



ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating 2017: 5.03
TPI 2017; 6(5): 82-84
© 2017 TPI
www.thepharmajournal.com
Received: 15-03-2017
Accepted: 16-04-2017

Ahsan Ahmad
Research Scholar, Warner
Collage of Dairy Technology,
Sam Higginbottom University of
Agriculture, Technology and
Sciences, Allahabad, India

J David
Professor, Warner Collage of
Dairy Technology, Sam
Higginbottom University of
Agriculture, Technology and
Sciences, Allahabad, India

Correspondence
Ahsan Ahmad
Research Scholar, Warner
Collage of Dairy Technology,
Sam Higginbottom University of
Agriculture, Technology and
Sciences, Allahabad, India

Effect of different levels of low-calorie sweetener aspartame on sensory attributes of diabetic Rasgulla

Ahsan Ahmad and J David

Abstract

Low-calorie sweeteners offer a way to reduce Calories in sweet foods and beverages, which may help to lose or maintain one's weight. They also offer a way for people with diabetes to decrease their carbohydrate intake. One commonly consumed low-calorie sweetener is Aspartame. Rasgulla is a juicy and spongy sweet meat and prepared from cow or buffalo milk chhana, but good Rasgulla is prepared from cow milk chhana. Diabetic Rasgulla is specially made for people who are suffering from diabetes. Here instead of sucrose, alcoholic sugar such as Aspartame is used. Sugar syrup of traditional Rasgulla generally contains 40-50% sugar. Being a high sugar product it cannot be consumed by people with health related issues like diabetic patients, obese. Rasgulla with (40%) sucrose syrup and (0.005%, 0.006%, 0.007%) alternative sweetener (Aspartame) syrup were prepared; Studies on chemical analysis, cost effectiveness and acceptance by people was conducted. Though it was not possible to replace sucrose entirely by Aspartame, the sugar percentage (nearly 50% in traditional Rasgulla) was tried to bring down to as low as possible limit.

Keywords: Cow milk, Chhana, aspartame, Rasgulla

Introduction

Since time immortal indigenous milk products occupied the heart of Indian mass from grass root level up to top layer of society. Modern advances made these products rather attractive and competitive in the business world. Technical knowhow made quality of the products rather comprehensive to national and international scenario as well. Thus qualities of indigenous milk products are embedded now with utmost care to catch up business trend of the market for greater revenue and consumer's satisfaction (1). Rasgulla regarded as the king of Indian milk sweets are prepared by kneaded chhana balls under control cooking in boiling sugar syrup. In appearance it is snow white, soft and succulent sphere shaped (2&3). Rasgulla is a chhana-based, syrupy sweet dish. Originally the dish is made from ball shaped dumplings of chhena (an Indian cottage cheese) and semolina dough, cooked in light syrup made of sugar. This is done until the syrup permeates the dumplings.

Typically, a 100 gram serving of Rasgulla contains 186 calories, out of which about 153 calories are in the form of carbohydrates. It also contains about 1.85 grams of fat and 4 grams of protein.

Indigenous dairy product has played an important role in socio economic life of Indians since time immemorial and they account for over 90% of dairy products consumed.

About 45 to 50% of milk produced in the country is converted into indigenous products and the consumption is likely to grow at an annual rate of more than 20% and the demand for Rasgulla may increase up to 6000 metric tons by the year by the year 2009.

Diabetic Rasgulla is specially made for people who are suffering from diabetes. Here instead of sucrose, alcoholic sugar such as Aspartame is used. The sweeteners that are used in the present studies include Aspartame.

Aspartame is a low-calorie sweetener that provides sweetness to foods and beverages without adding significant calories. Nutrition and fitness experts agree that balancing the calories you consume with the calories you burn is important for health. Aspartame can play a role in weight management programs that combine sensible nutrition and physical activity. Aspartame has been studied extensively and has been found to be safe by experts and researchers. Government agencies worldwide, including the U.S. Food and Drug Administration (FDA), have also reviewed the science and found aspartame to be safe for human consumption. Aspartame consists of two amino acids (the building blocks of protein) – phenylalanine and aspartic acid.

It is about 200 times sweeter than sugar, so very small amounts of aspartame are needed to provide the same sweet taste. Aspartame is available as a tabletop sweetener and in many products, including a variety of beverages, dairy products, canned fruits, desserts, confections, sauces and dressings. In addition to helping with weight management, aspartame does not cause dental cavities and may be consumed by people with diabetes. (I F I C F)

Materials and method

Traditionally, preparation of Rasgulla involve manufacturing of chhanna, 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(50 to 550 Brix) followed by its soaking sugar syrup (35 to 400) for overnight.

First of all, cow milk was standardized to 4% fat and 8.5% SNF. It was then heated at 90 and cooled at 70 °C. 1% citric acid was used to coagulate the milk. The chhanna obtained then kneaded for making Rasgulla balls. Balls are then cooked in sugar syrup to get Rasgulla (4). For preparation of diabetic Rasgulla solution of aspartame was prepared. The samples were tested for physicochemical parameters (fat, proteins, total solids, moisture, acidity & yield) and microbiological parameters (SPC, yeast and mould count, coliform count) as per procedure given in the food chemistry manual of Allahabad Central University. 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 Rasgulla

Materials	Different treatments (Control and Aspartame Rasgulla)			
	T ₀	T ₁	T ₂	T ₃
Aspartame	-	0.005%	0.006%	0.007%
Sugar	40%	-	-	-

Table 2: Organoleptic attributes of Control and Aspartame Rasgulla

Parameters	Control and Aspartame Rasgulla				F Value	CD
	T ₀	T ₁	T ₂	T ₃		
Colour and Appearance	7.75	8.30	8.12	8.20	12.403*	0.209
Body and Texture	7.95	8.25	8.15	8.30	3.066**	-
Flavour and Taste	8.15	7.9	7.7	7.55	8.306*	0.277

* Significant at 5% level
 ** Non-significant at 5% level

Body and texture

Body and texture of the product did not differ significantly. The highest value was found in T₃ (8.30), followed by T₁ (8.25), T₂ (8.15) and T₀ (7.95). F Value was 3.066, indicating no significant effect of treatment on body and texture (Fig.2).

Flavour and Taste

Flavour and taste of the product was found significant. The highest value was found in T₀ (8.15), followed by T₁ (7.9), T₂ (7.7) and T₃ (7.55).F Value was 8.306, indicating significant effect of treatment on flavour and taste (Fig.2).

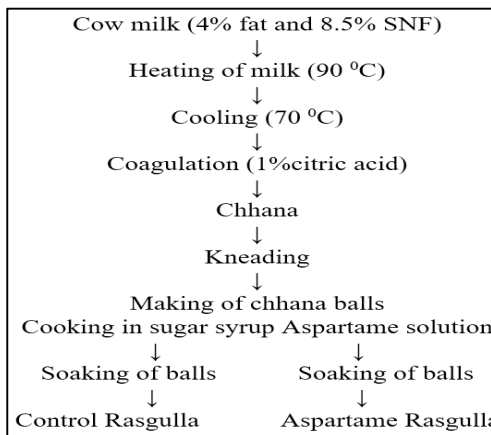


Fig 1: Flow chart for preparation of Control and Aspartame Rasgulla

Organoleptic Evaluation of the prepared product

Freshly prepared Rasgulla were served for evaluation to panel members consisting of 5 experienced persons. 9 point hedonic scale proforma was used as suggested by (5).

Statistical analys

The data obtained on different aspects as per plan were tabulated and statistically analyzed as per (6).

Results and discussion

Organoleptic attributes of Control and Aspartame Rasgulla

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

Colour and Appearance

There were significant difference observed in different treatments for colour and appearance. The lowest value was found in T₀ (7.75), followed by T₂ (8.12), T₃ (8.20) and T₁ (8.30). F Value was 12.403, indicating significant effect of treatment on colour and appearance (Fig.2).

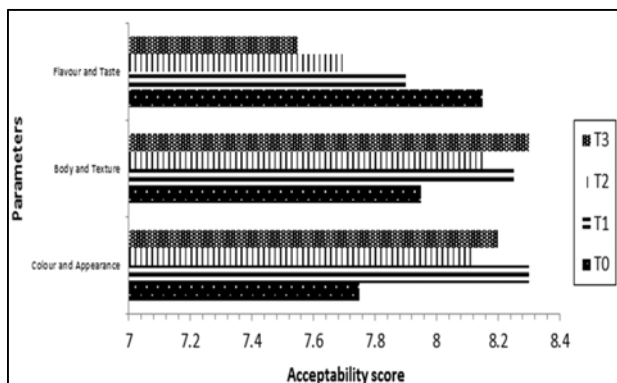


Fig 2: Average of Sensory Properties and overall acceptability score for control and Aspartame Rasgulla

Overall acceptability scores for Control and Aspartame Rasgulla

There were significant differences found among the treatments for overall acceptability score. The highest score

was found in T₁ (8.144), followed by T₀ (7.952), T₃ (8.032) and T₂ (7.982). Thus, the data showed the experimental product was a good as control. (Table.3).

Table 3: Overall acceptability of the Control and Aspartame Rasgulla

Replication	Control and Aspartame Rasgulla				F Value	CD
	T ₀	T ₁	T ₂	T ₃		
R ₁	8	8.167	8	8	4.387*	0.129
R ₂	7.75	8	7.833	8.083		
R ₃	7.917	8	8.033	8.0833		
R ₄	8.167	8.333	8	8		
R ₅	7.917	8.25	8.083	8.083		
Mean	7.952	8.144	7.982	8.032		

* Significant at 5% level

** Non-significant at 5% level

Cost Analysis of control and Aspartame Rasgulla

The data regarding cost of Control and Aspartame Rasgulla was found as expensive in T₁ (231.60Rs/kg.), followed by T₂

(221.60 Rs/ kg), T₃ (211.60Rs/kg and T₀ (197.60 Rs/ kg) (Table 4, Figure 4).

Table 4: Cost Analysis of Control and aspartame Rassgulla

Parameters	Control and Aspartame Rassgulla			
	T ₀	T ₁	T ₂	T ₃
Cost (Rs/kg.)	197.60	231.60	221.60	211.60

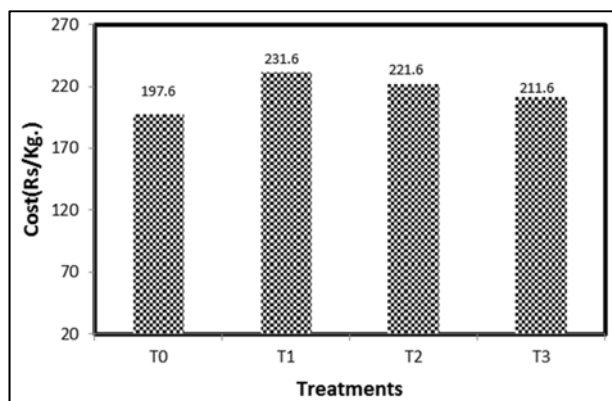


Fig 4: Cost Analysis of control and Aspartame Rasgulla

Conclusion

On the basis of the results obtained it can be concluded that the Aspartame powder can be successfully used for improving sensory quality of Rasgulla, without sacrificing its palatability. 0.005% Aspartame proved to be best among all treatments for manufacturing Dibetic Rasgulla.

Reference

1. David J. Indigenous milk products of north India. Ingredients South East Asia (food and beverage, B2B news magazine). 2016; 3:14-15.
2. David J. Acid coagulated milk products. In, Technological advances in indigenous milk products. pp 68-137. Kitab Mahal, New Delhi, 2013.
3. Tarafder HN, Prasad N. Mechanical kneading of chhana and quality of Rasgulla, J. Fd. Sci. Tech, 1987; 32(2):109-144.
4. Battacharya Deshraj DC. Studies on the production of Rasgulla, Indian J. Dairy Sci, 1980; 33(2):237-243.
5. Amerine MA, Pangborn RM, Rossler EB. Principals of sensory evaluation of food. New York Academic Press. 1965, 104-110.

6. Chandel SRS. A handbook of agriculture statistics, 8th Ed, 1991.