

QUALITY PARAMETERS OF KULFI BY UTILIZING DIFFERENT COMBINATIONS OF (OCIMUM BASILICUM) BASIL

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ABSTRACT

In the current study, an effort has been made to create a herbal kulfi by varying the amount of Ocimum basilicum included in, and to assess how adding basil extract would affect microbiological quality. The kulfi samples from various treatments and controls underwent physico-chemical analysis to determine their nutritional content and safety. Organoleptic characteristics, such as flavor and taste, body and texture, color, and appearance, were also assessed using a trained panel list and a nine-point hedonic scale. The therapies using basil extract at 7% strength receive the highest rating. The shelf life of the best therapies T2 was evaluated microbiologically and was confirmed using SPC, yeast and mold count, and presumptive coli form test. When compared to the PFA standards, the results showed a yeast and mold count less than 100/g (standard value) and a negative coli form test. The treatment can be rated as T2>T0>T1>T3 in terms of product acceptance as determined by organoleptic evaluation and therapeutic value.

Keywords: Basil, Kulfi, Coliform, Yeast and Mould, SPC,

1. INTRODUCTION

An Indian indigenous frozen dairy product, which is consumed specially in summers, is known as *Kulfi* or *Malai Kulfi*/ *Malai-ka-burf*. It closely resembles an ice cream in composition but it is not the same. The liking for ice cream in India and hence its consumption has tremendously increased in big cities and towns in the recent past. "After a long time, it was realized that there is a need to develop the indigenous product, as they have ready market in India" (Aneja *et.al.*, 2002). "Simply stated, overall goal of designing the ice cream is to incorporate several different insoluble's (air bubbles, ice crystals and fat globules) into an aqueous phase in the smallest sizes and in the greatest number possible" (Sharma and Hissaria, 2009). "Kulfi has nutritional significance but possess no therapeutic properties. The growing interest of consumers towards therapeutic products" (Hoji, 1982). *Ocimum basilicum*, a member of the Lamiaceae family, is one of the most widely cultivated plants in the world. It is mostly grown in Asia,

Europe, and North America. It is thought that India or Iran are where basil first appeared. The species *O. basilicum* is the most widely farmed cultivar in the world, out of at least 150 species that belong to the genus. The leaves and petals of basil have been used to cure headaches, coughs, diarrhea, worms, and kidney problems, as well as for their carminative, galactagogue, stomachic, and antispasmodic characteristics. Basil has been cultivated as a common culinary and medicinal herb since ancient times. The present investigation on qualitative properties of selected herbs has been done for achieving the following objective:

1. To study the optimisation of manufacturing process of herbal *Kulfi*,
2. To assess the Organoleptic, Physico-chemical and Microbiological quality of the new formulation herbal *Kulfi*, and
3. To evaluate the cost of formulation of improved herbal *Kulfi*.

2. MATERIALS AND METHODS

The present experiment was completed in the Lab of Student Training Dairy of Warner School of Food and Dairy Technology, Sam Higginbottom Institute of Agriculture, Technology & Science, Deemed to be University, Allahabad (U.P.).

For this purpose, the Basil leaves were procured from the local area market of the town Allahabad. Other required materials were, skimmed milk powder of Anik spray brand, sugar crystals, stabilizer, emulsifier and nuts which were also purchased from the local market of Allahabad town.

3. TREATMENT

T₀ control treatment the *Kulfi* mix was set to a standard of 10% fat, milk solids not fat 12%, sugar 15%, 0.3 % of stabilizer and 0.2% emulsifiers. Experimental treatment *Kulfi* mix was standardized to 10% fat, milk solids not fat 12%, 0.3% of stabilizer, 0.2 % emulsifiers, the rate of addition of sugar 15% with Basil leaf extract 3%, 5%, 7% respectively in T₁, T₂, T₃, as a source of MSNF the skimmed milk powder was also mixed, so that the formulation consists of 37% total solids.

Physico - Chemical Analysis:

Percentage fat in frozen dessert- The percentage of fat in *Kulfi* was set as per I.S. 2802 (1964)

Determination of total solids -Total of solids in the plain *Kulfi* as well as probiotic *Kulfi* were set gravimetrically as per the procedure laid down in dairy chemistry manual, ICAR Publication and in **IS: 1479, Part: II, 1961 (20)**

Determination of moisture-The percentage of moisture in *Kulfi* was set as per procedure laid down in **IS.1165 (1957)**.

Moisture percentage in skimmed milk powder-The percentage of moisture in skimmed milk powder was set determined as per **I.S.1165 (1957)**.

Percentage of Acidity- The titratable acidity (expressed as lactic acid) of the plain *Kulfi* and probiotic *Kulfi* samples was set as per the procedure laid down in **IS: 1479, Part: I. (1960)**

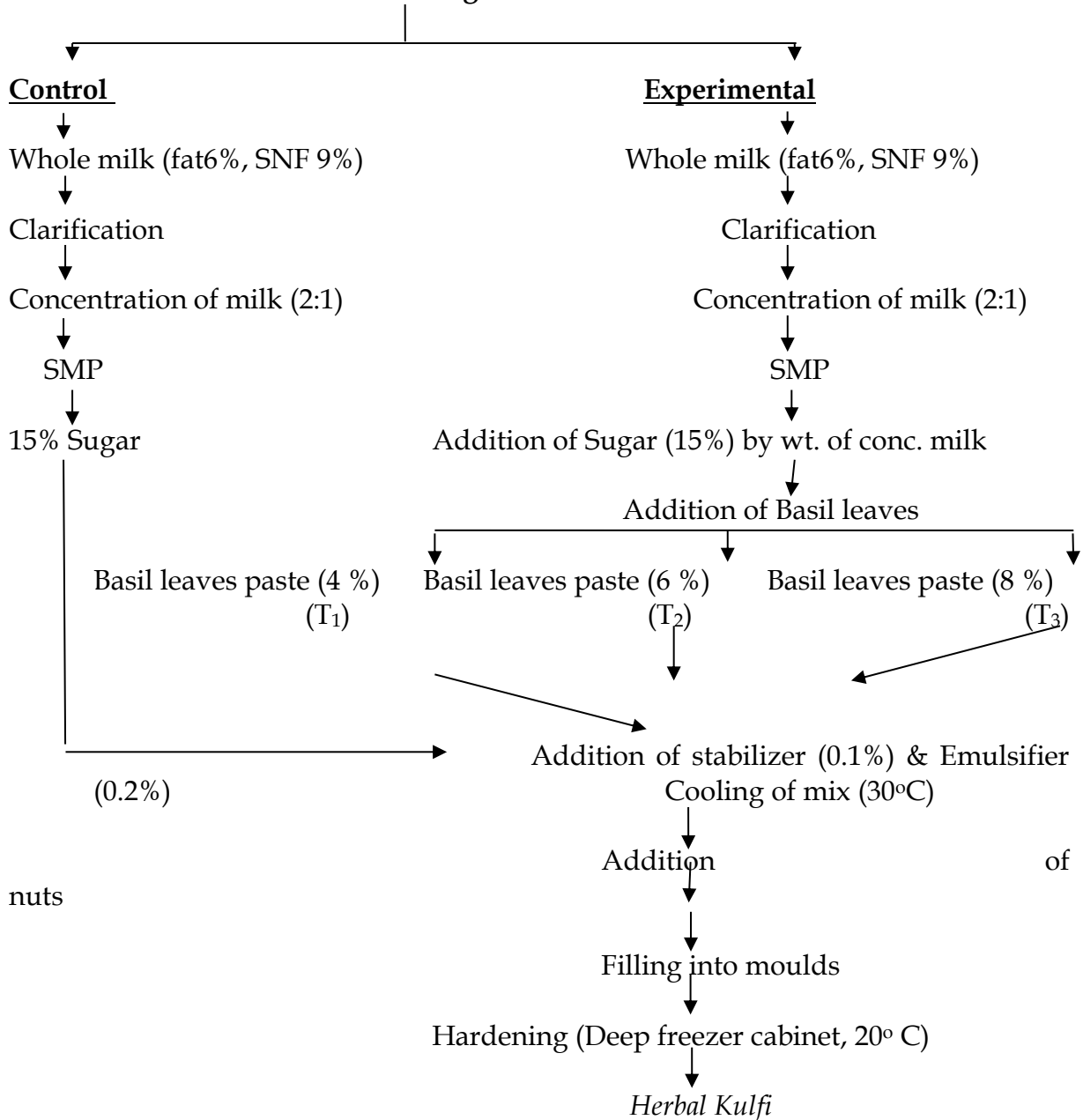
Organoleptic evolution- For organoleptic quality, i.e., flavour, body, texture, colour, appearance and melting resistance, the *Kulfi* samples of different treatments were analysed. Attributes was rated on nine-point Hedonic scale (Nelson and Trout, 1964)

Microbiological Analysis

Microbial count method probiotic Kulfi was determined as per the procedure given in “Manual in Dairy Bacteriology.” ICAR, (1972).

- Total viable count (SPC)
- Coli form test
- Yeast & Moulds

Flow chart for manufacturing Herbal Kulfi



Source- Sukumar (1980)

4. RESULTS AND DISCUSSIONS

A detailed Chemical analysis (fat, total solids, acidity, protein, moisture, ash pH, carbohydrate) was conducted for estimation of the nutritional contents of *kulfi* samples. The trained panellist evaluated the Organoleptic characteristics such as flavour and taste, body and texture, colour and appearance, melting resistance and overall acceptability using 9-point hedonic scale.

Parameter	Increasing order of scores /values based on mean values of different parameters of treatment			
1. Chemical analysis (in percentage)				
Fat	T ₀ (10.14)	T ₁ (10.12)	T ₂ (10.06)	T ₃ (10.00)
Total solids	T ₀ (37.36)	T ₁ (37.24)	T ₂ (37.24)	T ₃ (37.16)
Acidity	T ₃ (0.24)	T ₂ (0.23)	T ₁ (0.23)	T ₀ (0.22)
Protein	T ₃ (3.76)	T ₂ (3.72)	T ₁ (3.64)	T ₀ (3.58)
Moisture	T ₃ (62.84)	T ₂ (62.76)	T ₁ (62.76)	T ₀ (62.64)
pH	T ₃ (6.25)	T ₂ (6.21)	T ₀ (6.15)	T ₁ (6.14)
Ash	T ₃ (0.71)	T ₂ (0.67)	T ₁ (0.60)	T ₀ (0.53)
2. Physical analysis				
Melting resistant (In minutes)	T ₁ (6.09)	T ₂ (6.06)	T ₃ (6.6)	T ₀ (5.12)
3. Organoleptic scores (9-point hedonic scale)				
Colour & Appearance	T ₂ (8.50)	T ₃ (8.50)	T ₁ (8.26)	T ₀ (8.14)
Body & Texture	T ₂ (8.60)	T ₁ (8.00)	T ₀ (8.12)	T ₃ (7.82)
Flavour & taste	T ₂ (8.58)	T ₀ (8.38)	T ₁ (8.36)	T ₃ (8.27)
Melting resistance	T ₂ (8.58)	T ₀ (8.30),	T ₃ (8.14)	T ₁ (8.00)
4. Microbiological analysis				
SPC (cfu/g)	T ₂ (8.50)	T ₃ (8.50)	T ₁ (8.26)	T ₀ (8.14)
Coliform (cfu ² /g)	G-Ve	G-Ve	G-Ve	G-Ve
Yeast & Moulds (per g)	T ₀ (20.66)	T ₃ (15.33)	T ₁ (13.33)	T ₂ (11.33)
5. Cost				
kulfi (in rupees/kg)	T ₃ (54.68)	T ₂ (52.68)	T ₁ (50.68)	T ₀ (46.68)

Physico-Chemical Analysis: highest fat percentage in kulfi was T₀ (10.14) followed by T₁ (10.12), T₂ (10.06) and T₃ (10.00). Statistical analysis random block design was finding no significant at 5% level. Highest total solid percentage in kulfi was T₀ (T₀ (37.36)) followed by T₁ (37.24), T₂ (37.24) and T₃ (37.16). Statistical analysis random block design was finding no significant at 5% level. Highest acidity percentage in kulfi was T₃ (0.24) followed by T₂ (0.23), T₁ (0.23) and T₀ (0.22). Statistical analysis random block design was finding significant at 5% level. Highest protein percentage in kulfi was T₃ (3.76) followed by T₂ (3.72), T₁ (3.64) and T₀ (3.58). Statistical analysis random block design was finding significant at 5% level. Highest moisture percentage in kulfi was T₃ (62.84) followed by T₂ (62.76), T₁ (62.76) and T₀ (62.64). Statistical analysis random block design was finding significant at 5% level. Highest pH in kulfi was T₃ (6.25) followed by T₂ (6.21), T₀ (6.15) and T₁ (6.14). Statistical analysis random block

design was finding significant at 5% level. Highest ash percentage in kulfi was T₃ (0.71) followed by T₂ (0.67), T₁ (0.60) and T₀ (0.53). Statistical analysis random block design was finding significant at 5% level.

Physical analysis: Highest melting (minutes / ml) resistant in kulfi was T₁ (6.09) followed by T₂ (6.06), T₃ (6.6) and T₀ (5.12). Statistical analysis random block design was finding significant at 5% level.

Organoleptic scores : Highest Colour & Appearance resistant in kulfi was T₂ (8.50) followed by T₁ (8.50), T₃ (8.26) and T₀ (8.14). Statistical analysis random block design was finding significant at 5% level. Highest Body & Texture resistant in kulfi was T₂ (8.60) followed by T₁ (8.00), T₃ (8.12) and T₀ (7.82). Statistical analysis random block design was finding significant at 5% level. Highest Flavour & taste resistant in kulfi was T₂ (8.58) followed by T₁ (8.36), T₃ (8.27) and T₀ (8.38). Statistical analysis random block design was finding significant at 5% level.

Highest Flavour & taste resistant in kulfi was T₂ (8.58) followed by T₁ (8.00), T₃ (8.14) and T₀ (8.30). Statistical analysis random block design was finding significant at 5% level.

Organoleptic scores : standard plate count in kulfi was T₂ (8.50) T₁ (8.50), T₃ (8.50) followed by T₀ (8.14). Statistical analysis random block design was finding significant at 5% level. Highest yeast and mould count in kulfi was T₂ (11.33) followed by T₁ (13.33), T₃ (15.33) and T₀ (20.66). Statistical analysis random block design was finding significant at 5% level. Coliform count was found nil.

Cost analysis: Highest yeast and mould count in kulfi was T₃ (54.68) followed by T₁ (50.68), and T₂ (52.68), T₀ (46.68). Statistical analysis random block design was finding significant at 5% level.

To determine the effect of scoop water hygiene on the microbiological quality of *Kulfi* an investigation of unopened Kulfi, Kulfi in use, and Kulfi-scoop water (n=91) was done. The modal value of an aerobic plate count for scoop waters was found around 10(6) c.f.u. ml⁻¹, whereas unopened icecreams generally had counts around 10(3)-10(4) c.f.u. ml⁻¹ and when in use, it increases by one order of magnitude. Many scoop waters had low coli form counts, but almost half contained >100 c.f.u. ml⁻¹. *E. coli* was isolated in 18% of ice creams in use, and in 10% of unopened ice creams. *S. aureus* was not detected in any sample. Wilson (1997) reported "Fresh basil contains 80.9% moisture, 2.3% protein, 0.9% fat, 1.2% minerals, 2.4% fiber and 12.3% carbohydrates." "The minerals present in basil are iron, calcium and phosphorous. It also contains vitamins such as thiamine, riboflavin, niacin and vitamin C" (Govindarajan *et al.*, 1982).

5. CONCLUSION:

The results of the current experiment indicate that samples created in a lab were superior in every way, both in terms of sensory and chemical characteristics. You may

make a high-quality kulfi by using high-quality buffalo milk, adding sugar, a stabilizer in the right proportion, and herbal basil essence. Sensory examination revealed that T2, a sample made with 3% basil leaf extract, was the best.

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