considerable number of ferrous salts (iron) which are included or absorbed during its preparation in iron vessels. Hence, Jaggery contains enough amount of iron which is also good for health.
- Jaggery also contains very small amount of mineral salts which are beneficial for the body. These salts come from the soil where sugarcane is produced.
- Those who work in dust every day need to consume jaggery in small amount everyday. This will help to treat or limit the repercussions of asthma, chest congestion, cold, cough etc.

HEALTH BENEFITS OF JAGGERY

- The health benefits of jaggery and the nutritive value of jaggery is been proved in numerous research.
- In this survey it was found that majority of the people use sugar daily as compared to jaggery because

of the convenience and clarity, it is also neutral in taste whereas Jaggery imparts colour and flavor to the product hence there are new byproducts of jaggery are created recently like jaggery powder which dissolves easily and imparts less flavour.

- Jaggery is mostly used during festivals or special occasions. However, many of the users prefer jaggery over sugar.
- Jaggery is preferred in Maharashtra more than any state because some of them found it to be sweeter than sugar, whereas for some it imparts a nice taste to the recipe.
- Consumers do not find using jaggery daily as practical and convenient. Examples like sugar in tea, desserts etc. colour as a major criterion for the selection of jaggery followed by shape and texture.
- People assume that jaggery is impure comparing to sugar so the preference is given to sugar than jaggery.
- Jaggery is mostly adulterated with calcium carbonate to improve colour.
- Sodium bicarbonate is also added sometimes to give a whiter look. Yellow colour is added if the jaggery gets too white. This may be harmful as these are not edible colour.
- Different benefits of jaggery are listed as:
 - Rich in mineral salts.
 - Easy to digest.
 - Unique taste as sweetener.
 - Treats throat and lung infections.
 - Sulphur which has less Organic Composition, a best to suit as preferred health alternative.

CASE STUDY ON JAGGERY PRODUCTION PROCESS IN THE REGION OF KOLHAPUR (KAGAL)

Following are the 3 Main processes of organic jaggery production

- Removal of Juice
- Clarification of Juice
- Concentration of Juice

EXTRACTION OF JUICE

3 roller mills are used for sugarcane juice extraction. It works on electrical motor or diesel engine. This extraction process of juice is quiet time consuming and gives 60 to 70% yield. After extraction of juice, pending residues are removed by straining through muslin cloth or fine mesh strainer.



Fig. 1: Extraction of Juice from Sugarcane

CLARIFICATION OF JUICE

The sugarcane juice contains impurities, inorganic salts, fibre, various nitrogenous substances, lipids, gums, wax organic acid, inorganic acid, pectin etc. All these impurities are either removed totally or partially in this clarification process.

In this process either Organic clarifying agents or Inorganic Clarifying agents are used for clarification. The organic clarifying agents are obtained from vegetable like

Bendi, Sulkali and Doela. Inorganic agents are like Lime, Hydrous Power, and super phosphate.

The extracted sugarcane juice which is heated is termed as mass. Then the entire mass is transferred to the shallow bottom pans and it is heated slowly to remove trapped air and convert the mass into gummy or sticky substance, colloidal substances coagulate by the clarificants as per requirement. The scum which are the floating impurities on the surface, which is removed time to time.

First the organic clarifying agents are added simultaneously small quantity of limewater is added to reduce the acidity of juice. In this lime process pH maintained between the range of 6.2 to 6.5. Most of the times, super phosphate, and concentrated hydrous power is added for the better colour.

CONCENTRATION OF JUICE

After continuous boiling completes clarification, temperature of boiling liquid is maintained at 110° to 115°. Boiling take place about 2 to 3 hours. In this process the semi fluid liquid is cooled down to get solid form of jaggery.

COMPOSITION AND SPECIFICATION OF JAGGERY

It contains all the nutrients present in sugarcane juice. The nutritional value of jaggery is slightly higher than that of crystalline sugar. Jaggery is usually graded according to colour, taste, hardness, and visual appearance.



Fig. 2: Jaggery Concentration Process Done in a Traditional House of Mr. J. Jadhav, Local Jaggery Producer, Kagal (Kolhapur)

STORAGE OF JAGGERY

Jaggery is consumed throughout the year. The jaggery gets spoiled fast during Monsoon as the humidity in the air is high to avoid this problem of moisture absorption Jaggery is packed in plastics bags or jute bags.

LITERATURE REVIEW

Dasappa (2018) has studied the usage of Jaggery and replacing sugar in muffins with the pasting properties of wheat flour, and storage characteristics of muffins. Jaggery (Gur) is a natural sweetener made using concentrated sugarcane juice, contains all minerals and vitamins found in sugarcane juice. Varied amounts of eggs such as 42%, 63% and 84% were also used for jaggery muffins. The results indicated that muffins prepared with 84% each of jaggery and eggs has acceptable quality standards. Comparing Jaggery with sugar on the for the sticky characteristic of wheat flour, sensory and storage for muffins were studied. The Jaggery containing muffins had lower pH value, overall quality Despite the fact that the muffins made with jaggery were less soft, also showed lower overall quality score than the sugar muffins. Muffins made with jaggery were approved by the evaluators and both the category of muffins were microbiologically safe. Therefore the researcher concluded that jaggery can replace sugar in muffins without disturbing the properties of the product.

Rahul Verma by The Hindu Times (2019) mentioned in article Sweet January; everything made with jaggery tastes much better than sugar as per the researcher. He quoted in his article that gud is being his favorite dessert since childhood. The regional people of Uttar Pradesh still prefer only roti and gud as a complete meal. These desserts made creates a mark in the tourists mind especially in winter, when people celebrate festivals with jaggery. This can be compared with Liquid gold. In the month of January (Gur) Jaggery is used in all kinds of Indian sweets. When year begins with festival of harvest: Makar Sankranti, Lohri, Pongal, Sankranti are various names of this festival region wise. In Maharashtra, Makar Sankranti is celebrated with sesame and jaggery.

VK Jagannadha Rao and Das (January 2007) mentioned in their research, Jaggery - A traditional Indian sweetener Jaggery is the sugarcane based traditional

Indian sweetener. At present, 24.5% of the sugarcane produced in India is being used for production of jaggery. Jaggery is easily available to rural people for nutritious convenient, reasonable as compared to sugar, it requires low capital investment in production and is manufactured at the farmer's individual units itself. 70% of worlds Jaggery production is done in India. Jaggery is easy to store, transport and very convenient for cooking also has medicinal importance.

Regional Sugarcane and Jaggery Research Station, Kolhapur - The center has recommended techniques and advances in Jaggery Processing: A review Pawar, Jadhav and Nimbalkar (2017) mentioned-Jaggery is a natural sweetener made by concentrating the sugarcane juice. Jaggery production is affected by various factors from cultivation to the manufacturing process. The jaggery trade and industry is still at nascent level reason being some of the technological drawbacks with respect to quality of processing export and storage. Jaggery with additional nutritive ingredients considered as export potential successively turning good market prices. The jaggery free for chemicals is gaining popularity in the market because of its benefits towards health and containing great quality attributes, therefore herbal clarificants play an important role in jaggery production.

Imtiaz (2021, April) mentioned in the article Jaggery: South Asia's sweet, sentimental cure-all. Jaggery is more than a local medicinal food or a delicious dessert. It is considered by millennia the concentrated essence of old tradition. Jaggery is our traditional treasure chest, which is full of nutrients. The flavor of Jaggery adds to both sweet and savory South Asian dishes.

RESEARCH METHODOLOGY AND DATA COLLECTION

Primary Data

- Survey is done using questionnaire and personal interviews of chefs and kitchen professionals of Kolhapur. The responses were collected from chefs of various hotels, restaurants & catering outlets of Kolhapur.
- Observation: The visit was made to local Jaggery production factory to gain an insight of jaggery production process.

Secondary Data

Internet, Books, Journals, Newspaper, websites and published news articles.

SAMPLING TECHNIQUE

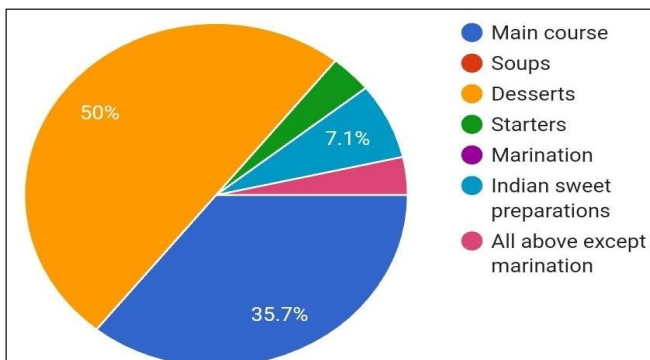
- *Sample Size:* Population of 32 chefs & 37 kitchen professionals associated with restaurants and catering outlets of Kolhapur. Total sample size of 69 respondents is studied for this research.
- *Sampling:* Random Sampling method is considered for this research.

DATA ANALYSIS



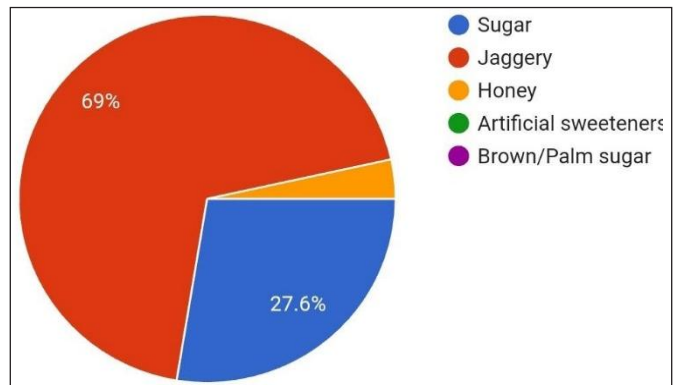
As per data received 86% of chefs and kitchen professionals uses Jaggery while preparing food. As it has lot of nutritional and health advantages, according to the research the use of Jaggery is also helpful for maintaining the low food cost as well.

Usage of Jaggery in:



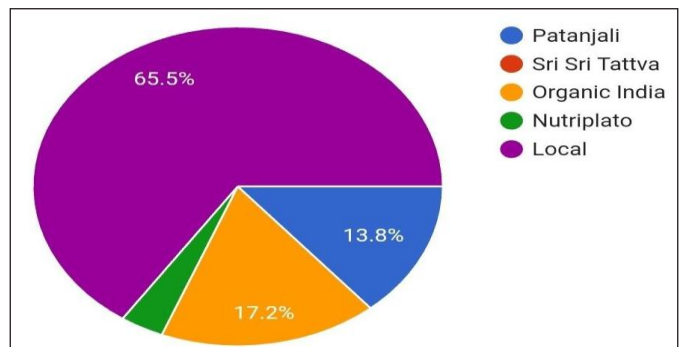
As per survey jaggery is mostly used in desserts, main course, Indian sweet preparation. 50% chefs use jaggery in desserts and 35.7% in main course preparations. This survey was carried out in most popular hotels, restaurants and catering outlets of Kolhapur. It shows that it is a popular sweetening ingredient in the region of Kolhapur for various reasons like good colour, consistency and it also gives good shelf life.

Preference of Sweetener while Cooking the Food

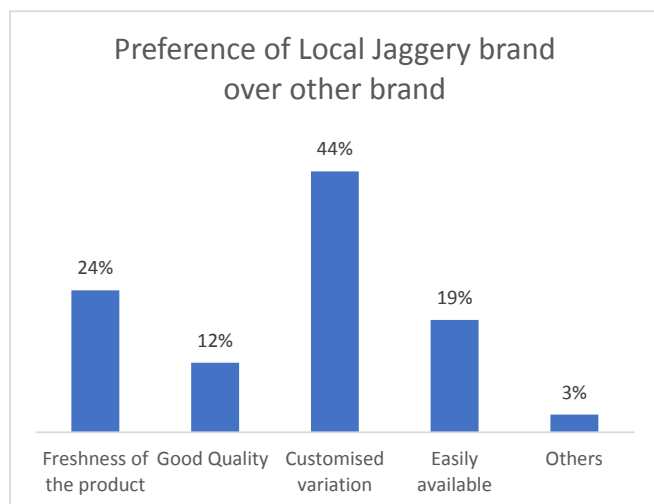


As per survey 69% of Chefs uses Jaggery as sweetener while cooking food. In the region of Kolhapur as the availability and local consumers preference is always towards the jaggery. Even the jaggery research center in Kolhapur takes efforts to create awareness for the use of jaggery it is eco-friendly; economical option and health benefits are good.

Preference of Jaggery Brand:



As per survey 65.5% of Chefs prefers local jaggery instead of any other brand of jaggery while cooking. The most popular brands available in Kolhapur and the preferred is Local jaggery by kitchen professionals.



As the graph shows the preference of Local Jaggery brand over other brands mention in the survey are due to following reasons:-

44% prefers as the Local brand gives customised product as per their outlet requirement easily. 24% prefers for it freshness as it has better result in aroma and texture. Some small outlet prefer (19%) as it is easily available.

SUGGESTIONS

- There should be more awareness of using jaggery instead of sugar as it has more nutritive value, study reflects it is mostly preferred for dessert.
- Introduction of new recipes including diverse types of jaggery and their combination with Indian desserts will create a better understanding of jaggery in the culinary world and it will acknowledge the efforts of Jaggery processing.
- The professionals who have already established recipes by substituting sugar with Jaggery can conduct training sessions.
- A study tour in jaggery manufacturing factories will enhance the knowledge of students to produce jaggery.
- A competition of making sweets and desserts using jaggery at national level will elevate the importance of jaggery in the cuisine.
- Inclusion of jaggery in various premixed produced by the convenience foods companies will also make a difference in its cost effectiveness and promotion.

LIMITATIONS

- While working on this research project, due to pandemic of COVID-19. Researchers were not able to visit maximum restaurants & hotels in Kolhapur however collected data online.
- The researcher visited one local jaggery factory in Kolhapur to be included as case study.
- This study is limited to jaggery production, awareness about its nutritive value & uses of jaggery in the restaurants, catering outlets & hotels of Kolhapur.

FINDINGS AND OBSERVATIONS

- 86% Chefs and kitchen professionals prefer Jaggery while preparing food as it has lot of nutritional and health advantages and it helps in maintaining low food cost.
- Most of the Chefs of kolhapur preferred Jaggery over sugar in desserts and Indian sweets like Jalebi dipped in Jaggery Syrup which is available in most of the missal outlets. It shows that it is a popular sweetening ingredient in the region of Kolhapur for various reasons like good colour, consistency and also it is convenient and easily available at low price, as Kolhapur being the hub of the jaggery production.
- 69% of Chefs and kitchen professionals prefer Jaggery as sweetener while cooking food over sugar and honey, which can be easily replaced in syrups, sharbats, hot beverages and curries.
- In the region of Kolhapur as the availability and local consumers preference is always towards the jaggery. Even the jaggery research center in Kolhapur takes efforts to create awareness for the use of jaggery as it is eco-friendly, economical option and health benefits are good.
- 65.5% of Chefs and kitchen professionals prefers local jaggery instead of any other brand of jaggery while cooking as it is freshly available with best quality also customized changes are possible as locally available. The most popular brands available in Kolhapur are Patanjali, Sri Sri Tattva, Organic India, Nutriplato and Kolhapur local brands.

CONCLUSIONS

As per the finding of this research, we conclude:

- Production process of Jaggery in Kolhapur is studied in details to understand the various varieties of Jaggery and their texture differences. The case study concludes that Jaggery gives good consistency to syrup and colour if organically produced whereas Inorganic Jaggery can be used for light yellow to golden colour products.
- Jaggery is commonly used in Indian sweets. This research also reveals that kitchen professionals are trying to substitute Jaggery for bakery and confectionary product to achieve good results and customer satisfaction. Hence, the use of Jaggery in hotel industry is not limited to Indian sweets only however it can be used in savory products as a sweetener and sometimes in International dessert also to replace caramelized sugar for its health benefits.
- The preference of Jaggery by local chefs of catering services and restaurants is limited to Indian sweets few of the beverages and syrups and whereas some trained professionals of the hotels are trying out innovative recipes to establish appropriate replacement to sugar using their innovative ideas.
- Preference of Jaggery brands are more to Local brands than any other national brands available in Kolhapur due to its freshness & quality.
- Customised Jaggery products available freshly is also one of the important reason to prefer local Jaggery brands as compared to the other brands.
- Jaggery is a versatile underrated ingredient in Indian cuisine as it gives dull colour to the product but with modern research, the changed by-products of jaggery need to be promoted more in the Hotel industry.
- Diabetic and Heart patients prefers Jaggery for its medicinal properties so it can be promoted well in the restaurants then different uses of jaggery can be cultivated for better results.

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