

# Sensory and Microbiological Quality of Rasgulla Sold in and Around Greater Hyderabad Municipal Corporation

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## Abstract:

The present study was carried out to evaluate sensory and microbiological quality of rasgulla sold in and around Hyderabad city, India. The overall sensory score of rasgulla samples collected from Branded and Unbranded samples was 94.8 and 86.5 respectively under 100point score card. The pH value was 6.53 and 6.25, the acidity value were 0.31 and 0.34 and Free fatty acid score were 0.93 and 0.98 in the branded and unbranded samples. The standard plate count were 4.3 log CFU/g and 5.8 log CFU/g, the *coliform* count were 2.0 log CFU/g and 8.95×10<sup>4</sup> CFU/g and the *yeast and mould* Count was absent in branded samples and 5.3 log CFU/g in unbranded samples respectively. The microbiological counts were high in unbranded samples and least in branded samples.

**Keywords – Rasgulla, Sensory quality, Microbiological quality.**

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## I. INTRODUCTION

India is the largest milk producer accounts for 21.29% of world milk production (NDDDB 2017). The perishable nature of milk is overcome by producing value added milk products. Nearly 50 to 55% of milk produced is converted into indigenous milk products such as Khoa, Chhana and yoghurt etc. [16]. Chhana is coagulated milk precipitate by heat and acid treatment. Rasgulla is Chhana based sweet and most popular consumed during festivals and other occasions. Rasgulla generally made from cow milk and very few

reports from buffalo milk [12]. Rasgulla is a sucrose heavy dessert since it is boiled and served in sugar syrup having single string consistency.

Rasgulla of 100g generally offers 186kcal where carbohydrate provide 153kcal, Fat 17kcal and protein 16kcal [24]. Rasgulla suffers from rancidity (hydrolytic and oxidative) like other water - oil emulsion and several physiochemical changes occur during storage [22]. Presently rasgulla is prepared mostly in sweet shops and other small scale sector, where the hygienic conditions are not satisfactory level. Slowly branded sector also entering in the manufacture of

rasgulla where in the hygienic conditions are improved. Much research work has not done in our country on the quality and manufacture of rasgulla. There is need to study the quality of rasgulla available in the market, so the present study was planned to assess the organoleptic and microbiological quality of rasgulla sold in and around Hyderabad city, India.

## II. MATERIALS AND METHOD:

Thirty Rasgulla samples each from branded and packed as well as from unpacked selling loosely by hawkers and retail sweet shops. The samples were packed in Polythene selfsealing bags, kept in icebox, transported to Department of Veterinary Public Health and Epidemiology and kept in refrigerated till analysis is undertaken. The organoleptic quality was judged by Five judges from the staff members of the college using a score card containing 45 for flavour, 35 for body and texture and 20 for colour and appearance [19]. The pH of the syrup was measured by digital pH meter and the acidity was measured by the procedure mentioned in Bureau of Indian standards [9]. The free fatty acid content was determined according to the procedure [15] with some modifications. The total viable count was estimated using nutrient agar, the *coliform* count was done using Mac Conkey agar following the procedure of IS 4079(1967). The *yeast* and *mould* count was determined as per method given in [10] using potato dextrose agar.

## III. RESULTS AND DISCUSSION:

Table 1: Organoleptic score of rasgulla samples from different sources

Characteristic	Branded	Unbranded
Flavour (45)	42.8	39.5
Body and texture (35)	32.5	28.2
Colour and Appearance(20)	19.5	18.8
Overall acceptability	94.8	86.5

The flavour score was high (94.8) in the rasgulla samples collected from branded and low (86.5) for the samples collected from unbranded

samples in the present study. A flavour score of 48.33 out of 50 points was reported for the rasgulla samples from Bangladesh [3] which was almost similar to the flavour score for branded samples in the present study. Low flavour score of 46.0 out of 50 was reported for the rasgulla samples prepared from cowmilk [2]. Very low score of 43.75 out of 50 was reported [11], [4]. A flavour score of 33.0 out of 35 points from Egypt [18] was almost similar to the flavour score observed in the unbranded samples in the present study. A Flavour score of 8.15 [1], 8.6 [13], 8.83 [20] and 8.0 [5] following 9 headonic scale which was almost comparable with the flavour score in the present study for branded samples. A flavour score of 7.0 out of 9 headonic scale reported [7] was less than the score (39.5) observed in the samples from unbranded in the present study.

The body and texture score was high (32.5) in the rasgulla samples collected from branded and low (28.2) for the samples collected from unbranded samples. The body and texture score of 28 out of 30 score reported from Bangladesh [3], 27.8[1] and 27.5 [24] was almost similar to the body and texture score of the branded samples in the present study. The body and texture score of 37.89 out of 45 points reported [18] was almost similar to the body and texture score in the present study from unbranded samples. A body and texture score of 8.83 [21], 8.6 [13], 8.5[5] of 9 point headonic scale were almost similar to the score of rasgulla samples from branded in the present study. A low body and texture score of 7.95 out of 9 headonic scale reported [1] was slightly higher than the score for the unbranded samples in the present study.

The colour and appearance was high (19.5) in the rasagulla samples collected from branded and low (18.8) for the samples collected from unbranded samples, out of 20 points in the present study. The colour and Appearance of 18.66 from Bangladesh [3] and 18.75 from Egypt [18] were almost similar to the score of rasgulla samples from unbranded sector in the present study. The colour and appearance score of 8.12 [21], 8.4 [13] out of 9 headonic scale were almost similar to the score of samples from unbranded sector in the present study. The colour and appearance score of 7.0 [5] and 7.75 [1] out of 9 headonic scale were very low compared to the rasgulla samples from any two of the sources in the present study.

The overall acceptability was high (94.8) in the rasgulla samples collected from branded and low (86.5) for the samples collected from unbranded samples in the present study. The overall acceptability score of 93.9 was reported from Bangladesh [3] was almost similar to the score of rasgulla samples collected from the branded in the present study. Low overall acceptability score of 84.37 from Egypt [18] and 85.38 [11] were almost similar to the score in the present study from unbranded samples. An overall acceptability score of 8.0 [1], 8.5 [5] and 8.95 [21] based on 9 point hedonic scale was almost similar to the overall acceptability score observed in the present study for branded samples. The overall acceptability score of 7.6 out of 9 hedonic scale [13] was almost similar to the overall acceptability score for the samples from unbranded in the present study.

Table 2: Physicochemical properties of rasgulla from different sources

Characteristic	Branded	Unbranded
pH	6.53	6.25
Acidity	0.31	0.34
Free fatty acid	0.90	0.98

The pH of the rasgulla samples were 6.53 and 6.25 from branded and unbranded samples respectively in the present study. The pH values of 6.56 [5] and 6.51 [18] reported was almost similar to the pH value of 6.53 observed in the samples from branded in the present study. Low pH of 5.71 [14] was reported which was less than the pH value of both the sources in the present study.

The Acidity of the rasgulla samples were 0.31 and 0.34 % citric acid from branded and unbranded samples respectively. An acidity of 0.30% citric acid [5] was almost similar to the acidity observed in the sample from branded in the present study, whereas higher acidity of 0.50% citric acid was reported [3]. Very high acidity of more than 0.5% citric acid was reported [8] and [23]. Higher acidity of 4.14 ml 0.1N

NaOH per 100 ml [13] and 4.21 ml 0.1N NaOH per 100 ml [14] was higher than the acidity observed in the rasgulla samples from both sources in the present study, whereas low acidity values of 2.10ml 0.1N NaOH per 100ml of syrup was reported [17], [6].

Free fatty acids content of 0.92 10<sup>2</sup>g oleic acid [21] and 0.9110<sup>2</sup>g oleic acid [21] were almost similar to the values observed in the samples from branded in the present study.

Table 3: microbiological analysis of rasgulla from different sources

Characteristic	Branded (log CFU/g)	Unbranded(log CFU/g)
SPC	4.3	5.8
coliform	2.0	6.0
Yeast and mould	nil	5.3

The standard plate count in the rasgulla were 4.3log CFU/g and 5.8 log CFU/g in the samples from branded and unbranded sector respectively. The SPC of 3 log CFU/g [5] was less than the SPC of any source in the present study. The SPC of 4.5 log CFU/g [13] was almost similar to the SPC observed in the samples from branded in the present study. The SPC of 4 log CFU/g [6] slightly less than the SPC observed in the samples from branded sector in the present study.

The *coliform* count in the rasgulla were 2.0 log CFU/g and 6.0 log CFU/g in the samples from branded and unbranded sector respectively. The *coliforms* were absent in the rasgulla samples. [5]

The *yeast and mould* count were nil in branded and 5.3 log CFU/g in unbranded sector respectively. The *yeast and mould* was absent in the present study, was coinciding the results reported [5], [13]. The *yeast and mould* count reported [21] is slightly less than the counts observed in the samples from branded sector in the present study.

## IV. CONCLUSIONS

The organoleptic Quality of Rasgulla was high in branded sample, less in unbranded sample and the microbiological counts were high in unbranded samples, least in branded sample in the

present study.

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