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Development of pistachio flavoured banana kulfi

Shiv Bhushan Singh and John David

Abstract

In the new 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 a pistachio flavoured banana kulfi by partial addition of different levels of banana pulp, and thereafter evaluate the effect of addition of pistachio and banana pulp on nutritional quality. For control (T₀), kulfi mix was standardized to 10% milk fat, 15% sugar, 2% pistachio powder & 0.2% stabilizers and treatment (T₁) was standardized to 10% fat, 15% sugar, 2% pistachio powder, 0.2% stabilizer and partial addition of banana pulp 5%, (T₂) was standardized to 10% fat, 15% sugar, 2% pistachio powder, 0.2% stabilizer and banana pulp 10% & (T₃) was standardized to 10% fat, 15% sugar, 2% pistachio powder, 0.2% stabilizer and partial addition of banana pulp 15%. In the kulfi samples of different treatments and control, the chemical analysis (total solids, fat, protein, carbohydrate and ash) was done for estimating its nutritional contents. And also the organoleptic characteristic like (flavour and taste, body and texture, colour and appearance, melting resistance and overall acceptability) was evaluated by trained panellist using 9 point hedonic scale. The highest value was observed in treatment (T₃) containing 15% level of Banana pulp.

Keywords: banana pulp, pistachio powder, buffalo milk, organoleptic evaluation, compositional analysis

Introduction

Kulfi is a frozen dairy product made by suitable blending and processing of SMP and other milk products, together with sugar and flavour, with or without stabilizer or colour. A typical compositional range for the components used in kulfi mix is milk fat 10-16%, milk solids not fat 9-12%, sucrose 9-12%, corn syrup solids 4-6%, stabilizers/ emulsifiers 0-0.5%, total solids 36-45%, and water 55-64%. Kulfi was prepared regularly for the grandest of all mughals to bring relief during the scorching summer. Kulfi also known as Malai kulfi/Malai-ka-burf is an indigenous frozen dairy product, which closely resembles ice cream in composition. Traditionally Kulfi is prepared by evaporating sweetened and flavoured milk by slow heating with almost continuous stirring to keep milk from sticking to the bottom of the vessel until its volume is reduced by a half thus concentrating the milk. It has a distinctive taste due to caramelization of lactose and sugar during the lengthy heating process. Ice cream is whipped with air or overrun, kulfi contains no air. It comes in various flavours, including strawberry, rose, mango, cardamom, saffron (kesar or saffron), and pistachio, the more traditional flavours, as well as supplemented with fruit pulp like apple, orange, strawberry, peanut, and avocado.

Banana is one of the fruits which contain high levels of B-vitamins, potassium and magnesium and low in salt. Rich in pectin, banana aid digestion and gently chelate toxins and heavy metals from the body. Banana is natural antacid and helps in production of white blood cells. Consumers are many and varied. Thus, in the dairy market of the future, some will demand low-priced products, while others will pay a premium for quality and uniqueness.

The pistachio (*pistacia vera*), a member of the cashew family, is a small tree originating from Central Asia and Middle East. The tree produces seeds that are widely consumed as food. Several mechanism for pistachios is that it has antihypertensive property. These mechanism includes pistachios high levels of the amino acid arginine (a precursor of the blood vessel dilating compound nitric oxide), high levels of phytosterols and monounsaturated fatty acid and improvement of endothelial cell functions through multiple mechanism including reductions in circulating levels of oxidized low density lepo-protien cholesterol and pro-Material and Methods.

The present investigation involves manufacturing of Banana pulp supplemented kulfi with different levels of Banana pulp and thereafter assess the sensory, physico chemical properties of developed Kulfi.

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Materials and Methods

Preparation of kulfi samples

Kulfi samples were prepared as per the method of Giri *et al.* 2012 with some modifications. For preparation of control kulfi samples milk was standardized to 6% fat and 9% SNF. It was taken in a double jacketed vat and condensed to half of the initial amount. Calculated quantity of the banana pulp was added to prepare kulfi samples of treatment T3, T2 and T1. For treatment T3, T2 and T1 banana pulp was added @ 15%, 10% and 5% of concentrated milk and 2% pistachio powder was added. Also 14% sugar was added after condensing. The mix was cooled to 5 °C and was frozen in moulds at -20 °C for overnight.

Physico chemical, organoleptic and sensory evaluation

Titrate acidity of kulfi was determined according to the method as described in IS: 1166-1973. pH was estimated by pH meter. Total solids was determined by gravimetrically as per the procedure for milk laid down in IS 2802, 1964. The fat percentage of kulfi was determined as per procedure laid down in IS: 1166-1973. Determination of protein was done as per the procedure suggested by Maneffee and Overman (1940). Determination of carbohydrate was done according to SP: 18, Part XI, 1981. Determination of ash content was done as per the procedure laid down in IS: 5962, 1970. Antioxidant properties was determined by DPPH method. Melting resistance was determined by (Giri *et al.* 2012). Kulfi was subjected to organoleptic evaluation to trained panelists who evaluated the product for colour & appearance, body & texture, flavor and taste, melting resistance and overall acceptability using 9 point hedonic scale as described by (Amerine *et al.* 1965) [2].

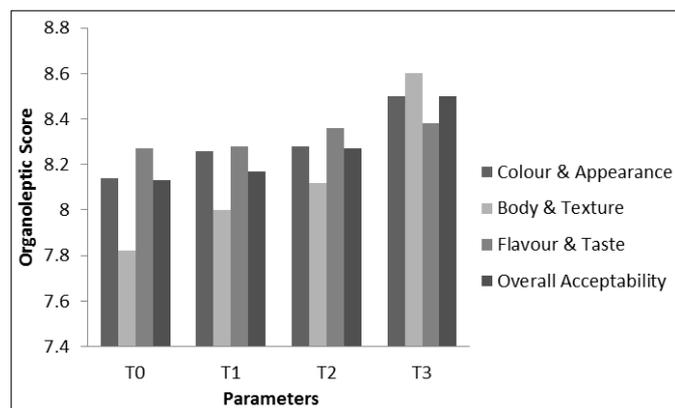
Statistical analysis

The data obtained were statistically analyzed for ANOVA using MS Excel software, 2007.

Results and Discussion

Effect of addition of banana pulp and pistachio powder on organoleptic score of Kulfi samples

The kulfi samples were subjected to organoleptic evaluation before a panel of trained judges using a 9 point hedonic scale. The samples were evaluated for colour & appearance, body & Texture, flavour and taste and overall acceptability. The organoleptic scores are presented graphically in Fig 1. From the figure, it can be observed that treatment T3 scored significantly higher values for colour & appearance, body & texture, flavour and taste and overall acceptability as compared to other treatments including control. Therefore kulfi samples of T3 treatment was taken as the optimized product.



Effect of addition of Banana pulp on physico chemical quality of Kulfi samples

The total solids (%), fat (%), protein (%), carbohydrate (%) and ash (%) of different types of Kulfi were compiled in Table 1. A significantly decreasing trend was observed in the fat and protein content of kulfi with increasing level of the pulp combination. The probable reason may be due to the lower protein and fat content of the pulp combination.

Table 1: Physico-Chemical evaluation of Kulfi (Mean)*.

Parameters	Types of Kulfi				S.Ed. ±	C. D. at 5%
	T ₀	T ₁	T ₂	T ₃		
Total Solids (%)	44.78	44.33	43.48	42.15	0.141	0.301
Fat (%)	11.70	11.50	10.81	10.45	0.028	0.025
Protein (%)	6.11	5.81	5.59	5.31	0.044	0.038
Carbohydrate (%)	26.27	26.30	26.34	26.39	0.069	0.218
Ash (%)	0.71	0.72	0.74	0.77	0.037	0.080

Conclusion

It may be concluded that the Pistachio Flavoured Banana Kulfi can be successfully prepared by supplementing Banana Pulp @15% and 2% pistachio powder of concentrated milk. Kulfi made with Banana Pulp in treatment T3 was best in organoleptic characteristics and received highest score in organoleptic evaluation (colour & appearance, body & texture, Flavour & taste, overall acceptability). Based on its value in traditional medicine and promise from preclinical studies, banana and pistachio have plethora of health benefits and kulfi being a widely accepted product, it can act as a vehicle to deliver the bioactive components of banana pulp and pistachio to the wide range.

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