



# To Standardization Of Yoghurt Fortification By Sapota Powder And Honey

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**Abstract:** Milk preservation by fermentation is an old age technique. Yoghurt fortified by sapota powder and honey is a soft, smooth, sweet-sour, whole milk product, prepared from lactic fermented curd. It is nutritionally dense fermented milk and fortified product. Its nutritional and therapeutic value can further be enhanced by incorporating filled milk, fruit pulp, fruits powder or probiotics. They are highly nutritious product because of increased vitamin content as selective cultures are being used in preparation of chakka. The basic aim of the study was "To standardization of yoghurt fortification by sapota powder and honey." Yoghurt was prepared using as per the standard method using activated culture of *L.bulgaricus* and *S.thermophilus* and sapota powder 25%(T1), honey 25%(T1) and 50% (T1) chakka while Control sample T0 was prepared without addition of sapota powder and honey and stored for 30 days at 4°C. Proximate composition of raw materials, Sensory attributes, Physico-chemical constituents and Microbiological analysis was analysed from prepared product and data collected from that were tabulated. The range of acidity for fortified yoghurt incorporated with sapota fruits powder and honey was found to be 2.09 and 2.34 for treatment T0 to T1, respectively and the pH range for sapota powder & honey fortified yoghurt was 4.82 to 5.12 per cent, respectively. The protein content for sapota powder & honey fortified yoghurt was 7.16 and 8.50 per cent for treatment T0, and T1 respectively and the fat content of sapota powder & honey fortified yoghurt was 7.28 and 8.73 per cent for treatment T0 to T1 respectively. The moisture content of sapota powder & honey fortified yoghurt was found to be 56 and 54 percent for treatment T0 to T1 respectively and the range of TSS was found to be 9.7 and 16 per cent for treatment T0, and T1 respectively. The ash content of prepared sapota powder & honey fortified yoghurt 2.38 and 2.82 per cent for treatment T0 to T1 respectively and sucrose content was 0 and 14.25 percent for treatment T0 and T1 respectively. Storage study of sapota powder & honey fortified yoghurt (absence of yeast and mold) had good storage stability during 30 days of storage at refrigeration temperature (4°C). Sensory analysis showed a significant difference in different sensory attributes of T1 sample with the rest of the treatments. T(25)honey and T1(25) supplementation of sapota powder to fortified yoghurt was much preferred. Hence, yoghurt fortification by sapota powder and honey can provide therapeutic benefits to the consumer with longer shelf life.

**Index Terms - Chakka, Honey, Lactic Acid Bacteria, Milk, , Sapota Powder.**

## I. INTRODUCTION

Yogurt and fermented milk products are among the most famous dairy ingredients eaten all over the world. The acidic pH of yoghurt ionises calcium and, as a result, facilitates intestinal calcium absorption. Various researchers have demonstrated the fortification of yoghurt with a number of calcium salts. In the processing of flavoured yogurt, herbal fruits may be used. Yogurt is a fermented milk product that has many fitness advantages and is therefore rather viewed by dairy researchers. The blended impact of *Lactobacillus delbrueckii bulgaricus* and *Streptococcus thermophilus* organisms is nicely described in yoghurt by its taste and texture. Recent buyers are interested in eating meals that provide more than just nutrition; they also need to provide fitness benefits such as cholesterol reduction, high blood pressure reduction, anti-diabetic benefits, and so on. Yoghurt is a cultured dairy product produced by fermenting milk with or without added nonfat dry milk with *Lactobacillus bulgaricus* and *Streptococcus thermophilus* bacteria. It typically incorporates 12-14 per cent total milk solids and has smooth friable custard like consistency and a clean wonderful flavor. The word "yoghurt" is derived from the Turkish phrase "jugurt" and is a regular food beverage in the Balkans and Middle East. However, its popularity has additionally spread in India. Sapota is native to Central and South America, especially from the Yucatan Peninsula of Mexico to Costa Rica. Sapota is grown on commercial grounds in India, the Philippines, Sri Lanka, Malaysia, Mexico, Venezuela, Guatemala, and different Central American countries. The ripe fruits contain seventy-two to 78% moisture content (w.b.) and the Total Soluble Solids (TSS) range from 12 to 18 °Brix.

## II. MATERIALS

Freeze-dried probiotic live culture (*Streptococcus thermophilus* and *Lactobacillus delbrueckii* subsp. *Bulgaricus*), Buffalo milk, sapota fruits, honey, culture were purchased from local market of vadodara, gujrat.

## III. MATHODE

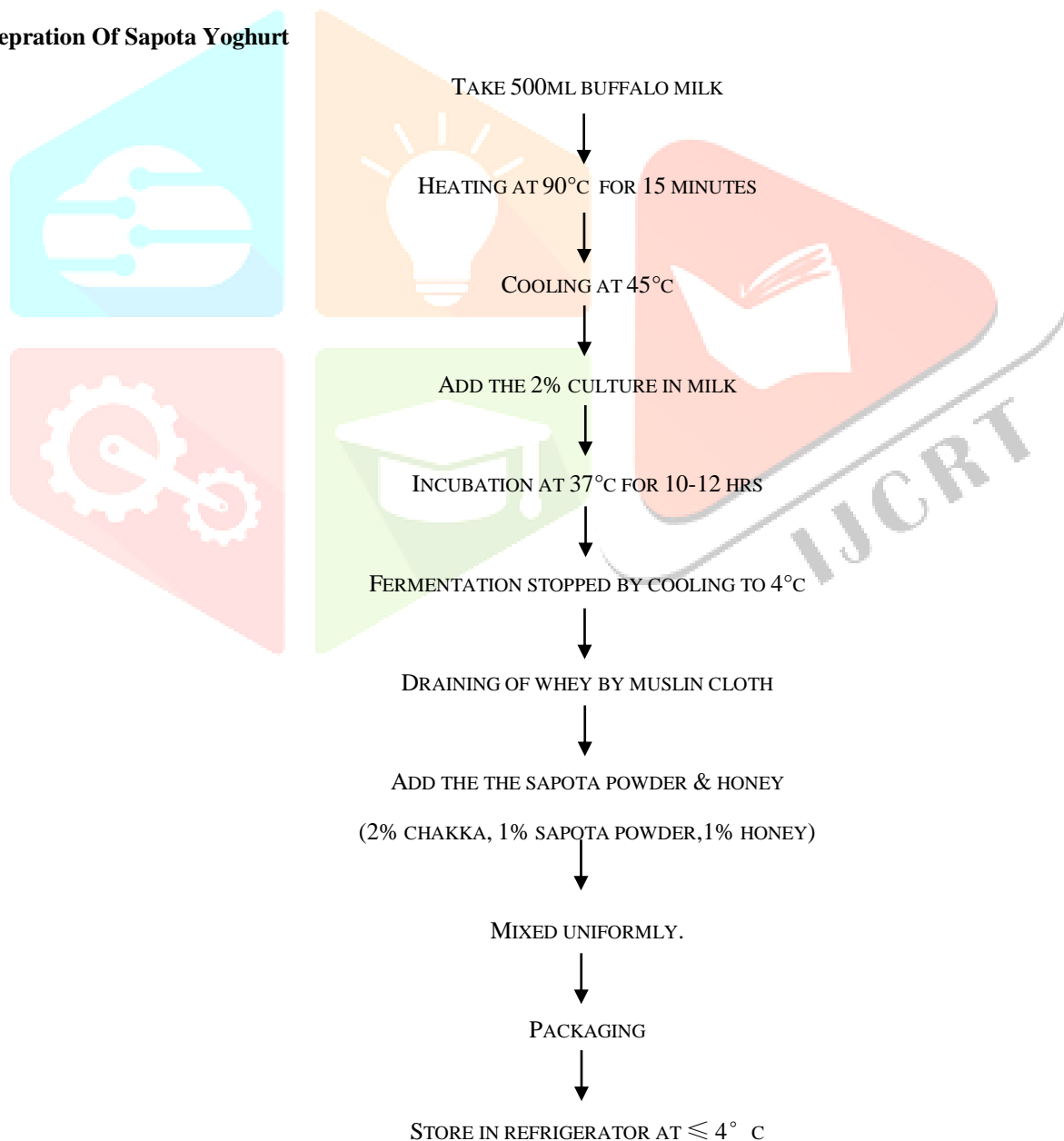
### A. Peppreparation Of Freeze-Dried Culture

To Prepare a Lactobacillus MRS broth (100ml) – take 100ml distilled water in a clean and sterilized 500ml conical flask. Weigh 6.75 gms of MRS Powder and add to the taken distilled water in a conical flask. Close the mouth of the conical flask with cotton cork and autoclave for 15 min at 121°C. Select the freeze-dried culture of *Lactobacillus delbrueckii* and *Streptococcus thermophilus* and weigh 2gm. Inoculation of culture in MRS broth - Add the weighed freeze-dried culture to the sterilized broth. Incubation at 37°C for 68 - 72 hrs. Obtained growth in broth. Centrifugation to collect the bacteria pellets at 4500rpm for 30 mins and store the pellets in Eppendorf tubes at  $\leq 4^{\circ}\text{C}$ . Addition of bacteria pellets to the pasteurized amul milk.

### B. Prepration Of Sapota Powder

Take fresh and clean sapota fruit, cut into thin slices, and place them in your Excalibur dehydration tray. Dehydrate the fruit slices at 125°F for 24-48 hours, or until completely dry. Dry slices are added to the grinder to make a smooth powder.

### C. Prepration Of Sapota Yoghurt



#### D. Sensory Analysis

The sensory assessment was conducted out on prepared products with various ratios of sapota powder and honey taste, and each was evaluated to a control product using a 9-point hedonic scale. Flavor, body and texture, colour and look, and general acceptance were all assessed using a standard scoring card.

#### E. Physico-Chemical Analysis

pH, acidity, moisture content, total solid content, ash content, fat content, protein content. All property analyses were carried out in accordance with AOAC standards.

#### F. Microbial Analysis

Microbial analysis of ice cream was done with three different tests.

- 1) yeast and mould count
- 2) coliform count
- 3) viability count

### IV. MATHODE

#### A. Sensory Evaluation

Fig 1 sensory attributes color of the T0 was 7.83 whereas for the experimental sample T1, T2 the score were 8.73, 8.06 was observed. Appearance of the T0 yoghurt was 6.86, whereas for the experimental sample T1, T2 the score were 7.87, 7.43 was observed. Taste of the T0 yoghurt was 7.68, whereas for the experimental sample T1, T2 the score were 7.72, 7.12 was observed. Flavor of the T0 yoghurt was 7.19, whereas for the experimental sample T1, T2 the score were 7.34, 7.13, was observed. Consistency of T0 yoghurt was 7.22, whereas for the experimental sample T1, T2 the score were 7.43, 7.26 was observe. Including all overall acceptability of T0 yoghurt was 7.78, whereas the experimental sample T1, T2 the score were 7.24, 8.42 was observed.

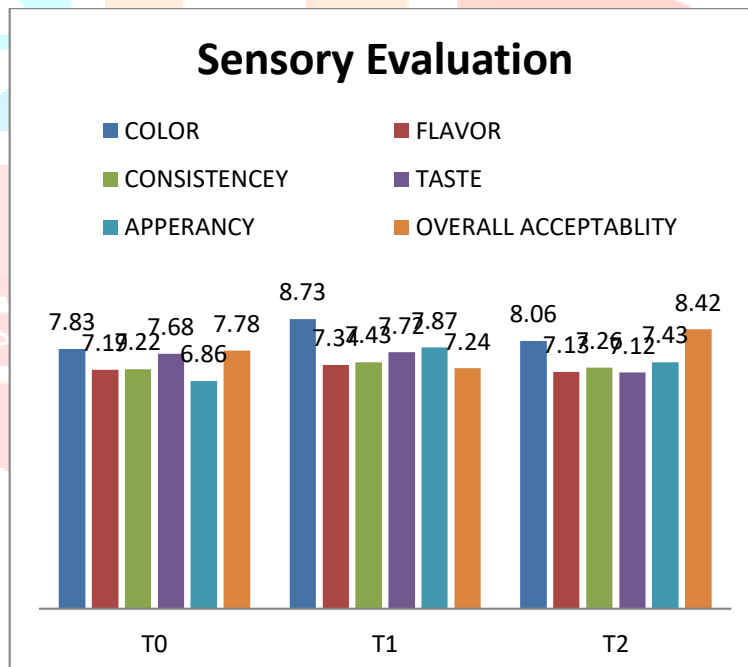


Fig. 1. Sensory analysis

#### B. Physico-Chemical Analysis

Fresh buffalo milk used for in making of sapota yoghurt was analyzed for proximate composition like pH, acidity, moisture, fat, protein. And then prepared product was analyzed for physio-chemical constituents such as pH, Acidity, Moisture, Total solid, Ash, Fat, Protein, calcium.

**Table 1** Proximate analysis of sapota powder and honey yoghurt.

pH	5.12
Moisture (gm%)	54.18
Total solid (gm%)	16.64
Titration acidity (%)	0.86
Ash (gm%)	0.95
Protein (gm%)	8.50
Lactose (gm%)	5.28
Fat (gm%)	0.80
Calcium (gm%)	58.28
Carbohydrate (gm%)	21.18

Table 1 shows the proximate analysis of yoghurt which contains pH of 5.12, moisture (54.18%), content, total solid (16.12gm%), titration acidity at 0.86 %, where titration acidity varies from 0.86 to 0.95% in fresh buffalo milk and ash is 0.95, protein is 8.50, and percentage of fat present in yoghurt was 0.80 gm %, lactose is 58.28 gm% and calcium percent was 21.18%.

### C. Physico-Chemical Properties

Stop the fortification of yoghurt with sapota yoghurt powder ", for proximate analysis, sensory, physio-chemical and microbiological analysis. Where it shows the amount of acidic pH from T2 treatment (4.52), the highest acidity percentage in T2 (0.99), the increase in the percentage of high moisture in T0 (58.64), the level of total solid content has dropped dramatically. T0 (29.76). In addition, the yoghurt ash content of the sap was high with T2 treatment (0.95), high fat content was observed in T2 (1.03), high protein content in T1 (8.50), These physio-chemical parameters were observed and sapota powder. stored in a cool place (-18 °c). From the current research it can be concluded that Sapota powder offers excellent use in the dairy industry to enrich dairy products. A mixture of sapota powder for T1 treatment is more acceptable than other T2 test treatments due to high overall acceptance points. It was noted that as the increasing level of sap and honey flour increased and in Weight, Acidity, protein, ash, fat and pH decreased, total yogurt intensification enhanced by sap powder and honey.

### D. Microbial Analysis and Shelf Life of Product

#### 1) Yeast And Mould Count

The yeast and mould growth in sapota yoghurt was analyzed at the regular intervals viz., 10th, 20th and 30th days of storage. Initially there was no yeast and mould growth in sapota yoghurt thus, yeast and mould were absent in fresh yoghurt. Then on 15th day of storage in one experimental (T1 -10<sup>4</sup>) sample there was no colony was observed on plate and after that at 30th day (T2-5th dilution, T1-10<sup>4</sup> dilution) of storage no growth were seen on plate.

#### 2) Coliform Count

In each treatment of prepared yoghurt, the coliform count was nil which indicates that hygienic conditions adapted during manufacturing as well as the sanitation was carried out which was adequate.

#### 3) Viability

Only a cluster of colonies was observed in experimental samples T1 (10<sup>8</sup>dilution) which was uncountable due to the enormous cluster. After 15 and 30 days of storage it remained same uncountable in T2 (10<sup>9</sup> dilution) and skeptical to identify and to count, hence it was a fallible result.

### G. Cost Of Production Of Sapota Powder And Honey Yoghurt

The cost of sapota yoghurt is made considering the existing cost of the ingredients only. Cost data is presented in Table 5.

**Table 2** Organoleptic evaluation of sapota yoghurt

Sample	Color	Consistency	Taste	Flavor	Appearance	Overall acceptability
T0	7.83	7.22	7.68	7.19	6.86	7.78
T1	8.73	7.43	7.72	7.34	7.87	7.24
T2	8.06	7.26	7.12	7.13	7.43	8.42

**Table 3** Physiochemical properties of sapota yoghurt

Sample	pH	Acidity	Moisture	Total solid	Ash	Fat	Carbohydrate	Protein
T0	4.78	1.02	58.64	29.76	0.74	0.40	2.80	7.16
T1	5.12	0.86	54.18	16.64	0.82	0.80	21.18	8.50
T2	5.02	0.99	54.92	15.69	0.95	1.03	22.86	8.21

**Table 4** Changes in microbial activity during storage of sapota yoghurt

Microbial quality	0 day			15 day			30 day		
	C	E		C	E		C	E	
	-	10 <sup>8</sup>	10 <sup>9</sup>	-	10 <sup>8</sup>	10 <sup>9</sup>	-	10 <sup>8</sup>	10 <sup>9</sup>
Viability	-	-	-	UC	-	-	-	UG	UG
Yeast and mold count	-	-	-	-	-	-	-	-	-
Coliformcount	-	10 <sup>2</sup>	10 <sup>3</sup>	-	10 <sup>2</sup>	10 <sup>3</sup>	-	10 <sup>2</sup>	10 <sup>3</sup>
	-	-	-	-	-	-	-	-	-

\*C- control, \*E-experimental \*UC- uncountable, '-'= Nil

**Table 5** Cost of production of sapota yoghurt

Ingredients	Sapota yoghurt treatments					
	T0		T1		T2	
	Qty	Cost	Qty	Cost	Qty	Cost
Milk	480 ml	25.68	120 ml	6.42	120 ml	6.42
Freeze-dried probiotics	50 mg	5	50 mg	5	50 mg	5
Sapota powder	-	-	25 gm	7.14	30 gm	8.57
Honey	-	-	25 gm	15.5	20 gm	12.4

## V. CONCLUSIONS

The present study was under taken for "To satandardization of yoghurt fortification by sapota powder and honey", for proximate, sensory, physio-chemical and microbiological analysis. The study was divided into six phases commencing with collection of raw materials, sample preparation and raw material preparation. After developing the product, physiochemical analysis of product was done and then finally in the last sixth step microbiology analysis of different experimental and control treatments was done. According to the sensory attributes all different treatments were accepted. Results obtained were satisfactory and the fortified yoghur showed good quality characteristics on pH, Acidity, Moisture, Total solid, Ash, Fat, Protein, Lactose and moisture. Sapota powder can be very well utilized by drying and grinding it in ratios with buffalo milk containing 8.5% fat, a starter culture of *L.helveticus* and *S.thermophilus* strain added to yogurt and then yogurt is added in 1:2 ratio. It can be recommended as health food for patients due to its lower fat content and being a probiotic such type of yoghurt will be beneficial to health conscious people. Yoghurt fortification by sapota powder and honey can be stored for 30 days due to absence of yeast and mold was also lower.



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