

Effect of sugar and cardamom on the quality and shelf-life of Kachchagola sandesh

RAMJI GUPTA, P. K. UPADHYAY, AND VIJAY SINGH

ABSTRACT

The sandesh was prepared with different levels of sugar and cardamom and was analyzed for sensory chemical and microbial quality. The overall super organoleptic quality was observed in 0.2 per cent cardamom with 30 per cent sugar stored sandesh 0 day whereas in chemical quality, maximum total solid was noted in 0.3 per cent cardamom level with 40 per cent sugar 28 days. Maximum protein was recorded in 0.3 per cent cardamom level with 30 per cent sugar and stored for 28 days. Maximum sucrose was observed similar of three level of cardamom with 40 per cent sugar for 28 days and fat also noted in similar of cardamom level with 30 per cent sugar for 28 days stored. The minimum plates count was observed in fresh samples and YMC not detected in fresh samples. It is recommended that the best quality sandesh could be prepared from 0.2 per cent cardamom with 30 per cent sugar.

KEY WORDS : Kachchagola, Sandesh, Cardamom, SPC

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INTRODUCTION

Indigenous milk product Chhana is utilized as a base product for the production of Bengali sweets. The most popular Chhana based sweets are Rasogolla and Sandesh. Rasogolla is widely popular as Bengali sweet and has crossed the boundaries of eastern India and Bangladesh and now most popular through out Northern zone.

Sandesh is another Chhana based sweet which is popular in Eastern India and Bangladesh. This is a good source of protein, fat, sucrose and fat soluble vitamins like A, D, E and K. The production of this product is still confined to the place of its origin, Kolkata which is the main place of Sandesh production in country. Many varieties of Sandesh are sold in various places. Sandesh differs in respect of its appearance, flavour, body and texture rheology and composition. Sandesh can be broadly grouped into three main classes depending upon its body and texture, moisture and sugar contents e.g. Naramak (soft grade), Karapak (hard grade) and Kachhagolla. In each type, cow milk chhana is usually preferred over buffalo milk for Sandesh making because of its soft body, smooth texture and small grains.

Correspondence to:

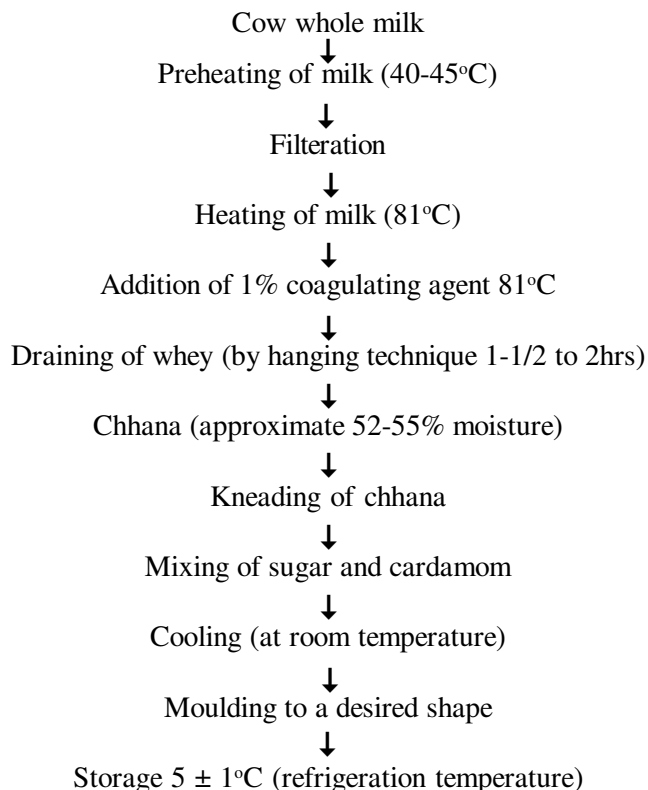
RAMJI GUPTA, Department of Animal Husbandry and Dairying, C.S. Azad University of Agriculture and Technology, KANPUR (U.P.) INDIA

Authors' affiliations:

P.K. UPADHYAY AND VIJAY SINGH, Department of Animal Husbandry and Dairying, C.S. Azad University of Agriculture and Technology, Kanpur (U.P.) INDIA

MATERIALS AND METHODS

Flow diagram for preparation of kachhagolla Sandesh:



Factors to be studied:**Sensory evaluation**

Flavour
 Body and texture
 Colour appearance
 Overall acceptability
 Chemical analysis
 Total solids per cent
 Fat per cent
 Protein per cent
 Sucrose per cent according to Upadhyaya *et al.* (1976)
 (v) Ash per cent

Microbiological quality analysis were done according to standard methods for the examination of the dairy product (1978):

S.P.C. (Standard plate count/g)
 Coliform count/g
 Yeast and moulds count/g

RESULTS AND DISCUSSION

The maximum flavour score (8.10) was noted in A₂ samples and lowest flavour score (7.32) was noted in A₁ samples. The higher score of flavour (7.63) was noted in 40 per cent sugar level (B₂) samples while 30 per cent sugar level showed significantly inferior flavour score than the 40 per cent sugar level. As regard the period of storage. The maximum flavour score (8.12) was noted in fresh samples (C₁) and minimum flavour score (6.95) was noted in 28 days stored samples (C₃). The maximum body and texture score (7.55) was noted in A₂ samples and lowest body and texture score (7.05) was noted in A₁ sample.

The higher score of body and texture (7.55) was noted in 40 per cent sugar level (B₂) samples while 30 per cent sugar level showed significantly inferior body and texture than the 40 per cent sugar level. As regard period of storage. The maximum body and texture score (7.83) was noted in fresh samples (C₁) and minimum body and texture score (6.91) was note in 28 days stored samples (C₃).

The maximum colour and appearance score (7.05) was noted in A₂ samples and lowest colour and appearance score (6.10) was noted in A₃ samples. The higher score of colour and appearance (6.87) was noted in 30 per cent sugar level (B₁) samples while 40 per cent sugar level showed significantly inferior colour and appearance score than that the 30 per cent sugar level. As regard the period of storage the maximum colour and appearance score (7.16) was noted in fresh sample (C₁) and minimum colour and appearance score (6.25) was noted in 28days storage (C₃) samples.

The maximum overall acceptability score (8.08) was noted in A₂ samples and lowest overall acceptability score (7.03) was noted A₃ in samples. The higher score of overall acceptability (7.86) was noted in 30 per cent sugar level (B₁) samples while 40 per cent sugar level showed significantly inferior overall acceptability score to than the 30 per cent sugar level. As regard the period of storage. The maximum overall acceptability score (8.16) was noted in fresh samples (C₁) and minimum overall acceptability score (7.28) was noted in 28 days storage (C₃) samples. The similar results were reported by Sen and Rajhoria (1987).

The maximum solid content (73.25 per cent) was noted in 0.3 per cent cardamom level (A₃) and minimum (73.08 per cent) solids were noted in A₁ samples. As regard the sugar levels the maximum solid content (75.30 per cent) was noted in B₂ samples and minimum solids (71.03 per cent) was recorded in B₁ samples. So for as the storage periods. The maximum (73.40 per cent) and minimum (72.90 per cent) solids content were observed in C₃ and C₁ samples respectively.

The fat content (13.39 per cent) in all samples A₁A₂A₃. As regard the sugar levels the maximum fat content (14.74 per cent) was noted in 30 per cent sugar levels (B₁) while 40 per cent sugar levels showed significantly lower fat content than the 30 per cent sugar level samples. So for as the storage periods the maximum fat content (13.53 per cent) were noted in C₃ samples while minimum fat (13.26 per cent) was noted in fresh samples (C₁). The similar results were reported by Sen and Rajhoria (1987).

The maximum protein content (15.87 per cent) was noted in 0.3 per cent cardamom levels (A₃) samples while minimum protein content was noted in 0.1per cent cardamom level (15.76 per cent) samples. As regard the sugar levels the higher protein content (17.40 per cent) was noted in 30 per cent sugar while 40 per cent sugar level showed significantly lower protein content than the 30 per cent sugar level. So for as the storage periods the maximum protein content (15.88 per cent) was noted in C₃ samples and minimum protein content (15.75 per cent) was noted in fresh samples (C₁).

The similar sucrose contents (40.23 per cent) were noted in all cardamom levels (A₁, A₂, A₃). As regard the sugar levels the maximum sucrose content (45.28 per cent) was noted in 40 per cent sugar levels samples, while 30 per cent sugar levels showed significantly lower sucrose content than the 40 per cent sugar levels samples. So for as the storage periods the maximum sucrose content(40.30 per cent) were noted in C₃ samples while minimum sucrose

Cardamom	Flavour score	Body score	Colour and appearance score	Overall acceptability score	Total solids (%)	Fat (%)	Protein (%)	Sucrose (%)	Ash (%)	SPC ($\times 10^4/g$)	Yeast and moulds count ($\times 10^3/g$)
Cardamom 0.1% (A ₁)	7.32	7.05	7.07	8.03	73.08	13.39	15.75	10.23	1.70	10.89	11.33
Cardamom 0.2% (A ₂)	8.10	7.55	7.65	8.08	73.16	13.39	15.82	10.23	1.71	10.77	12.50
Cardamom 0.3% (A ₃)	7.37	7.53	6.10	7.03	73.25	13.39	15.87	10.23	1.73	10.61	10.83
Sugar 30% (B ₁)	7.55	7.20	6.87	7.86	71.03	12.77	17.10	35.18	1.71	10.87	13.11
Sugar 40% (B ₂)	7.63	7.55	6.56	7.56	75.30	12.05	17.23	15.18	1.66	10.66	11.66
0 day storage period (C ₁)	8.12	7.83	7.16	8.16	72.90	13.26	15.75	10.16	1.71	11.2	0.00
7 days (C ₂)	7.70	7.38	6.75	7.70	73.19	13.10	15.82	10.27	1.71	8.92	33.66
28 days (C ₃)	6.95	6.91	6.25	7.28	73.10	13.53	15.88	10.30	1.71	19.27	97.00

was noted in C₁ samples). The similar results were reported by Sen and Rajhoria (1987).

The maximum ash content (1.73 per cent) was noted in 0.3 per cent cardamom levels (A₃) samples and minimum ash (1.70 per cent) was noted in A₁ samples. As regard the sugar levels, the maximum ash content (1.77 per cent) was noted in 30 per cent sugar level. While minimum ash (1.66 per cent) was noted in B₂ samples. So for as the storage period the similar ash content (1.71 per cent) were noted in all (C₁, C₂ and C₃) sample.

Minimum plate count ($10.61 \times 10^4/g$) was noted in 0.3 per cent cardamom level (A₃) and maximum plate count ($10.89 \times 10^4/g$) was noted in A₁ samples. The minimum plate count ($10.66 \times 10^4/g$) was noted in 40 per cent sugar level, while in case of 30 per cent level of sugar the plate count showed significantly higher score then the 40 per cent sugar. The similar results were reported by Sen and Rajhoria (1996) and Sen and Rajhoria (1990).

The maximum yeast and moulds count ($44.33 \times 10^2/g$) was noted in 0.1 per cent cardamom levels (A₁) samples where it was minimum in A₃ sample. The minimum yeast and moulds count ($41.66 \times 10^2/g$) was noted in 40 per cent sugar levels (B₂) samples while 30 per cent sugar levels showed significantly higher yeast and moulds count to that of 40 per cent sugar level. As regard the periods of storage, the fresh samples showed no any contamination of yeast and mould count while the increasing the storage periods the yeast and mould count significantly increased. As regard the storage periods the minimum plate count ($4.12 \times 10^4/g$) was noted in fresh samples (C₁) after that the plate count significantly increase with increasing storage periods. Similar results were reported by Khan *et al.*, (2002).

Conclusion:

The overall organoleptic quality was observed in case of fresh sandesh made from 0.2 per cent cardamom and 30 per cent sugar level. Organoleptic quality of stored sandesh (day) containing higher amount of sugar (30 per cent) was superior than the sandesh having (40 per cent) sugar. The overall higher total solids content were in case of sandesh made from 0.3 per cent cardamom having 40 per cent sugar and stored for 28 days. Fat content was found in case of sandesh made from 0.1 per cent, 0.2 per cent and 0.3 per cent similar with 30 per cent sugar level and stored 28 days. And maximum protein was noted in 0.3 per cent cardamom levels having 30 per cent sugar stored for 28 days and higher sucrose content was noted in similar in three level of cardamom (0.1 per cent, 0.2 per

cent, 0.3 per cent). The lowest SPC and YMC was noted in fresh sample made from 0.3 per cent cardamom level with 40 per cent sugar. The SPC increased with increasing of storage periods. Coliform count show no contamination in fresh as well as stored sample.

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