

# Development and Nutritional Analysis of Makhana Enriched Turmeric Flavoured Shrikhand

**Kaustubh Isal, Miss. Varsha Chawla, Mr Hanmant Bodhankar**

Students, Professor, Head of Department

Department of Food Technology

Parul Institute of Applied Sciences, Parul University, Vadodara, Gujrat, India

**Abstract:** *The interest in development of makhana enriched turmeric flavoured shrikhand came due abundance nutritive qualities of makhana and medicinal values of turmeric. Studies were carried out with traditional methods of preparing shrikhand. Further makhana powder added with 5.5%, 6.5%, 7.5% in 500ml milk while heating. Turmeric powder added with 0.5%, 0.8%, 1%, percentage treatments and 50 ml honey as sugar added based on weight of chakka. The sensory evaluation revealed that 80% of the panellist extremely like T3 combination as compared T1 and T2. Adding makhana and turmeric powder had positive effect in enhancing nutritive value phosphorus, protein, potassium, carbohydrates coupled with improved sensory parameters, colour, appearance, flavour, physicochemical and nutritional facts and over all acceptability scores when compared to that of control.*

**Keywords:** Shrikhand, Makhana, Turmeric, Enriched

## I. INTRODUCTION

Shrikhand is an acid coagulated semi-solid-soft, sweetish-sour fermented dairy product. It is prepared from either cow, buffalo or mixed milk. which is popular delicacy in the states of Gujarat, Maharashtra and partly in Karnataka. This indigenous dairy product is prepared by lactic coagulation of milk and expulsion of whey from the curd, followed by blending of sugar, flavour and spices. To increase the basic qualities of Shrikhand it can be enriched or fortified with various consumable extracts which are potentially beneficial to health which aims to enhance nutritive value of Shrikhand. As Makhana is used for making, shrikhand it also has high nutritive property. Makhana is a good source of protein, fibre, along with micronutrients like calcium, iron and phosphorus. It contains good number of nutritive contents. Turmeric powder contains high medicinal value which were used for enrichment of shrikhand. As makhana and turmeric were chosen for enrichment which are known for their nutritive and medicinal applications. These nutritive extracts will impart their properties to shrikhand and hence consumption of such enriched shrikhand would give tremendous health benefits compared to regular ones.

## II. MATERIAL AND METHODS

Fresh Amul A2 buffalo milk pack was procured from smart point vadodara. For curd preparation starter culture was prepared instantly and used. all work related contamination prevention was done. Makhana powder was prepared and used, Patanjali honey as sweetener. Amul curd, muslin cloth and turmeric powder was purchased from local market of vadodara. Below mentioned are methods of preparing makhana powder, and starter culture and applications of it.

### 2.1 Preparation of Makhana Powder

Since from a long time makhana has been a promising source of calcium, carbohydrates which makes it nutritionally distinct from other nuts. Highly rich in protein, carbohydrates, fibre, magnesium, potassium, phosphorus, iron and zinc. Better than dry fruits like almonds, walnuts, coconut and cashews in terms of sugar, protein, ascorbic acid and phenol content. 15 grams of makhana was weighted and slightly roasted in aluminium pot for removal of moisture present within it. After cooling makhana was added to mixer grinder pot and grind into fine powder texture. Obtained fine powder of makhana will be further added to boiling milk

## 2.2 Heating of Milk and Addition of Makhana Powder

Milk and dairy products are highly nutritious and plays vital role in human diets for both children and adults. Milk is also a very good source of riboflavin and vitamin A and fair source of thiamine and vitamin C. Buffalo milk has a higher fat, protein, lactose, vitamin, and mineral content than cow's milk. It's also whiter and has a thicker consistency, which makes it perfect for the production of fat-based dairy products. About 500ml of milk was strained and heated in container with continuous stirring for maintaining creamier texture of milk. As milk starts boiling turn of gas burner and stir milk continuously. Give water bath to container containing milk which will help in lowering temperate to luke warm quickly. As milk meets luke warm temperature add makhana powder to it and mix well.

## 2.3 Preparation of Starter Culture

Curd is obtained by coagulating milk in a sequential process called curdling. It can be a final dairy product or the first stage in cheesemaking. The coagulation can be caused by adding rennet or any edible acidic substance such as lemon juice or vinegar, and then allowing it to coagulate. Milk converts to curd due to production of lactic acid this process of conversion of milk to curd occurs due to the action of bacteria lactobacillus that form lactic acid from sugar present in the milk lactobacillus is a genus of gram positive bacteria anaerobes that are rod shaped and do not form spores. It reduces the pH of milk and convert lactose into lactic acid which imparts the sour taste to curd. Take 50g of curd in a cup and add 10ml water in it and whisk well to convert curd into liquid form. This liquid form of curd gets mixed evenly in milk. When milk meets luke warm temperature with continuous stirring add created starter frequently in small amount so that it gets mixed evenly, stop stirring when mixed cover container with lid. Let it rest for 6hr at room temperature for development of curd. Once curd is developed transfer container to refrigerator for 2-3 hr for proper curd setting. Curd is ready to eat as well as for utilization in further process.

## 2.4 Preparatory Trials

The preparatory trials were completed with 3 levels of makhana powder and turmeric powder. Makhana powder is added 1.2%, 2.4%, 3%, by volume of milk. Turmeric powder is added 0.5%, 0.8%, 1% by weight of chakka. Honey percentage was taken constant at 25% by weight of Chakka. Honey and makhana powder are added before turmeric powder. It was obtained that 0.8% turmeric powder and 2.4% makhana powder gives suitable test. 1.2 % makhana powder does not give any change in test. 2.4% gives low change in test and colour. 3% makhana powder gives desirable and acceptable test and appearance. Turmeric powder with 0.5%, 0.8% gives lead change is colour and taste. 1% quantity of turmeric powder gives suitable colour.

### A. Details of Treatment

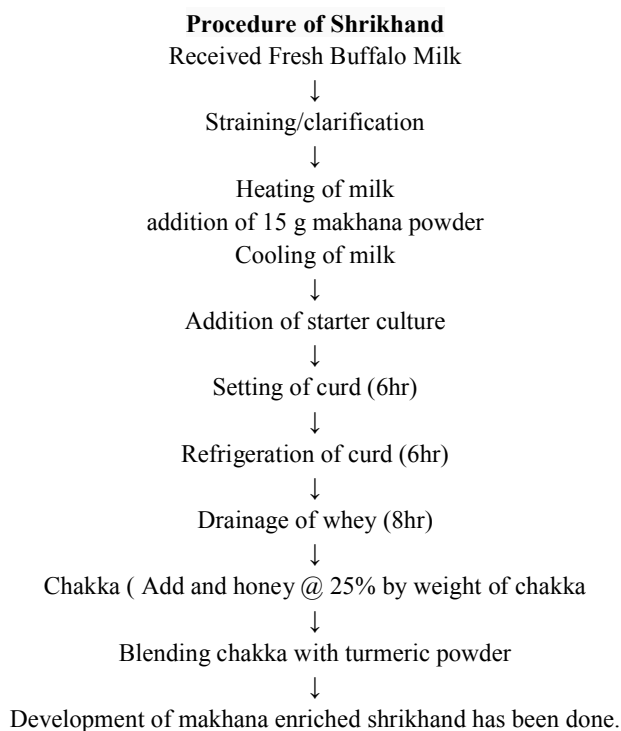
After preparing different trial formulation percentage of chakka and honey will be same only changes with makhana and turmeric will take place. As per previous trial T2 and T3 formulation are acceptable.

**Table 1:** Sample trial formulation

Sr No	Ingredients	Trial 1 (T1)	Trial 2 (T2)	Trial 3 (T3)
1	Curd(chakka)	200g	200g	200g
2	Honey	50ml	50ml	50ml
3	Makhana	6g	12g	15g
4	Turmeric	1g	1.6g	2g

### B. Preparation of Shrikhand

Manufacturing is carried out by draining whey out from curd properly and formed chakka is then blended with two other ingredients honey as sweetener and turmeric powder. Ingredients utilised in shrikhand production with 200g chakka, 50ml of honey, and varying ratios of makhana and turmeric



**Figure 1:** Makhana enriched turmeric flavoured shrikhand

**Table 2:** Sensory analysis report

Sample	Sensory Evaluation of Makhana enriched Turmeric flavoured Shrikhand					
	Appearance	Aroma	Colour	Taste	Mouthfeel	Overall Accept
Neutral T0	8	8	8	8	7	8
Trial T1	5	3	5	3	5	5
Trial T2	7	7	7	8	7	7
Trial T3	9	9	9	9	8	9

**Table 3:** Nutritional facts per 100g of serving of makhana enriched turmeric flavoured shrikhand.

Energy	185Kcal
Total fat	9g
Saturated fat	6g
Carbohydrates	18g
Total sugar	15g

Protein	8g
Sodium	10mg
Cholestrol	5mg
Iron	1.1mg
Pottasium	80mg
Calcium	30mg

Values mentioned in above tables results that shrikhand contains low sugar content, low cholestrol, low carbohydrates low in sodium, which is beneficial for person suffering from heart realted issues, and can be consumed by daiabetic persons, where protein helps in building mass muscles.

#### IV. RESULT AND DISCUSSION

Shrikhand was prepared by using different values of makhana and turmeric powder. The acceptability of shrikhand was judged by panel of judges. Sensory analysis was done with 9 point hedonic scale. Several prepatory trails were done with different ratios of formulation results were obtained with help of sensory analysis. Treatment 1 was not acceptable because of loss in consistency and taste. Treatment 2 was acceptable but was still lacking in texture and mouthfeeland slightly in consistency, where as Treatment 3 was mostly liked as it ticked all boxes colour appearance taste mouthfeel, texture, aroma. overall there was significant difference in acceptability scores observed in different treatment combination. Maximum overall acceptability score 9 was found in the treatment T3 followed by treatments T2 ranges 7, T1 ranges 5 T0 ranges 8.

#### IV. CONCLUSION

The present work was carried out to develop and analyse nutritional qualities of makhana enriched turmeric flavoured shrikhand. while study got to know that shrikhnad prepared with combination of makhana and turmeric contains contains low sugar content, low cholestrol, low carbohydrates low in sodium, which means product is beneficial for person suffering from heart realted issues, and can be consumed by daiabetic persons, as well, where protein helps in building muscles, and promotes heart health. Honey as a replacement of sugar was added for preparation of shrikhand. it was found that it product is health beneficial and nuritive. It can be consumed in any season because of its medicinal values it is comparitively cheaper and simple in treatment for preperation.

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