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## Microbiological analysis of canned rasgullas

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### ABSTRACT

Nutritionally, milk is the single most complete natural food. When freshly drawn milk is held at ambient temperatures, rapid changes occur in its physical, chemical and organoleptic characteristics mainly due to proliferation of microorganisms. The present study aims at microbiological analysis and identification of predominant microorganisms in canned rasgullas which are considered as milk sweets and which are prone to microbial contamination if aseptic conditions are not maintained during its preparation and packaging. © 2013 Trade Science Inc. - INDIA

### KEYWORDS

Rasgulla;  
Milk solids – not fat;  
Microbiological analysis.

### INTRODUCTION

Since the dawn of civilization, man has used milk of domesticated herbivorous animals for his nutritional needs. Milk is the normal mammary fluid secretion derived from complete milking of healthy milch animals. Milk is recognized as a nutritive food par excellence and often referred to as nature's most nearly perfect food. The milk food group makes important contributions to the human diet as milk contains all the nutrients in a balanced proportion needed for growth and good health. Milk and dairy products cannot be considered as isolated substances in the diet. Rather, they are considered as one of the essential food groups required for a well balanced nutrition. They form a vital part of the human diet in most societies throughout the world<sup>[1]</sup>.

The cow is the principal source of milk for human consumption in many parts of the world, other animals as sources of milk for human beings are the buffalo, goat, sheep, camel, mare, etc. The yield of milk and its composition, from the same source, vary de-

pending upon many factors. These include the breed of the animal, its age, the stage of lactation, time of milking, time interval between milking, season of the year, feed of the animal and so on<sup>[2]</sup>.

Milk from different sources, regardless of breed or even species, contain the same class of constituents. They are water (85.5-88.5%), dry matter (12.75%), milk fat (3-6%), protein (3.4%), milk sugar (approximately 5%), ash (approximately 0.7%). All the solids in milk are referred to as "total solids" (11.4-14.5%) and the total solids without fat is known as "milk solids – not-fat" (MSNF).

Ancient vedic literature mentions the use of milk for the preparation of various milk products including milk sweets. According to ISI, canned rasgulla are prepared from channa obtained from clean, fresh and sweet milk<sup>[3]</sup>.

### MATERIALS AND METHODS

Sample collection: Seven different brands of commercially manufactured rasgulla, packed in different

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packaging materials like aluminium cans, lacquered tin cans, bottles with aluminium caps, polyethylene sachets were collected in Bangalore city on the basis of consumer availability and purchased from popular agencies or stores.

### Microbiological analysis

Different brands of Rasgulla samples packed in different packaging material were seal opened and the containers were emptied individually on individual wire sieves to separate rasgullas. The syrup was allowed to drain for 10 minutes and was collected individually in containers.

#### (a) Sampling

Eleven g/ml of the rasulla or syrup sample was weighed aseptically in a sterile beaker and transferred to 99ml of sterile normal saline and rendered into a fine paste using a pre-sterilized pestle and mortar thoroughly in a suitable container. 10 fold serial dilutions were prepared using 9ml sterile normal saline dilution blanks for rasgulla and syrup samples separately. 1ml of the sample from  $10^{-5}$  dilution was taken and was plated on nutrient agar plates. The plates were incubated at 37 °C for 24hrs in the incubator<sup>[4]</sup>.

#### (b) Determination of total bacterial count

The total bacterial count (TBC) was enumerated according to the procedure described in IS:4079-1967 (TABLE 1)<sup>[5]</sup>.

#### (c) Determination of yeast and mold count

The yeast and mold count was determined according to the procedure recommended by American Public Health Association (APHA, 1978) using potato dextrose agar medium (Hi-media) (TABLE 1).

#### (d) Identification of predominant organisms from canned rasgullas

The predominant organisms present in canned rasgullas were identified by Gram staining (TABLE 2).

## RESULTS AND DISCUSSION

In canned rasgullas defects like high acid and gas production are commonly observed which is a consequence of microbial spoilage. Therefore the cans are examined for the presence of total microorganisms and Yeasts and Molds in both rasgullas and syrup. The total bacterial count in seven different brands of rasgullas ranges from minimum of 48/g to a maximum of 1020/g. The

TBC in syrup was found to be in the range of 10-660/ml. While yeasts and molds counts was found to be in a range of 15-26/g in rasgulla and around 10-28/ml in syrup. The yeasts and molds were identified only in two cans. The study reveals that improper boiling and improper transfer of Rasgulla and syrup into the cans leads to contamination. The predominant microorganisms found in rasgullas and syrup are Diplococci, Streptococci and Bacilli which are heat resistant organisms. So it can be concluded that the preparation, processing and packaging of rasgullas play an important role in preventing the spoilage of rasgullas and maintaining their shelf life.

TABLE 1 : Determination of total microbial count.

| Different brands of Rasgulla | Rasgulla |                   | Syrup |                   |
|------------------------------|----------|-------------------|-------|-------------------|
|                              | TBC/g    | Yeast and Molds/g | TBC/g | Yeast and Molds/g |
| 1                            | 240      | Nil               | 86    | Nil               |
| 2                            | 128      | Nil               | 42    | Nil               |
| 3                            | 48       | Nil               | 12    | Nil               |
| 4                            | 840      | 15                | 410   | 10                |
| 5                            | 1020     | 26                | 660   | 28                |
| 6                            | 68       | Nil               | 10    | Nil               |
| 7                            | 102      | Nil               | 33    | Nil               |

TABLE 2 : Identification of predominant organisms from canned rasgullas.

| Isolate | Morphology                  |                                      |
|---------|-----------------------------|--------------------------------------|
|         | Rasgulla                    | syrup                                |
| 1       | Diplococci                  | Diplococci                           |
| 2       | Diplococci and Streptococci | Diplococci and Streptococci          |
| 3       | Diplococci and Streptococci | Diplococci and Streptococci          |
| 4       | Diplococci and Bacilli      | Diplococci, Streptococci and Bacilli |
| 5       | Diplococci and Streptococci | Diplococci and Streptococci          |
| 6       | Diplococci                  | Diplococci                           |
| 7       | Diplococci and Streptococci | Diplococci and Streptococci          |

## REFERENCES

- [1] R.P.Aneja; Traditional milk specialities –A survey, Dairy India, 259-262 (1992).
- [2] Anonymous; Report of the national dairy research institute report instituteno, 17, 24 (1955-56).
- [3] W.B.B.Date, Y.S.Lewis, D.S.Johr, D.T.Bhatia; Studies on the preparation and preservation of rasgulla, Food Sci., 7(1), 217-227 (1958).
- [4] V.K.Goel; Studies on manufacture and packaging of rasgulla, M.Sc.thesis, Punjab University, Chandigarh.
- [5] IS : Indian Standard specification for canned rasgolla, 4079-1967.