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Development and quality assessment of herbal Kulfi prepared with different levels of aloe vera juice

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Abstract
In the millennium we are witnessing the upward trend in nutritional and health awareness which has increased the consumer demand for functional foods. The present investigation was made with an attempt to develop herbal Kulfi prepared with different level of Aloevera juice by partial addition of different level of Aloevera juice, and on national quality. For control, Kulfi mix was standardized to12% milkfat,14%sugar &0.2 % stabilizer, to obtain 44%total solid and treatment (T_1) was standardized 12%fat 9:05 sugar and Aloevera juice and 0.2% stabilizer, (T_2) was standraduzed to 12% fat, 90:10 sugar and Aloe vera juice and 0.2% stabilizer &(T_3) was standardized to 12%fat,85:15 sugar Aloevera juice and 0.2% stabilizer. In the Kulfi samples of different treatment and control, the chemical analysis (fat, total solids, acidity, protein moisture, ash pH, carbohydrate, antioxidant) was done for estimating its nutritional contents. And also, the organoleptic characteristics like (flavor and taste, body and texture, colour and appearance, melting resistance and overall acceptability) was evaluated by trained panelist using 9-point hedonic scale. The highest value was observed in treatment (T_2) containg sugar and Aloevera juice (90:10). In microbiological analysis the best treatment (T_2) was selected SPC and coli form test.

Keywords: aloe vera juice kulfi, physicochemical properties, organoleptic evaluation

Introduction
In India about 0.7%of the total milk produced is converted into frozen dessert like ice-cream and kulfi is a traditional frozen dairy product of India, prepared by concentrating milk. it is then filled into aluminum or plastics cones and frozen in an earthen pot having a mixture of ice and salt. Kulfis are mainly popular due to their easy affordability and wide availability in various flavors. (Deshmukh *et al*, 2006) [1] Kulfi is a frozen dairy product made by suitable blending and processing of SMP and other milk products, together with sugar and flavor, with sugar and flavour, with or without stabilizer or colour A typical comopostion range for the components used in kulfi mix is milk fat 10-16%, milk solids not fat,9-12%, sucrose, corn syrup solids 4-6%, stabilizers/ emulsifiers 0-.05%, total solid 36-45% and water 55-64%. (Sharma and Hissaria, 2009) [5]. Standardized the method of production of kulfi and that use of milk with 26%TMS gives kulfi with beter body, texture and overall acceptability, kulfi contain 13-20% sugar which is an obstacles to relish for diabetic people**.** Salloja *et al*, (1982) [6].

FSSAI Standards of Kulfi
ICE CREAM, KULFI means the product obtained by frizzing a pasteurized mix prepared from milk and / or other products derived from milk with or without the addition of nutritive Sweeting agents, fruits and fruit product, eggs and egg products, coffee, cocoa chocolate condiments, spices, ginger and nuts and or coating. The said product may be frozen hard or frozen to soft consistency the said product shall have pleasant taste and smell from off flavor and rancidity. The type of ice -cream shall be indicated on the label otherwise standard for ice-cream shall apply.

Aloevera Juice

It contains over 70 biologically active compound and is claimed to have anti- inflammatory anti-oxidant, immune boosting, anticancer, healing anti-ageing and anti-diabetics properties. Aloes, by contrast, is an anthraquinone derivatives of the sap of the Aloe leaf which has been used for centuries as a purgative. (Langmead *et al*. 2004) [3] Aloevera leaf has been alienated in two major part namely the extranet green rind including the vascular bundles and the internal colorless parenchyma containg the aloe vera gel. Nearly 98.5% of water contained in present pulp of Aloe Vera. (Hamman 2008) [2]. Aloevera yogurt with lactic acid bacteria (single or mixed strains of Lactobacillus bulgaricus and streptococcus thermophilus) and compared it with yogurt prepared using dried skim milk and it was found that quality retention of aloe Vera yogurt at 5°C for 15 days was better than the milk yogurt**.** (Lee and Hand- Yoon (1997) [4].

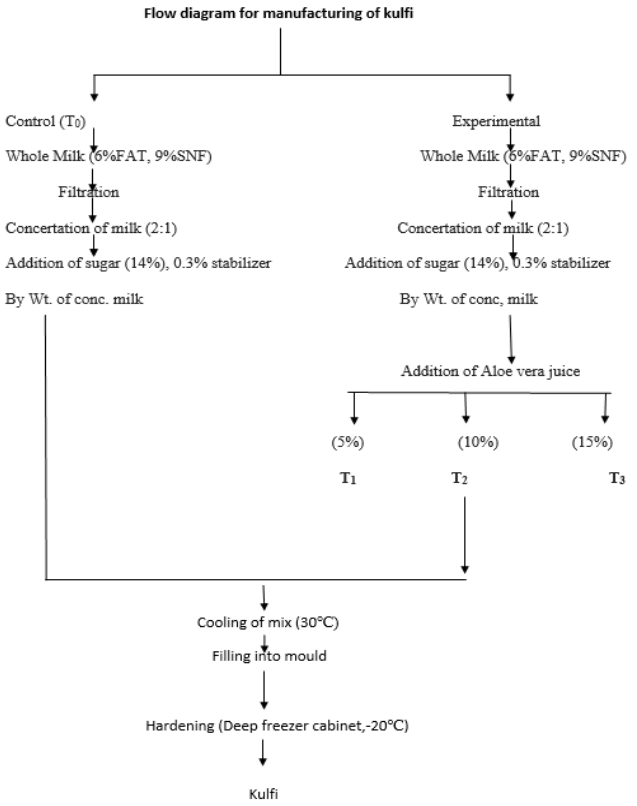
Materials and methods
Procurement and collection of ingredients
Milk: whole milk was purchased from local market of Allahabad.

Sugar: Sugar was purchased from local market of Allahabad.

Aloe Vera juice: Aloe Vera juice was purchased from local market of Allahabad**.**

Stabilizer: Sodium alginate was purchased from local market of Allahabad**.**

Treatment Combination
T_0 – Kulfi prepared without Aloevera juice (100:00)
T_1 – Kulfi prepared with Sugar Aloevera juice (95:05)
T_2 – Kulfi prepared with Sugar Aloevera juice (90:10))
T_3 – Kulfi prepared with Sugar Aloevera juice (85:15)



Result and Discussion

The analyzed data is presented in this chapter under the following headings:

1. Chemical characteristics
2. Microbial characteristics
3. Organoleptic characteristics
4. Statistical characteristics
5. Estimation of cost of production

Table 1: Average data for different parameters of control and experiments (in percent)

Parameters	Treatments			
	T_0	**T_1**	**T_2**	**T_3**
1. Chemical Analysis				
Carbohydrate %	13.12	10.13	9.39	8.65
Protein %	0.54	0.89	1.00	1.12
Fat %	0.12	0.21	0.23	0.26
Ash %	0.46	0.47	0.48	0.49
Total Solid %	14.24	11.71	11.12	10.53
Moisture %	85.76	88.28	88.87	89.47
TSS %	18.5	19.0	19.5	20.0
Acidity%	0.95	0.33	0.28	0.20
pH	3.8	4.2	4.6	5.0
Ascorbic Acid%	50.0	45	44	43.5
2. Microbiological analysis				
SPC × 10^{-3} (colony forming unit /gm)	6.80	13.40	14.60	15.00
Coliform count	Nil	Nil	Nil	Nil
3. Organoleptic Score (9- point hedonic scale)				
Color and Appearance	7.12	7.86	8.56	7.56
Consistance	8.01	8.10	8.38	8.08
Flavor and taste	7.48	8.02	8.12	7.90
Overall acceptability	7.70	8.38	8.48	8.28
4.Cost analysis				
Health Beverage (Rs./Litre	304	280.50	267	253.5

Summary and Conclusion

Physico- chemical analysis

Carbohydrate

The highest mean of Carbohydrate was recorded in the herbal kulfi prepared with different level of Aloevera juice sample of T_0(23.60) followed by T_1(22.41) T_2 (21.24) and T_3 (20.06).The difference in these values of carbohydrates percent T_0- T_1, T_0- T_2, T_0- T_3, T_1- T_2, T_1- T_3,&, T_2- T_3 were significant.

Fat

The highest mean of fat was recorded in the herbal kulfi prepared with different level of Aloevera juice sample of T_0(12.00) followed by T_1(11.40) T_2 (10.80) and T_3 (10.20).The difference in these values of fat percent T_0- T_1, T_0- T_2, T_0- T_3, T_1- T_2, T_1- T_3,&, T_2- T_3 were significant.

Protein

The highest mean of protein was recorded in the herbal kulfi prepared with different level of Aloevera juice sample of T_0(7.20) followed by T_1(6.77) T_2 (6.39) and T_3 (6.04).The difference in these values of carbohydrates percent T_0- T_1, T_0- T_2, T_0- T_3, T_1- T_2, T_1- T_3,&, T_2- T_3 were significant

Total Solids

The highest mean of total solid was recorded in the herbal kulfi prepared with different level of Aloevera juice sample of T_0(44.00) followed by T_1(41.90) T_2 (39.69) and T_3 (37.49)The difference in these values of total solid percent T_0- T_1, T_0- T_2, T_0- T_3, T_1- T_2, T_1- T_3,&, T_2- T_3 were significant

Moisture

The highest mean of moisture was recorded in the herbal kulfi prepared with different level of Aloevera juice sample of T_0(62.51) followed by T_1(60.31) T_2 (58.10) and T_3 (55.80)The difference in these values of moisture percent T_0- T_1, T_0- T_2, T_0- T_3, T_1- T_2, T_1- T_3,&, T_2- T_3 were significant

Ash

The highest mean of Ash was recorded in the herbal kulfi prepared with different level of Aloevera juice sample of T_0(1.40) followed by T_1(1.32) T_2 (1.26) and T_3 (1.20)The difference in these values of ash percent T_0- T_1, T_0- T_2, T_0- T_3, T_1- T_2, T_1- T_3,&, T_2- T_3 were non- significant

Acidity

The highest mean of acidity was recorded in the herbal kulfi prepared with different level of Aloevera juice sample of T_0(0.24) followed by T_1(0.23) T_2 (0.23) and T_3 (0.22)The difference in these values of acidity percent T_0- T_1, T_0- T_2, T_0- T_3, T_1- T_2, T_1- T_3,&, T_2- T_3 were significant

pH

The highest mean of pH was recorded in the herbal kulfi prepared with different level of Aloevera juice sample of T_0(6.32) followed by T_1(6.25) T_2 (6.21) and T_3 (6.15)The difference in these values of pH percent T_0- T_1, T_0- T_2, T_0- T_3, T_1- T_2, T_1- T_3,&, T_2- T_3 were significant.

Antioxidant

The highest mean of Antioxidant was recorded in the herbal

kulfi prepared with different level of Aloevera juice sample of T_3(40.17) followed by T_2(20.90) T_2 (10.71) and T_0 (00.00)The difference in these values of Antioxidant percent T_0- T_1, T_0- T_2, T_0- T_3, T_1- T_2, T_1- T_3,&, T_2- T_3 were significant

Organoleptic parameters

Color& Appearance

The highest mean of colour appearance was recorded in the herbal kulfi prepared with different level of Aloevera juice sample of T_2(8.58) followed by T_1(8.44) T_0 (8.22) and T_3 (8.14)The difference in these values of moisture percent T_0- T_1, T_0- T_2, T_0- T_3, T_1- T_2, T_1- T_3,&, T_2- T_3 were significant

Body & texture

The highest mean of body& texture was recorded in the herbal kulfi prepared with different level of Aloevera juice sample of T_2(8.60) followed by T_0(8.26) T_3 (7.90) and T_1 (7.88) The difference in these values of Body& texture percent T_0- T_1, T_0- T_2, T_0- T_3, T_1- T_2, T_1- T_3,&, T_2- T_3 were significant

Flavour &taste

The highest mean of consistency was recorded in the herbal kulfi prepared with different level of Aloevera juice sample of T_2(8.60) followed by T_0(8.26) T_3 (7.90) and T_1 (7.88) The difference in these values of moisture percent T_0- T_1, T_0- T_2, T_0- T_3, T_1- T_2, T_1- T_3,&, T_2- T_3 were significant

Melting resistance

The highest mean of melting resistance was recorded in the herbal kulfi prepared with different level of Aloevera juice sample of T_1(8.50) followed by T_2(8.02) T_3 (8.02) and T_0 (7.98) The difference in these values of melting resistance percent T_0- T_1, T_0- T_2, T_0- T_3, T_1- T_2, T_1- T_3,&, T_2- T_3 were significant.

Overall acceptability

The highest mean of overall acceptability was recorded in the herbal kulfi prepared with different level of Aloevera juice sample of T_2(8.52) followed by T_0(8.33) T_1 (8.20) and T_3 (8.15) The difference in these values of overall acceptability percent T_0- T_1, T_0- T_2, T_0- T_3, T_1- T_2, T_1- T_3,&, T_2- T_3 were significant

Microbiological parameters

SPC

The highest mean of SPC was recorded in the herbal kulfi prepared with different level of Aloevera juice sample of T_3(8.50) followed by T_1(3.00) T_0 (2.8) and T_2 (2.6) The difference in these values of SPC percent T_0- T_1, T_0- T_2, T_0- T_3, T_1- T_2, T_1- T_3,&, T_2- T_3 were significant

Coliform

The coli form count in control and control and experimental sample were found to be absent.

Conclusion

In view of the experiment results obtained during the present investigation. it may be concluded that the herbal Kulfi prepared with different level of Aloe vera juice can be successfully prepared by using whole milk, sugar and Aloe Vera juice. Kulfi made with Aloe vera juice of treatment T_2 were best in organoleptic characteristics and received highest score in organoleptic evaluation. T2 is best in microbial characteristics (minimum SPC), sample treatment T_1 were best (maximum melting melting resistance).

Reference

1. Deshmukh YD, Borkar PS, Rao RS, Khobragade CN. Biochemical evaluation of ice-cream sample j Dairy food Homes Sci. 2006; 25:76-78
2. Hamman JH. Composition and application of Aloe Vera leaf gel. Molecules. 2008; 13:1599-1616.
3. Langmead L, Makins RJ, Rampoton DS. Anti- inflame try effect of aloe vera gel in human colorectal mucosa in vitro, Aliment Pharmacol there. 2004; 19:521-527.
4. Lee, Hand-Yoon. Characteristics of Aloe Vera suspended liquid yogurt with lactobacillus case YIT 9018.Korend j animal sci. 1997; 39:93-100.
5. Sharma, Hissaria. Hydrocolloids-components ice cream, chemical weekly, 2009, 193-196.
6. Salooja M, Balachandran R. Studied on the production of kulfi. The Acceptable level of total milk solids j fd sci Technology. 1982; 19:116-118.