

SENSORY EVALUATION OF PAPAYA MILK SHAKE

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ABSTRACT

The present Study was undertaken with an objective to prepare the standardized procedure of papaya milk shake with the sensory evaluation Milk shake was prepared from different proportions of cow milk and papaya pulp i.e. 95:05 (T₁), 90:10 (T₂), 85:15 (T₃) and 80:20 (T₄). The sensory score for overall acceptability of papaya milk shake blended with 5, 10, 15 and 20 per cent papaya pulp based on 9 point hedonic scale were 6.24, 7.00, 8.60 and 6.84, respectively. The score for flavor, body and texture, colour and appearance based on 100 point numeric scale were 39.68, 32.16 and 18.72, respectively. It was observed that the papaya milk shake prepared from 85 parts of cow milk and 15 parts of papaya pulp was most acceptable and ranked between like very much to like extremely.

KEYWORDS: Cow Milk, Milk Shake, Papaya Pulp, Sensory Evaluation

INTRODUCTION

Milk shake is a western dairy product obtained by freezing a mix very similar to soft serve ice cream mix and speedy mixing the frozen product in a mixer to make it pourable and generate foam in it (Sharma and Gupta, 1978). It has lower fat and sugar contents and higher milk solids not fat (MSNF) content than ice cream. Several types of milk shakes are sold in the market i.e mango milk shake, sapota milk shake, fig milk shake, banana milk shake, custard apple milk shake, etc.

Papaya (*Carica papaya* linn) fruit belongs to the species in genus *Carica* of the plant family Caricaceae, widely distributed throughout the tropics (Boghani *et al.*, 2012). Papaya is a good source of vitamins, particularly vitamin A and C, dietary fibre and minerals (calcium and iron) as well as provides flavour, aroma and texture to the pleasure of eating (Nakasone and Paull, 1998). Papaya is common man's fruit, which is reasonably priced and has a high nutritive value. It is well known for its exceptional nutritional and medicinal properties throughout the world. Nowadays, papaya is considered as a nutraceutical fruit due to its multifarious medicinal properties. The comparative low calories content (32 Kcal/100 gm of ripe fruit) make this a favourite fruit of obese people who are into weight reducing regime (Yogiraj *et al.*, 2014). Therefore, it was planned to study on utilization of papaya pulp in preparation of milkshake.

MATERIALS AND METHODS

During the entire study fresh, clean, whole cow milk was obtained from the section of Animal Husbandry and Dairy Science, College of Agriculture, Nagpur. The milk was strained through clean muslin cloth and transferred into well cleaned and sterilized flat bottom stainless steel vessel. Papaya pulp prepared from fresh and fully ripe papaya of local varieties available in the market was used for preparation of milk shake. Clean crystalline sugar purchased from local market was used as sweetening agent. Sodium alginate was used as a stabilizing agent. Papaya pulp was prepared with help of grinder.

Treatment Details

For preparation of papaya milk shake, following blends of papaya pulp and cow milk was prepared.

T₁ 5 % papaya pulp + 95 % cow milk by weight

T₂ 10 % papaya pulp + 90 % cow milk by weight

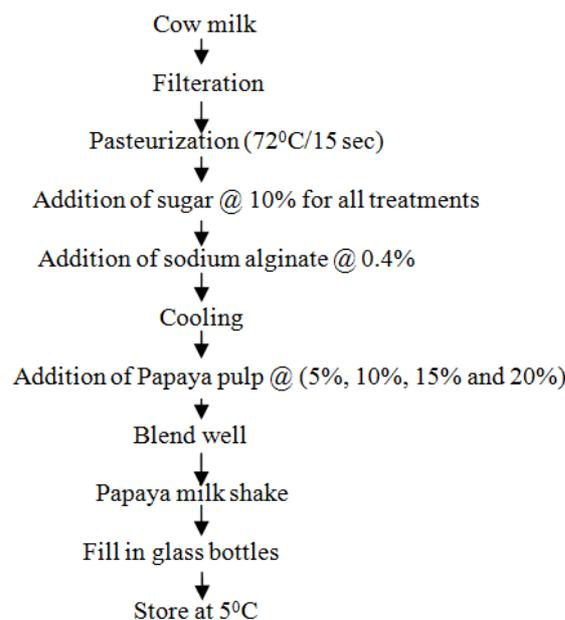
T₃ 15 % papaya pulp + 85 % cow milk by weight

T₄ 20 % papaya pulp + 80 % cow milk by weight

Preparation of Papaya Milk Shake

Method of preparation of Papaya milk shake was suggested and described by Kashid *et al.* (2007) with slight modification. Sugar was weighed as per proportion (10%) and sodium alginate (0.4%) for all the treatments. The milk was filtered and pasteurized to (72⁰C/15 sec) and at the same time sugar and sodium alginate were added. It was then allowed to cool. After cooling of this sweetened and stabilized milk papaya pulp was added as per the treatments. The mixture was thoroughly homogenized in juicer-grinder and thus blended milk shake was filled into glass bottles and kept for cooling.

Flow Diagram of Papaya Milk Shake



Sensory Evaluation and Cost of Structure

The sensory evaluation of papaya milk shake was carried out by the panel of 6 semi trained judges by adopting 100 point numeric score prescribed by pal and gupta (1985) as well as overall acceptability score was obtained by adopting 9 point hedonic scale referred by Nelson and Trout, 1964 point hedonic scale referred by Nelson and Trout, 1964. The cost of production of papaya milk shake was calculated by considering the running cost of material used and expenses on labor, electricity, LPG and Packaging etc. The prices were as per the prevailing market rates during study period. The combined effect of treatments was assessed by Complete Randomized Design (CRD) the method described by Panse and Sukhatme (1967).

RESULTS AND DISCUSSIONS

The results obtained from the present investigation are presented below:

Sensory Evaluation

Table 1: Sensory Evaluation and Overall Acceptability of Papaya Milk Shake

Treatment	Parameters (100 Point Numeric Score)			Overall Acceptability Score (9 Point Hedonic Scale)
	Flavour (45)	Body & Texture(35)	Colour & Appearance (20)	
T ₁	33.20	27.28	16.04	6.24
T ₂	33.48	28.24	17.16	7.00
T ₃	39.68	32.16	18.72	8.60
T ₄	34.20	26.32	15.36	6.84
S.E. (m) ±	0.957	0.658	0.351	0.181
C. D. at 5%	2.869	1.972	1.054	0.542

Values with different superscripts differ significantly (P<0.05)

Flavour

It is observed from table 1, the flavour of milk shake was significantly (P<0.05) affected due to addition of different levels of papaya pulp. In respect of flavor highest score (39.68) was obtained in milk shake prepared with 15 per cent papaya pulp, while the lowest score (33.20) was obtained in milk shake prepared with addition of 5 per cent papaya pulp (T₁). The results of the present investigation are comparable with the findings of Poul *et al.* (2009), they prepared custard apple milk shake and reported that as the percentage of custard apple pulp in the blend increase, the flavour score of the product also increased.

Body and Texture

The average scores for body and texture attributes of milk shake were 27.28, 28.24, 32.16 and 26.32 for treatments T₁, T₂, T₃ and T₄ respectively. The significantly highest score was (32.16) received by milk shake prepared with 15 per cent papaya pulp i.e treatment T₃ while the lowest score (26.32) was received by milk shake blended with addition of 20 per cent papaya pulp i.e treatment T₄. The results of the present investigation are in line with the findings of Pakalwad *et al.* (2010), they prepared papaya milk shake and reported that the score for body and texture showed increasing trend with increasing levels of papaya pulp.

Colour and Appearance

The mean score for colour and appearance of milk shake were 16.04, 17.16, 18.72 and 15.36 under the treatments T₁, T₂, T₃ and T₄ respectively. The significantly highest score was (18.72) received by milk shake prepared with addition of 15 per cent papaya pulp i.e under T₃ while lowest score (15.36) was received by milk shake blended with addition of 20 per cent papaya pulp i.e T₄. The results of the present investigation are in line with the findings of Pakalwad *et al.* (2010) and Kuchekar *et al.* (2011), they prepared papaya and almond milk shake respectively and reported that the score for colour and appearance showed increasing trend with increasing levels of papaya pulp and almond in case of milk shake.

Overall Acceptability

Papaya milk shake was evaluated for its overall acceptability by the judges using 9 point hedonic scale. The scores for overall acceptability of milk shake prepared in the proportion of 95:05 (T₁), 90:10 (T₂), 85:15 (T₃) and 80:20 (T₄) milk to papaya pulp were 6.24, 7.00, 8.60 and 6.84, respectively. The score of papaya milk shake (9 point hedonic scale) prepared with addition of 15 per cent papaya pulp (T₃) was highest amongst all the treatments. From the results, it is inferred that, milk shake blended with addition of 15 parts of papaya pulp had highest overall acceptability (8.60 out of 9) as compared to 6.24 (T₁), 7.00 (T₂) and 6.84 (T₄). The results of the present study are in agreement with the findings of Kashid *et al.* (2007), they prepared golden milk shake and stated that the overall acceptability score ranged from 7.46 to 8.32.

Cost of Production

The cost of production of 1 litre papaya milk shake under various treatments was calculated by taking in to consideration the prevailing market prices for various items i.e. milk, sugar, sodium alginate and papaya. While the other charges such as labour, fuel, etc were worked out on the basis of actual hours of work performed for the preparation of 1litre papaya milk shake.

Table 2: Cost of Production of 1 Litre Milk Shake Prepared from Different Levels of Papaya Pulp (Rs)

Particulars	Treatments							
	T1		T2		T3		T4	
	Qty. (g)	Value (Rs.)	Qty. (g)	Value (Rs.)	Qty. (g)	Value (Rs.)	Qty. (g)	Value (Rs.)
Milk (lit.) @Rs.35 / lit.	950	33.25	900	31.5	850	29.75	800	28
Papaya pulp (kg) @ Rs. 40/kg	50	2.00	100	4.00	150	6.00	200	8.00
Sugar 10% @ 35/ kg	100	3.5	100	3.5	100	3.5	100	3.5
Sodium alginate (gm) @ Rs. 200/kg	04	0.80	04	0.80	04	0.80	04	0.80
Fuel charges(g) @ Rs. 600/ 14.2 kg cylinder	30	1.26	30	1.26	30	1.26	30	1.26
Electricity charges @Rs. 5/Unit	0.40	2.00	0.40	2.00	0.40	2.00	0.40	2.00
Labour charges (hrs) @ Rs. 180/ 8 hr.	1	22.5	1	22.5	1	22.5	1	22.5
Total Cost of Production	-	65.31	-	65.56	-	65.81	-	66.06

The cost of production of 1 litre papaya milk shake prepared with addition of papaya pulp at 5% (T₁), 10% (T₂), 15% (T₃) and 20% (T₄) as Rs.65.31, Rs.65.56, Rs.65.81 and Rs.66.06, respectively. As the level of papaya pulp increased the cost of production also increased. The results obtained in the present investigation are in line with the findings of Sawale (2008) who observed that the cost of production of one litre sapota milk shake under various treatments ranged from Rs. 27.83 T₁ (control), T₂ (10:90) Rs.28.86, T₃ (20:80) Rs. 28.88 and T₄ (30:70) Rs. 29.40, respectively.

CONCLUSIONS

The good quality papaya milk shake prepared with 15 parts of papaya pulp was found superior and accepted extremely by the panel of judges.. The overall acceptability score of papaya milk shake (9 point hedonic scale) prepared with addition of 15 per cent papaya pulp (T₃) was highest amongst all the treatments. The cost of production of 1 lit papaya milk shake was increased with increased in the level of papaya pulp.

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