



E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2019; 8(5): 506-507
Received: 10-07-2019
Accepted: 12-08-2019

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Production of Rasogolla with low calorie artificial sweetener

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Abstract

Artificial sweeteners tend to reduce Calories in foods and beverages, which may help to lose or maintain constant weight. One normally consumed low-calorie sweetener is Aspartame. Rasogolla is characterized by juicy and spongy sweet meat and prepared from cow or buffalo milk chhana. In present study the sucrose is replaced by Aspartame. Sugar syrup of traditional Rasogolla generally contains 40-50% sugar. Due to high sugar content in the product it cannot be consumed by diabetic patients and obese. Rasogolla with (45%) sucrose syrup and Aspartame (0.006%) syrups were prepared and analyzed for body and texture, flavour and taste, color and appearance.

Keywords: Chhana, aspartame, Rasogolla

Introduction

Traditional Indian dairy products have great significance as they account for over 90% of all dairy products consumed in India. As high as 45–50% of the total milk produced in India is converted into indigenous dairy products [1]. Rasogolla is a popular chhana based sweet and is offered on occasions like puja, 'Eid, birthday, marriage, religious festivals and even to guests. Rasogolla is very nutritious as it is fairly high in protein, fat, minerals specially calcium and phosphorus and also fat soluble vitamins [2, 3]. With the changing lifestyle in the affluent and the technologically developed societies trends like eating outside and having meals at odd hours is becoming a common practice. In India 29.66% people eat out frequently and about 48.14% of the population consumes high-fat diet. These habits along with lack of exercise and relaxation have given rise to health problems. World over more than 64.67% people are obese and amongst them approximately 120 million people have serious obesity problem. Obesity is associated with many health implications like hyperlipidemia, hypercholesterolemia, diabetes, hypertension, cancer and gallstones. Today, the demand of food which have free from sugar and moderate in protein content is increasing day by day which would help to avoid problems related to high sugar intake such as diabetes. The present study was planned to bring calorie conscious to enjoy it.

Material and Methods

Traditionally, preparation of Rasogolla involve manufacturing of chhana, a co-precipitate obtained by heat and acid precipitation of milk, kneading in to smooth paste, forming it into small balls 6 to 7g each, cooking the balls in boiling sugar syrup (45⁰ Brix) followed by its soaking sugar syrup for overnight. The milk was standardized to 4% fat and 8.5% SNF. It was then heated at 90°C and cooled at 70 °C. 1% citric acid was used to coagulate the milk. The chhana obtained then kneaded for making Rasogolla balls. Balls are then cooked in sugar syrup to get Rasogolla [4]. The samples were tested for physicochemical parameters (fat, proteins, total solids, moisture, acidity & yield). Organoleptic attributes (colour and appearance, body & texture, flavour and taste) were judged by trained panelist using 9-point hedonic scale. The different treatments replicated in the study were as follows.

Table 1: Details of different treatments of Control and Aspartame Rasogolla

| Materials | Different treatments (Control and Aspartame Rasogolla) |
|-----------|--|
| Aspartame | 0.006% |
| Sugar | 45% |

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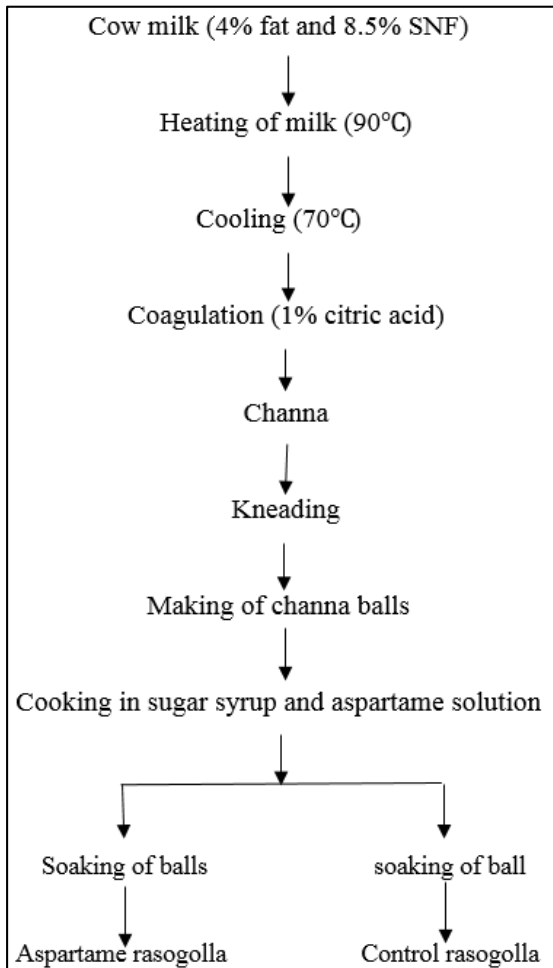


Fig 1: Flow chart for preparation of Control and Aspartame Rasogolla

Organoleptic Evaluation of the prepared product

Freshly prepared Rasogolla were served for evaluation to panel members consisting of 6 experienced persons. 9-point hedonic scale proforma was used as suggested by [5].

Statistical analyses

The data obtained on different aspects as per plan were tabulated and statistically analyzed by SPSS software.

Results and discussion

Organoleptic attributes of Control and Aspartame Rasogolla

Table-2 shows organoleptic attributes of control and Aspartame Rasogolla.

Table 2: Organoleptic attributes of Control and Aspartame Rasogolla

| Parameters | Control and Aspartame Rasogolla | | F Value | CD |
|-----------------------|---------------------------------|-----------|---------|-------|
| | sugar | Aspartame | | |
| Colour and Appearance | 7.75 | 8.30 | 12.403* | 0.209 |
| Body and Texture | 7.95 | 8.25 | 3.066** | - |
| Flavour and Taste | 8.15 | 7.9 | 8.306* | 0.277 |

* Significant at 5% level

** Non-significant at 5% level

Colour and Appearance

There was significant difference observed in different treatments for colour and appearance. The lowest value was found in control sample (7.90), followed by Aspartame

Rasogolla. F Value was 12.403, indicating significant effect of treatment on colour and appearance.

Body and texture

Body and texture of the product did not differ significantly. F Value was 3.066, indicating no significant effect of treatment on body and texture

Flavour and Taste

Flavour and taste of the product was found significant. The highest value was found in sugar syrup (8.30), followed by Aspartame (8.0). F Value was 8.306, indicating significant effect of treatment on flavour and taste.

Overall acceptability scores for Control and Aspartame Rasogolla

There were significant differences found among the treatments for overall acceptability score. The highest score was found in Aspartame Rasogolla (8.25), followed by control sample (8.01). Thus, the data showed the experimental product was a good as control. (Table.3).

Table 3: Overall acceptability of the Control and Aspartame Rasogolla

| Replication | Control Rasogolla | Aspartame Rasogolla | F Value | CD |
|-------------|-------------------|---------------------|---------|-------|
| 1 | 8.00 | 8.16 | 4.387* | 0.129 |
| 2 | 7.80 | 8.30 | | |
| 3 | 7.90 | 8.00 | | |
| 4 | 8.20 | 8.33 | | |
| 5 | 8.00 | 8.25 | | |
| 6 | 7.90 | 8.20 | | |
| Mean | 7.96 | 8.20 | | |

* Significant at 5% level

** Non-significant at 5% level

Cost Analysis of control and Aspartame Rasogolla

The data regarding cost of Control and Aspartame Rasogolla was found as expensive in Aspartame Rasogolla (235.60 Rs/kg.), followed by Control (190.60 Rs/ kg).

Table 4: Cost Analysis of Control and aspartame Rasogolla

| Parameters | Control Rasogolla | Aspartame Rasogolla |
|---------------|-------------------|---------------------|
| Cost (Rs/kg.) | 190.60 | 235.60 |

Conclusion

On the basis of the results obtained it can be concluded that the Aspartame can replace the commercial sweetener to obtain better sensory quality. However, the cost of production of the Rasogolla using artificial sweetener is slightly higher than the traditional method of production.

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