



## Studies on Physico-chemical quality parameters of Gulabjamun prepared by different level of Khoa and Paneer

Anoop Singh<sup>1</sup>, Kaushal Kishor<sup>2</sup>, Sandeep GM Prasad<sup>3</sup>, Smita Majumder<sup>4</sup>, Priyanka<sup>5</sup>

<sup>1,4,5</sup> Research Scholar, Warner College of Dairy Technology, Sam Higginbottom University of Agriculture, Technology and Sciences, Allahabad, Uttar Pradesh, India

<sup>2</sup> Assistant Professor G.S. Degree College Allahabad State university Allahabad Uttar Pradesh, India

<sup>3</sup> Associate Professor Warner College of Dairy Technology, Sam Higginbottom University of Agriculture, Technology and Sciences, Allahabad, Uttar Pradesh, India

### Abstract

In the present study, changes in compositional. Physic-chemical of khoa and paneer mixed gulabjamun. The objective of the present research was to increase the nutritional value of gulabjamun was evaluated on parameters such as protein, fat, ash, moisture, total solids there were four treatment and each were replication five times control (T<sub>0</sub>) was prepared by adding 100% khoa T<sub>1</sub> was prepared by adding 90% khoa and 10% paneer, T<sub>2</sub> was prepared by adding 85% khoa and 15% paneer and T<sub>3</sub> was prepared by adding 80% khoa and 20% paneer. The mean value of physic-chemical were evaluated of the optimized product and were found significantly (P<0.01) different with the control one the Fat (13.43), Protein (8.49), Moisture (37.50) Carbohydrate (40.72), Ash (1.36), Moisture (37.50). The developed product was found to be less as compared to that of control.

**Keywords:** gulabjamun, khoa, paneer, physic-chemical

### Introduction

India has emerged as the largest milk producing country of the World. Nearly 140\ Million metric tons/ year of milk are produced in India. Out of which, 44.5 per cent of milk is used as fluid milk and 55.5 per cent of milk is utilized for sweet making. Various traditional milk products like Rasogolla, gulabjamun, Sandesh and Misti Dahi are made in our country since ancient times because of their social, economic, religious, medicinal and cultural significance. Among these, gulabjamun occupies unique place in the array of Indian sweets Aneja, 1992 [1].

Milk has been an important food for human race from the historic period on ward. Aristotle described milk as a mixture of casein, fat and water. Now milk assumes a pivotal position in our diet and also as a good supplementary food for the adult. It is an important food for infants as well as adults.

*gulabjamun*, a popular *khoa* based sweet of India, is prepared from *khoa*, the traditional method of preparation involves blending of *khoa*, refined wheat flour (*Maida*) and baking powder to a homogeneous mass to obtain smooth dough along with small amounts of water. It made by frying *khoa* balls in *ghee* or vegetable oil and then dipping in sugar syrup of optimum concentration. Because of low shelf life and non-availability of *khoa* throughout the year, attempts were made to find out its substitute in the preparation of *gulabjamun*. The *gulabjamun* made from the commercial mixes is smooth and soft which finds some acceptance with consumers. But, the product lacks typical *gulabjamun* flavour and texture of the *khoa* based product.

Gulabjamun is a popular sweet prepared in all parts of India. Like other sweets, the manufacture of gulabjamun is also largely in the hands of halwa is who adopt small scale batch method. Though there is large variations in the sensory quality of gulabjamun, the most liked product should have

brown colour, smooth and spherical shape, soft and slightly spongy body free from both lumps and hard central core, uniform granular texture, mildly cooked and oily flavor, free from doughy feel and fully succulent with sugar syrup. It shall have optimum sweetness. It may or may not contain a piece of cashew nut in the center (Chetana *et al.*, 2004) [3].

Buffalo milk is preferred for preparation of *khoa* and *khoa* based sweets because it gives soft and uniform body with smooth, compact and homogenous texture. *Khoa* occupies a prominent place in traditional dairy products sector. It can be defined under PFA as the product obtained by rapid drying milk of cow or buffalo or goat or combination thereof. The milk fat content shall not be less than 20 per cent of finished product. Variety of *khoa* is produced in the market such as *pindi*, *dhap* and *danedar*. *Pindi* is used for preparation of *peda* and burfi, *dhap* is used for preparation of *gulabjamun* and *danedar* is used for *kalaknd*.

### Material's And Methods

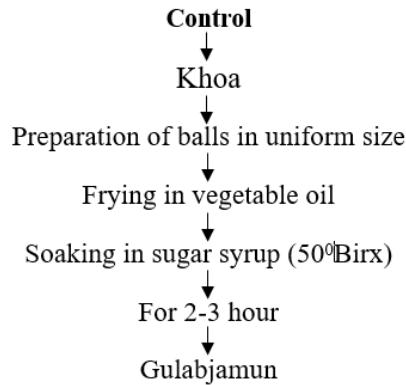
The experiment preparation of gulabjamun mixed by using Khoa and Paneer was carried out in the student's training dairy and research laboratory of warner college of Dairy Technology Sam Higginbottom University of Agricultural Technology and Sciences Allahabad, U.P.

### Procurement and collection of ingredient

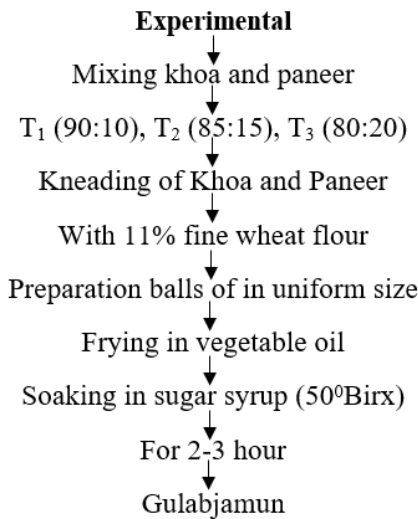
- **Khoa:** It was collected from Shoaat's dairy plant Allahabad
- **Paneer:** It was collected from Shoaat's dairy plant Allahabad
- **Sugar:** It was collected from local market of Allahabad
- **Maida:** It was collected from local market of Allahabad
- **Baking powder:** It was collected from local market of Allahabad.

**Treatment Combination**

- T<sub>0</sub>:** Gulabjamun mix prepared from khoa, maida, vanaspati ghee and baking powder.
- T<sub>1</sub>:** Gulabjamun mix prepared from khoa, paneer, maida, vanaspati ghee and baking powder in the ratio (90:10).
- T<sub>2</sub>:** Gulabjamun mix prepared from khoa, paneer, maida, vanaspati ghee and baking powder in the ratio (85:15).
- T<sub>3</sub>:** Gulabjamun mix prepared from khoa, paneer, maida, vanaspati ghee and baking powder in the ratio (80:20).



**Fig 1:** Preparation of Gulabjamun mix



**Fig 2:** Production of Gulabjamun from khoa and paneer mix

**Discussion**

The data collected on different aspects were tabulated & analyzed statistically using the methods of analysis of variance & critical difference. The significant & non-significant differences observed have been analyzed critically within & between the treatment combinations.

**Table 1**

Parameters	Treatments(Mean)			
	T <sub>0</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>
<b>1. Chemical analysis(in percent)</b>				
Moisture	35.07	36.04	36.51	37.50
Fat	13.58	13.43	13.00	12.97
Protein	8.54	8.49	8.45	8.29
Carbohydrate	41.48	40.68	40.72	40.00
Ash	1.34	1.36	1.32	1.24

**Moisture Content:** Moisture percentage in samples of control and experimental Gulabjamun

**Table 2**

Replications	Treatments			
	T <sub>0</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>
R <sub>1</sub>	36.09	37.85	38.95	38.66
R <sub>2</sub>	27.49	28.15	29.01	29.81
R <sub>3</sub>	36.91	38.28	37.5	38.95
R <sub>4</sub>	37.13	37.77	38.13	39.91
R <sub>5</sub>	37.71	38.16	38.97	40.15
Mean	35.07	36.04	36.51	37.50
Minimum	27.49	28.15	29.01	29.81
Maximum	37.71	38.28	38.97	40.15
F- test	S			
C. D. (P=0.05)	0.66			

Data Obtain from the analysis of Moisture content (%) in Gulabjamun samples of different treatments it has been observed that the mean moisture percentage was recorded in the Gulabjamun sample of T<sub>0</sub> (35.07), T<sub>1</sub> (36.04), T<sub>2</sub> (36.51), and T<sub>3</sub> (37.50) respectively.

**Fat:** Fat percentage in samples of control and experimental Gulabjamun

**Table 3**

Replications	Treatments			
	T <sub>0</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>
R <sub>1</sub>	13.5	13.5	12.125	12.75
R <sub>2</sub>	16.5	16.125	16.125	15.75
R <sub>3</sub>	13.125	12.75	12.75	12.375
R <sub>4</sub>	12.75	12.75	12.375	12.375
R <sub>5</sub>	12	12	11.62	11.62
Mean	13.58	13.43	13.00	12.97
Minimum	12	12	11.62	11.62
Maximum	16.5	16.125	16.125	15.75
F- test	S			
C. D. (P=0.05)	0.35			

Data Obtain from the analysis of fat (%) in Gulabjamun samples of different treatments it has been observed that the mean fat percentage was recorded in the Gulabjamun sample of T<sub>0</sub> (13.58), T<sub>1</sub> (13.43), T<sub>2</sub> (13), and T<sub>3</sub> (12.97) respectively.

**Protein:** Protein percentage in samples of control and experimental Gulabjamun

**Table 4**

Replications	Treatments			
	T <sub>0</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>
R <sub>1</sub>	8.487	8.475	8.4	8.356
R <sub>2</sub>	9.231	9.143	8.925	8.793
R <sub>3</sub>	8.668	8.531	8.443	8.443
R <sub>4</sub>	8.093	8.137	8.093	8.05
R <sub>5</sub>	8.225	8.181	8.368	7.831
Mean	8.54	8.49	8.45	8.29
Minimum	8.093	8.137	8.093	7.831
Maximum	9.231	9.143	8.925	8.793
F- test	S			
C. D. (P=0.05)	0.154			

Data Obtain from the analysis of protein (%) in Gulabjamun samples of difference treatments it has been observed that the mean protein percentage was recorded in the Gulabjamun sample of T<sub>0</sub> (8.225), T<sub>1</sub> (8.49), T<sub>2</sub> (8.45), and T<sub>3</sub> (8.29) respectively.

**Carbohydrate:** Carbohydrate percentage in samples of control and experimental Gulabjamun

**Table 5**

Replications	Treatments			
	T <sub>0</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>
R <sub>1</sub>	40.798	38.824	39.216	39.122
R <sub>2</sub>	45.428	45.336	44.601	44.447
R <sub>3</sub>	39.817	38.928	40.012	38.908
R <sub>4</sub>	40.696	40.047	40.102	38.396
R <sub>5</sub>	40.646	40.267	39.661	39.109
Mean	41.48	40.68	40.72	40.00
Minimum	39.817	38.824	39.216	38.396
Maximum	45.428	45.336	44.601	44.447
F- test	S			
C. D. (P=0.05)	0.68			

Data Obtain from the analysis carbohydrate (%) in Gulabjamun samples of different treatments it has been observed that the mean carbohydrate percentage was recorded in the Gulabjamun sample of T<sub>0</sub>(41.48), T<sub>1</sub>(40.68), T<sub>2</sub>(40.72), and T<sub>3</sub>(40.00) respectively.

**Ash:** Ash percentage in samples of control and experimental Gulabjamun

**Table 6**

Replications	Treatments			
	T <sub>0</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>
R <sub>1</sub>	1.124	1.351	1.309	1.112
R <sub>2</sub>	1.351	1.246	1.339	1.2
R <sub>3</sub>	1.48	1.511	1.294	1.323
R <sub>4</sub>	1.331	1.296	1.3	1.269
R <sub>5</sub>	1.419	1.392	1.381	1.29
Mean	1.34	1.36	1.32	1.24
Minimum	1.124	1.246	1.294	1.112
Maximum	1.48	1.511	1.381	1.323
F- test	NS			
C. D. (P=0.05)	-			

Data Obtain from the analysis ash (%) in Gulabjamun samples of different treatments it has been observed that the mean ash (%) was recorded in the Gulabjamun sample of T<sub>0</sub>(1.34), T<sub>1</sub>(1.36), T<sub>2</sub>(1.32), and T<sub>3</sub>(1.24) respectively

**Conclusion**

The food and nutritive value of khoa is very high. It contains fairly large quantities of muscle-building protein, bone-forming minerals and energy-giving fat and lactose. It is also expected to retain most of fat soluble vitamins A and D and also fairly large quantities of water-soluble B-vitamins contained in the original milk. As paneer has a fairly fat and protein content, and also contains some minerals, especially calcium and phosphorus, its food and nutritive value is fairly high. It is also a good source of fat-soluble vitamins A and D (with its high protein and low sugar content, paneer is highly recommended for diabetic patients). Dairy foods are nutrient dense foods providing abundant amounts of protein, vitamins, and minerals necessary for growth and development. From the finding of this study under taken, it was concluded that treatment T<sub>1</sub> which was prepared by khoa and paneer in a ratio of 90:10 showed better quality because its highest softness (lowest hardness) during rheological analysis as compared to other treatment. Treatment T<sub>1</sub>

showed highest fat percentage as compared to other treatment. Treatment T<sub>2</sub> showed highest carbohydrate percentage as compared to other treatment.

**Acknowledgement**

The author would like to thank advisor Prof. (Dr.) Sandeep G. M Prasad Associate Professor WCDT, SHUATS, Allahabad, for providing proper guidance and all required facilities. I would also like to pay my plethora of thanks to my Friend Dr. Kaushal Kishor, Assistant professor G.S. degree college Allahabad State University Allahabad for his dedication, cooperation and prolific encouragement in accomplishing my work.

**Reference**

1. Aneja PR. Traditional milk specialties: A Survey. Dairy India, 1992, 259-275.
2. Anoop Singh, Kaushal Kishor, Sandeep Prasad GM, Smita Majumder. Sensory analysis of Gulabjamun prepared by Khoa and Paneer Journal of International Journal of Food Science and Nutrition. 2019; 4:66-68.
3. Chetana R, Manohar B, Reddy SRY. Process optimization of Gulabjamun, an Indian traditional sweet, using sugar substitutes. European Food Res. Technol. 2004; 219:386.
4. Dewani PP, Jayprakash HM. Effect of preconcentration of milk quality of Khoa and Gulabjamun. India J Dairy & Biosci. 2002; 13(2):53-59.
5. Ghube SD, Bidwe KU, Shelke RR, Shegokar SR. Studies on physico-chemical properties of Gulabjamun prepared from cow milk Khoa blended with wheat bran, Research Journal of Animal Husbandry and Dairy Science. 2015; 6(2):99-104.
6. Kaushal Kishor, John David. Determination Of Shelf Life And Sensory Analysis Of Value Added Cottage Cheese With Different Levels Of Chick Pea (Cicer Aritinum) Milk And Turmeric Powder Journal of Multilogic In Science. 2017; VI:XIX.
7. Londhe GK. Comparative studies on the use of different binders flours on the quality of gulabjamun. M. Sc. (Agriculture) Thesis, Submitted to Vasant Rao Naik Marathwada Vidyapeeth, Parbhani, Maharashtra, 1995.
8. Manvendra Singh, Rai DC, Ashok Kumar Yadav. Sensory and textural profile analysis of low calorie fiber enriched herbal gulabjamun Journal of Pharmacognosy and Phytochemistry, 2018, 974-980.
9. Patil HS. Studies on formulation of Gulabjamun from goat milk. M.Sc. (Ag.) Thesis, Marathwada Agricultural University, Parbhani, M.S. (India), 2002.
10. Yawale PA, Rao JK. Development of Khoa powder based Gulabjamun mix. Indian Indian Journal of Dairy Science. 2012; 65(5):361-367.