



Gulabjamun: A Highly Delicious Indian Milk Sweet

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ABSTRACT

Gulabjamun is a very delicious traditional Indian sweet, which is very much enjoyed by everyone. Gulabjamun is a very famous dessert that is eaten at festivals, marriages, and birthdays. It has golden to dark brown colour and has a soft to firm body and smooth texture. Gulabjamun gets its brown colour because of the sugar content in khoa or milk powder. Gulabjamun in India is characterized by an unorganized nature of business. There is no denying the fact that indigenous products have come to stay as a vital fabric of the country's dairy industry. It is available commercially in the markets and also at restaurants. It can also be easily prepared at home with milk powder. Obviously, the indigenous products have a big potential

of becoming the main stay of the emerging dairy industry under the organized sector, and technological developments in their production will have far-reaching implication on it.

INTRODUCTION

Gulabjamun is popular milk based delicious sweet, which is greatly liked by Indians. It is also common in other countries, such as Nepal, Bangladesh, Pakistan, Myanmar, Mauritius, Trinidad and Tobago, and Jamaica. Gulabjamun refers to the indigenous dairy product of India, which is eaten in most festivals by all members of the family. Almost all the states of the country use Gulabjamun as one of the essential and most commonly consumed sweets. Gulabjamun is made from a mixture of khoa and refined flour usually.

As defined by Prevention of Food Adulteration Act, khoa is an indigenous milk product obtained from cow or buffalo milk or a combination thereof by rapid drying. The moisture in khoa shall not exceed 28 per cent, and milk fat content shall not be less than 20 per cent of the product. Dhap khoa having 40 -45 per cent moisture is normally used for the preparation of Gulabjamun. Like other sweets, the manufacture of Gulabjamun is also largely in the hands of halwais who adopt small scale batch method. Though there is large variation in the sensory quality of gulabjamun, the most liked product should have brown colour, smooth and spherical shape, soft and slightly spongy body free from both lumps and hard central core, uniform granular texture, mildly cooked and oily flavour, free from doughy feel and fully succulent with sugar syrup. It shall have optimum sweetness. The gross chemical composition of gulabjamun varies widely depending on numerous factors, such as composition and quality of khoa, proportion of ingredients, sugar syrup concentration, etc. In gulabjamun manufacture, dipping in sugar syrup is a key unit operation. This gives not only its characteristic sweetness but also its typical texture. The characteristic sweetness is only due to the diffusion of sugar syrup into fried gulabjamun balls. Hence,

the diffusion is one of the key processes taking place in gulabjamun manufacture. This paper describes the importance of Gulabjamun as a very popular traditional dairy product in India.

Chemical composition of Gulabjamun

Gulabjamun is milk based classic Indian sweet, which is very popular in Indian subcontinent. It contains moisture, fat, proteins, carbohydrates, and ash (Table-1).

BIS Specifications of Gulabjamun

Gulabjamun shall be prepared from khoa, skim milk powder, milk powder, ghee, cream, butter or other milk solids. It may contain maida (wheat flour), citric acid and baking powder. It shall be free from dirt and other foreign matter as well as insects and mold growth. It should be, as far as possible, manufactured and packed under hygienic conditions. The proportion of free syrup in a gulabjamun pack shall not exceed 60% of the declared net mass. According to Bureau of Indian Standards (BIS), compositional specifications of packed Gulabjamun and the requirements for sugar syrup are presented in Table-2 and 3.

Method of Preparation of Gulabjamun

Traditionally, Gulabjamun is made from khoa. Rangi and co-

Table 1: Chemical composition of Gulabjamun on drained weight basis

Characteristic	Percentage
Moisture	25-35
Fat	8.5-10.5
Proteins	6.0-7.6
Ash	0.9-7.6
Total carbohydrates (including lactose)	43.0-48.0

Table 2: Compositional specifications for packed Gulabjamun as per Bureau of Indian Standards

Characteristic	Requirements for Gulabjamun (IS:11602: 1986, Reaffirmed 1997)
Moisture,% by mass, Max	30.0
Fat,% by mass, Min	8.0
Protein, % by mass, Min	8.0
Concentration of sugar in syrup, % by mass, Min	40
Bacterial count, per g, Max	3000
Coliform count, per g, Max	50
Yeast and mould count, per g, Max	50

Table 3: Requirements for sugar syrup according to Bureau of Indian Standards

Characteristic	Requirements for sugar syrup
Acidity of syrup, ml of 0.1N NaoH required to neutralize 100 ml of the syrup, Max	6.0
Concentration of syrup, Min	62.4°Brix
Bacterial count, per g, Max	5000
Coliform count, per g, Max	50

workers (1985) standardized the recipe for Gulabjamun and reported that using 80 per cent khoa and 20 per cent refined flour for dough preparation, moisture content of the dough was adjusted to 40 per cent and baking powder was added at the rate of 0.25 per cent to the raw mix. Small amount of water can be added in case of hard dough and if it does not roll into smooth balls. The mix should be prepared fresh every time. The desirable attributes of Gulabjamun are light brown colour, smooth and spherical shape, soft and spongy body with penetration value of around 150 (precision cone penetrometer, 300 AOCS cone), absence of lumps and hard core, uniform granular texture, mild cooked flavour, free from doughy feel, juiciness and optimum sweetness (Ghosh,1983). Best quality Gulabjamun can be obtained from SMP based mix consisting of 43.5 per cent SMP, 25.0 per cent semolina, 15 per cent butter fat, 1.5 per cent baking powder and 0.1 per cent cardamom (Ghosh et al., 1984).

It is mentioned that good quality of gulabjamun can be obtained from Dhap type of Khoa, which has high moisture content (40-45 per cent) and smooth texture (Srinivasan and Rajorhia, 1976). The granular khoa (Danedar) results into a grainy sweet. Colour is most affected by frying conditions. Excessive frying results in

darker colour of the product. Products obtained from 40 per cent concentrate khoa plus trisodium citrates were softer than the others (Prajapati et al., (1990). Softness and sensory quality of Gulabjamun could be improved with the addition of 0.5 per cent trisodium citrate in milk during khoa manufacture (Prajapati et al., 1994).

In this context, Selvanayagan (1983) reported that frying temperature of 1400C, ball diameter 3 cm, ball weight 15 g and frying time of 7 min were optimum. According to Ghosh and co-investigators (1984) the frying at 1250C – 1300C for 15 min was optimum, and frying at lower temperature resulted into improper cooking, fragile texture, and light brown colour. It is pertinent to mention that temperature above 1300C, case hardening of balls took place, which prevented the heat to penetrate into the center. High temperature of frying also results in deep brown colour, which is an undesirable attribute to the product.

Srinivasan and Anantakrishnan (1964) explained that syrup concentration is likely to influence physico-chemical quality of Gulabjamun. The desired form of the product is dependent on the syrup concentration in which it is dipped and stored. They suggested the 60 per cent concentration was the

most desirable. Ghosh and co-investigators (1984) recommended the overnight soaking in 60 degrees Brix syrup at 700C. Higher concentration of syrup resulted in excessive sweetness. Dilute syrup did not impart adequate sweetness to Gulabjamun. Gulhati and others (1992) advocated the dipping of Gulabjamun balls at 60 degrees Brix in hot sugar syrup for 4 hours. However, Saxena and co-workers (1996) suggested the soaking of Gulabjamuns in sugar syrup of 60 degrees Brix concentration for overnight at room temperature.

Preparation of Gulabjamun from instant Gulabjamun mix

The existing method of Gulabjamun preparation is suitable for cottage scale, and cannot be adopted for large scale production. During summer months and festive seasons, khoa in required quantities may not be available to prepare Gulabjamuns. In order to meet khoa shortage and to produce Gulabjamun on a commercial scale, instant Gulabjamun mix was developed by Central Food Technology Research Institute, Mysore, India long back using spray dried skimmed milk powder, maida, vanaspati, citric acid, tartaric acid, and baking soda. A complete Gulabjamun mix was also formulated in National Dairy Research Institute, Karnal, India based on roller dried skimmed milk.

Traders prefer to use spray dried skimmed milk powder, as it is readily available in larger quantities. The formula from spray dried skimmed milk powder will carry higher amounts of maida and lower quantities of skimmed milk powder. This formula contains no suji, and is a trade secret of each company.

Shelf Life
The shelf life of Gulabjamun at ambient temperature, in sugar syrup is 5-7 days, which can be extended to 3 weeks by

hot filling in polystyrene tubs and adding 0.1% potassium sorbate as a preservative. Product is filled hot in previously sterilized metal cans after running through a steam chest for 7-8 min and sealed. This process is expected to give a shelf life of 6 months at room temperature.

Yield
The yield of Gulabjamun is expressed in terms of drained weight. In general, 1 litre of buffalo milk is expected to give 1 kg Gulabjamun.

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CONCLUSION
Many types of sweets are prepared mainly from the milk of cows, and buffaloes in India. Gulabjamun is one of the very delicious milk based sweets, which is enjoyed by everyone. In the preparation of Gulabjamun, the processing conditions such as syrup strength, temperature and duration of soaking influence the texture and overall acceptability of the product. It can be garnished with dried nuts, such as almonds to enhance flavor. The traditional method of Gulabjamun preparation has several limitations such as non-availability of khoa all year round, variation in its quality, and resultant Gulabjamun with poor shelf life. Consequently, many Gulabjamun instant mixes have been developed both from roller- and spray-dried skim milk. Gulabjamun of uniform and acceptable quality can be prepared by both housewives and confectioners from these mixes. As milk products may be spoiled by microbes, it is therefore, imperative to implement the good hygienic practices in all the dairy processing plants from food safety point of view.

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