

**RESEARCH ARTICLE :**

## Preparation of *Kulfi* with ginger extract

**■ D.R. RAULWAD, N.S. KAMBLE AND G.K. LONDHE****ARTICLE CHRONICLE :****Received :**

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**SUMMARY :** An investigation was conducted in the year 2013-14 research work had been conducted on utilization of ginger extract in *Kulfi*. Thus, looking to the health benefits and pleasant aroma of ginger extract, it was proposed to study on preparation of ginger *Kulfi*, by using buffalo milk. In the present study an attempt has been made to study the chemical and sensory evaluation of *Kulfi* at different treatment combinations. The ( $T_0$ ) control *Kulfi* and *Kulfi* with different levels of ginger extract 2, 4 and 6 per cent ( $T_1$ ,  $T_2$  and  $T_3$ ) was prepared by adopting standard procedure. It was observed that moisture content decreased significantly as the level of ginger extract increased from 2 to 6 part, there was significant decrease in fat content of *Kulfi* with ginger extract as compared to control, protein content decreased significantly as the per cent level of added ginger extract increased, total solid content increased significantly as the per cent addition of ginger extract in *Kulfi* increased, there was Significant increase in acidity treated samples as compared to control.

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### BACKGROUND AND OBJECTIVES

Ginger has a several medicinal properties. Ginger protect against colorectal cancer as well as ovarian cancer. According to the Ayurvedic medical system, ginger is carminative, stimulant and gives stimulating remedies. Ginger is a diaphoretic, spasmolytic and intestinal stimulant. Fresh ginger has been used for cold induced diseases, asthma, nausea, cough, heart palpitation, swelling and rheumatism. Ginger tea is a beverage in many countries, the tea is made by boiling peeled and sliced ginger to which brown sugar is often added. Drinking ginger tea with meal will greatly aid digestion and assimilation. Ginger extracts also have antibacterial, antispasmodic,

antiulcer, anti-allergenic and antioxidant qualities as well. Ginger is a popular home remedy in India today (Anonymous, 2010).

Earlier studies conducted on incorporation of ginger juice in *Burfi* indicated that ginger juice improves medicinal value and overall acceptability of finished product to considerable extent. (Kumbhar, 2011).

So far scanty research work had been conducted on utilization of ginger extract in *Kulfi*. Thus, looking to the health benefits and pleasant aroma of ginger extract, it is proposed to study on preparation of *ginger Kulfi*, by using buffalo milk with following objectives:

– To standardize the process for preparation of *Kulfi* with ginger extract

**Author for correspondence :****N.S. KAMBLE**

Department of Animal  
Husbandry and Dairy  
Science, Vasantnao Naik  
Marathwada Krishi  
Vidyapeeth, PARBHANI  
(M.S.) INDIA  
Email: Narendra\_5258@  
rediffmail.com

See end of the article for  
authors' affiliations

– To study the physico-chemical composition of finished product.

## RESOURCES AND METHODS

The study was conducted at Department of Animal husbandry and Dairy science at College of Agriculture, Latur, Vasant Rao Naik Marathawada Krishi Vidyapeeth, Parbhani during 2013 – 2014 Buffalo milk required for the study was procured from the local market, Latur. Fresh and standardized milk with 6 per cent fat was used for product preparation. Good quality fresh wetted ginger was procured from the local market. It was grinded in paste form, and then extract was strained through fine sieve. Sodium alginate was used @ 0.15 per cent as stabilizer for preparation of *Kulfi*. *Kulfi* cones filled with *Kulfi* mix were kept in deep freezer at temperature -20 °C for 4 to 6 hrs for hardening of *Kulfi* mix. Moisture content of *Kulfi* samples were determined by procedure described by ISI: 2802 (1964). Fat content of *Kulfi* samples was determined by Gerber's Method as in IS: 1224 (part II) (1977). The protein content of *Kulfi* was determined by estimating the nitrogen content by method described in A.O.A.C. (1965). The total solid content of *Kulfi* was determined according to method given by ISI: 2802 (1964). Ash content of *Kulfi* was determined as per procedure given in IS: 1479 (Part-II) 1961. Sucrose was determined according to method described in ISI handbook of food analysis part XI (1981). The titrable acidity content of *Kulfi* was determined by method described IS1479 (1960) part-I.

## OBSERVATIONS AND ANALYSIS

In the present investigation entitled, "Preparation of *Kulfi* with ginger extract", an attempt was made to study the chemical evaluation of *Kulfi* at different treatment combinations. The treatments details were.

T<sub>0</sub> - 100 parts of buffalo milk

T<sub>1</sub> - 2 parts of ginger extract + 98 parts of buffalo milk

T<sub>2</sub> - 4 parts of ginger extract + 96 parts of buffalo milk

T<sub>3</sub> - 6 parts of ginger extract + 94 parts of buffalo milk

### Preparation of *Kulfi* with ginger extract:

The (T<sub>0</sub>) control *Kulfi* and *Kulfi* with different levels of ginger extract 2, 4 and 6 per cent (T<sub>1</sub>, T<sub>2</sub> and T<sub>3</sub>) was prepared by adopting standard procedure described as below:

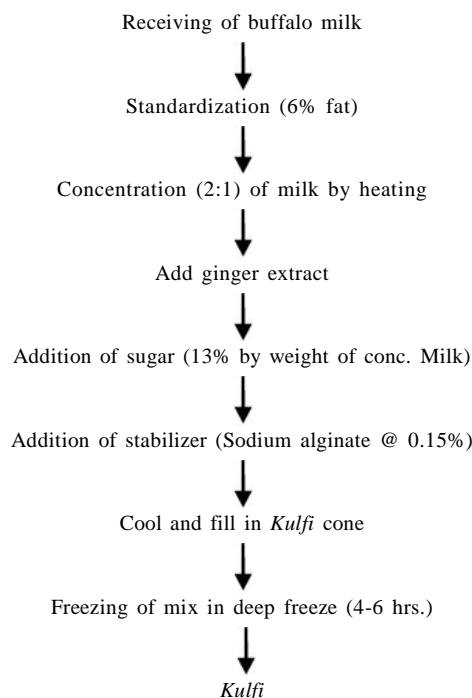


Fig. 1: Flow diagram for preparation of *Kulfi* with ginger extract

**The chemical composition of milk and ginger extract used for preparation of ginger *Kulfi* is given in Table 1 :**

From the Table 1, it was observed that total solid content in buffalo milk was less as compared to ginger extract.

### Moisture content in *Kulfi*:

From Table 2 it was observed that moisture content of control *Kulfi* T<sub>0</sub> (59.35%) was significantly higher than *Kulfi* with ginger extract and moisture content was

**Table 1 : Average chemical composition of standardized buffalo milk and ginger extract used for preparation of ginger *Kulfi***

Sr. No.	Type of milk	Moisture (%)	Protein (%)	Fat (%)	Total sugar (%)	Acidity (%)	PH (%)	Total solid (%)	Ash (%)
1.	Buffalo milk	84.06	3.88	6.02	5.24	0.180	6.71	15.94	0.80
2.	Ginger extract	75.08	4.88	5.03	13.27	0.432	6.40	24.92	1.74

decreased significantly as the level of ginger extract increased from 2 to 6 parts.

#### Fat content in *Kulfi* :

The results showed that fat content of control *Kulfi* was significantly higher than *Kulfi* with Ginger extract. Significant decrease in fat content of *Kulfi* with ginger extract as compared to control could be due to less fat content in ginger extract than buffalo milk (Table 3).

In agreement with present investigation, the range values for per cent in *Kulfi* prepared by Kale (2011) in the kesar mango pulp *Kulfi* and reported fat 10.11 to 11.80 per cent, Sonawane (2011) in case of the bottle gourd pulp *Kulfi* and reported fat 10.98 to 12.11 per cent, and Wagh (2011) studied the custard apple pulp *Kulfi* and reported fat 10.5 to 12.03 per cent. These values were found in the range of our findings with slight variation, which might be due to the different ingredients

used by them.

#### Protein content in *Kulfi*:

From the Table 4 the results showed that protein content of control *Kulfi* was significantly higher than *Kulfi* sample with 2, 4 and 6 parts ginger extract. Among the treated samples protein content decreased significantly as the per cent level of added ginger extract increased from 2 to 6. In agreement with present investigation, the range values for per cent in *Kulfi* prepared by Kale (2011) in the kesar mango pulp *Kulfi* and reported protein 4.21 to 4.48 per cent, Sonawane (2011) in case of the bottle gourd pulp *Kulfi* and reported protein 3.23 to 3.39 per cent, and Wagh (2011) studied the custard apple pulp *Kulfi* and reported protein 3.13 to 3.51 per cent. These values were found in the range of our findings with slight variation, which might be due to the different

**Table 2 : Moisture content of *Kulfi* (%) with ginger extract**

Treatments	Replications						Mean
	I	II	III	IV	V	VI	
T <sub>0</sub>	59.30	59.36	59.38	59.30	59.37	59.36	59.35 <sup>a</sup>
T <sub>1</sub>	59.12	59.18	59.20	59.12	59.19	59.18	59.17 <sup>b</sup>
T <sub>2</sub>	59.00	59.06	59.08	59.00	59.07	59.06	59.05 <sup>c</sup>
T <sub>3</sub>	58.90	58.96	58.98	58.90	58.97	58.96	58.95 <sup>d</sup>
S.E. ± 0.015						C.D. at 5% = 0.044	

Values with different superscripts are significantly different at P < 0.05

**Table 3 : Fat content of *Kulfi* (%) with ginger extract**

Treatments	Replications						Mean
	I	II	III	IV	V	VI	
T <sub>0</sub>	11.80	11.78	11.72	11.75	11.82	11.73	11.77 <sup>a</sup>
T <sub>1</sub>	11.35	11.33	11.27	11.30	11.42	11.33	11.33 <sup>b</sup>
T <sub>2</sub>	10.85	10.83	10.77	10.80	10.92	10.83	10.83 <sup>c</sup>
T <sub>3</sub>	10.30	10.28	10.22	10.25	10.37	10.28	10.28 <sup>d</sup>
S.E. ± 0.020						C.D. at 5% = 0.060	

Values with different superscripts are significantly different at P < 0.05

**Table 4 : Protein content of *Kulfi* (%) with ginger extract**

Treatments	Replications						Mean
	I	II	III	IV	V	VI	
T <sub>0</sub>	8.98	9.00	8.97	8.96	8.94	8.95	8.97 <sup>a</sup>
T <sub>1</sub>	8.63	8.65	8.62	8.61	8.59	8.60	8.62 <sup>b</sup>
T <sub>2</sub>	8.30	8.32	8.29	8.28	8.26	8.27	8.29 <sup>c</sup>
T <sub>3</sub>	8.02	8.04	8.01	8.00	7.98	7.99	8.01 <sup>d</sup>
S.E. ± 0.009						C.D. at 5% = 0.027	

Values with different superscripts are significantly different at P < 0.05

ingredients used by them.

### Total solid content in *Kulfi*:

Significant increase in total solid content was observed in treated samples as compared to control. Among the treated samples per cent total solid content increased significantly as the per cent addition of ginger extract in *Kulfi* increased from 2 to 6. Increase in total solid content of *Kulfi* with ginger extract may be due to high total solid content and low moisture content in ginger extract. In agreement with the present study, the range values for per cent in *Kulfi* prepared by Kale (2011) studied the kesar mango pulp *Kulfi* and reported total solid 33.01 to 35.80 per cent, Sonwane (2011) in case of the bottle gourd pulp *Kulfi* and reported total solid 32.84 to 35.48 per cent, and Wagh (2011) studied the custard apple pulp *Kulfi* and reported total solid 34.41 to 35.8 per cent. These values were found in the range of our

findings with slight variation, which might be due to the different ingredients used by them (Table 5).

### Ash content in *Kulfi*:

The results showed that ash content of control sample was lower than the *Kulfi* with ginger extract. In agreement with present investigation, Dodake (2013) observed in the ash gourd pulp *Kulfi* and reported ash 0.73 to 0.94 per cent, Gavhane (2013) studied the ginger *Peda* and reported ash 2.60 to 3.30 per cent, respectively. These values were found in the range of our findings with slight variation, which might be due to the different ingredients used by them (Table 6).

### Total sugar content in *Kulfi*:

From the Table 7 there was significant increase in total sugar content was observed in treated samples as compared to control. Among the treated samples per cent

**Table 5: Total solid content of *Kulfi* (%) with ginger extract**

Treatments	Replications						Mean
	I	II	III	IV	V	VI	
T <sub>0</sub>	40.70	40.64	40.62	40.70	40.63	40.64	40.66 <sup>a</sup>
T <sub>1</sub>	40.88	40.82	40.80	40.88	40.85	40.82	40.84 <sup>b</sup>
T <sub>2</sub>	41.00	40.94	40.92	41.00	40.93	40.94	40.96 <sup>c</sup>
T <sub>3</sub>	41.10	41.04	41.02	41.10	41.03	41.04	41.06 <sup>d</sup>
S.E. ± 0.015						C.D. at 5% = 0.044	

Values with different superscripts are significantly different at P < 0.05

**Table 6 : Ash content of *Kulfi* (%) with ginger extract**

Treatments	Replications						Mean
	I	II	III	IV	V	VI	
T <sub>0</sub>	1.40	1.38	1.42	1.44	1.37	1.43	1.41 <sup>d</sup>
T <sub>1</sub>	1.52	1.50	1.54	1.56	1.59	1.55	1.54 <sup>c</sup>
T <sub>2</sub>	1.66	1.64	1.68	1.70	1.73	1.69	1.68 <sup>b</sup>
T <sub>3</sub>	1.80	1.78	1.82	1.84	1.87	1.83	1.82 <sup>a</sup>
S.E. ± 0.013						C.D. at 5% = 0.038	

Values with different superscripts are significantly different at P < 0.05

**Table 7 : Total sugar content of *Kulfi* (%) with ginger extract**

Treatments	Replications						Mean
	I	II	III	IV	V	VI	
T <sub>0</sub>	18.52	18.48	18.51	18.55	18.50	18.53	18.52 <sup>a</sup>
T <sub>1</sub>	19.38	19.34	19.37	19.41	19.36	19.39	19.38 <sup>b</sup>
T <sub>2</sub>	20.19	20.15	20.18	20.22	20.17	20.20	20.19 <sup>c</sup>
T <sub>3</sub>	20.98	20.94	20.97	21.01	20.96	20.99	20.98 <sup>d</sup>
S.E. ± 0.010						C.D. at 5% = 0.030	

Values with different superscripts are significantly different at P < 0.05

total sugar content increased significantly as the per cent addition of ginger extract in *Kulfi* increased from 2 to 6. In agreement with present investigation, Gavhane (2013) studied the ginger *Peda* and reported total sugar 46.05 to 48.58 per cent, respectively. These values were found in the range of our findings with slight variation, which might be due to the different ingredients used by them.

### Conclusion:

It was concluded from the results that ginger extract tried in this study could be successfully incorporated in *Kulfi* mix to improve sensory attributes of the product at 2 parts level. Though the fat, protein and overall acceptability of *Kulfi* with ginger extract decreased significantly as compared to control. Further, increasing level of ginger extract in *Kulfi* from 4 to 6 per cent resulted in decreasing sensory score significantly.

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Authors' affiliations :

**D.R. RAULWAD AND G.K. LONDHE**, Department of Animal Husbandry and Dairy Science, Vasanttrao Naik Marathawada Krishi Vidyapeeth, PARBHANI (M.S.) INDIA

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