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### Cow milk lassi prepared by incorporation of ginger (*Zingiber officinale* L.) juice

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**Abstract**

The present investigation was undertaken to the preparation of cow milk lassi with utilize Ginger (*Zingiber officinale* L.) Juice. Milk was standardized to 4 per cent fat and lassi was prepared with different levels of ginger juice *Viz.* 100:0 (T<sub>1</sub>), 99:1.0 (T<sub>2</sub>), 98:2.0 (T<sub>3</sub>), 97:4.0 (T<sub>4</sub>) and 96:4.0 (T<sub>5</sub>) lassi to ginger juice were laid out with five treatments and four replications in Completely Randomized Design (CRD). The data revealed that fat, protein, moisture, ash, acidity per cent and pH value were slightly increased with increase in the levels of ginger juice. The good quality lassi prepared with addition of 2.0 per cent of ginger juice contained 3.88, 18.26, 0.65, 3.63, 81.74, per cent and fat, total solid, acidity, protein, moisture, respectively. The sensory evaluation carried out by the judges, showed that the lassi prepared by blending with 2 per cent ginger juice (T<sub>3</sub>) had highest score for flavour (40.90 out of 45), body and texture (28.87 out of 30), colour and appearance (23.89 out of 25), acidity and the overall acceptability had the highest score (8.63 out of 9) by 9 point hedonic scale and ranked as the most acceptable treatment. The cost of production of the lassi prepared with 2 per cent of ginger juice in (T<sub>3</sub>) was Rs. 37.55 per kg which was superiorly accepted by the panel of judges. Hence, it is concluded that the best quality lassi can be prepared by using 2 per cent of ginger juice and 98 per cent of lassi with 8% sugar.

**Keywords:** lassi, ginger juice, sensory attributes, cost structure

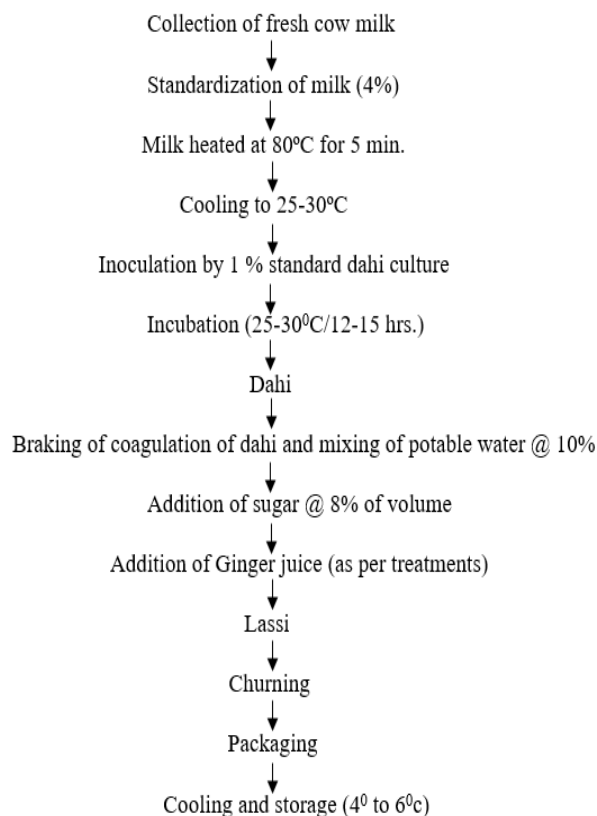
**Introduction**

Fermented milk is used for human consumption as refreshing beverages and nutritious food in many parts of the world since the earliest ages. About 9 per cent of total milk produced in India is converted into fermented milk product and this sector is showing an annual growth rate of more than 20 per cent per annum (Singh 2006)<sup>[9]</sup>.

Ginger (*Zingiber officinale* L.), being a major spice, it has many uses in food as a flavoring and medicinal product. The aroma of ginger is pleasant with penetrants flavor, slightly biting due to antiseptic or pungent compounds present in it, which make it indispensable in the manufacture of number of products. It is common ingredient in Asian cooking. Ginger has a several medicinal properties. According to the ayurvedic medical system, it is carminative, stimulant and gives stimulating remedies. It is diaphoretic, spasmolytic and intestinal stimulant. Fresh ginger has been used for cold induced diseases, asthma, nausea, cough, heart palpitation, swelling and rheumatism. Ginger extracts also have antibacterial, antispasmodic, antiulcer, antiallergenic and antioxidant qualities as well.

**Materials and methods**

The utilization of Ginger (*Zingiber officinale* L.) Juice. In preparation of cow milk lassi was undertaken in the section of Animal Husbandry and Dairy science, College of Agriculture Nagpur. The lassi prepared in the proportion of 100:0 (T<sub>1</sub>), 99:1.0 (T<sub>2</sub>), 98:2.0 (T<sub>3</sub>), 97:3.0 (T<sub>4</sub>) and 96:4.0 (T<sub>5</sub>) lassi to Ginger juice and sugar was added @ 8% in all treatments. The flow chart for preparation of Ginger juice lassi is given as below.



**Fig 1:** Flow chart for preparation of Ginger juice lassi

The product was subjected to chemical analysis the fat (by Gerber's method, SP: 18 part XI (1981) [3], total solids (by gravimetric, SP: 18 part XI (1981) [3], acidity (IS:1479, Part I (1961) [2], protein (by macro-kjeldahl method, IS: 1479 Part II (1961) [2], ash (SP: 18 part XI (1981) [3], pH (by digital pH meter) and moisture was determined by subtracting the total solid content from 100 in the sample.

The quality ginger juice lassi was judged by sensory evaluation by offering the sample to the panel of 5 judges by score card method suggested by Pal and Gupta (1985) [7] and

overall acceptability by 9 point hedonic scale (Nelson & Trout, 1964).

The experiment was laid out in completely randomized design (CRD) with 5 treatments and 4 replications. The data obtained were analyzed statistically according to method described by Snedecor and Cochran (1994) [10].

## Results and discussion

### A) Physico-chemical composition of ginger juice lassi

The finished product of ginger juice lassi were subjected for the proximate analysis viz., fat, total solids, acidity, protein, and moisture. The results obtained on account of these parameter are presented in Table 1 revealed that the effect of different levels of ginger juice on physico-chemical attributes were found to be non-significant. The similar results were reported by Swati (2011) [11] in papaya pulp lassi, Laxminarayan and Shankar (1980) [5] in plane lassi, Jangale (2011) [4] in custard apple pulp lassi and Aparna. (2007) [1] in pineapple fruit pulp lassi.

**Table 1:** The chemical composition of lassi prepared with different levels of ginger juice (per cent) as affected by different treatments

Treatment	Fat	Total solid	Acidity	Protein	Moisture
T <sub>1</sub>	4.03	18.40	0.71	3.70	81.60
T <sub>2</sub>	3.91	18.33	0.68	3.66	81.67
T <sub>3</sub>	3.88	18.26	0.65	3.63	81.74
T <sub>4</sub>	3.85	18.21	0.63	3.60	81.79
T <sub>5</sub>	3.81	18.18	0.60	3.57	81.82
S.E.(m)±	0.011	0.021	0.012	0.008	0.021
Result	NS	NS	NS	NS	NS

### B) Sensory evaluation of ginger juice lassi

The data with respect to sensory evaluation of ginger juice lassi are presented in Table 2 and showed that lassi prepared by using 2 per cent ginger juice (T<sub>3</sub>) scored highest rank for flavour (40.90 out of 45), body and texture (28.87 out of 30), colour and appearance (23.89 out of 30), and overall acceptability score (8.63 out of 9). Similar were reported by Rajenimbalkar (2011) [8] in lassi prepared with different levels ginger juice lassi, Pal and Gupta (1985) [7] in lassi prepared with mango pulp and Nair *et al.* (2007) [6] in acidified lassi.

**Table 2:** The data with respect to sensory evaluation of ginger juice lassi are presented

Treatment	Flavour (45)	Body & texture (30)	Colour & appearance (25)	overall acceptability (by hedonic scale)
T <sub>1</sub>	38.35	26.45	22.32	6.50
T <sub>2</sub>	39.31	27.16	22.70	7.53
T <sub>3</sub>	40.90	28.87	23.89	8.63
T <sub>4</sub>	39.59	27.63	22.16	7.81
T <sub>5</sub>	39.14	27.25	21.71	7.78
S.E. (m) ±	0.039	0.058	0.028	0.149
C. D.	0.119	0.017	0.089	0.449
Results	Sig.	Sig.	Sig.	Sig.

### C) Cost of production of ginger juice lassi

Lassi prepared with addition of Ginger juice at 0 (T<sub>1</sub>), 1.0 (T<sub>2</sub>), 2.0 (T<sub>3</sub>), 3.0 (T<sub>4</sub>) and 4.0 per cent (T<sub>5</sub>) were Rs. 36.55, Rs. 37.05, Rs. 37.55, Rs. 38.05 and Rs. 38.55, respectively. The cost of production of lassi prepared with 2.0 per cent ginger juice (T<sub>3</sub>) was found to be Rs. 37.55 per kg which is best treatment selected by judges by sensory evaluation.

### Conclusion

Hence, it is concluded that the best quality lassi can be prepared by using 2 per cent of ginger juice and 98 per cent of lassi with 8% sugar.

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