

OPTIMIZATION OF INGREDIENTS IN PAPAYA FRUIT BAR

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ABSTRACT

Papaya fruit is an important source of certain vitamins and minerals. The fruit bar is mainly used for the products prepared by dehydration of fruit pulps. To prepare fruit bars, Papaya pulp were first blended in different proportions to standardize parameters like pectin and SMP concentration and then mixture was dried in mechanical dehydrator at $55 \pm 2^\circ\text{C}$ for 8-10h. By using different concentration of pectin, SMP, we observed the main ingredients of Papaya fruit bar which is carbohydrate and water. It is a very good source of vitamin A. By using papaya fruit bar fruit jam, jelly, ice cream, etc food can be processed.

Key words: Papaya pulp, pectin, Skimmed Milk Powder, Processed food

INTRODUCTION

Papaya or paw-paw is a popular tropical fruit but originated in America. Papaya fruit is an important and economical source of certain vitamins and minerals and it has therapeutic values Papaya is cultivated as nutritious fruits which are consumed as table fruits as well as in processed forms. There are so many uses of it as in treatment of piles, dyspepsia of spleen and liver, digestive disorders, diphtheria and skin blemishes (1). The fruit bars or fruit-slabs or fruit-leather are mainly used for the products prepared by dehydration of fruit pulps (2). Several types of fruit bars, canned fruits, frozen slices, beverages, fruit leather, are developed using different fruits, singly or in combination (3). Mature fruits mainly contain tannins and carbohydrates. Among carbohydrates, free sugars mainly glucose, fructose and galactose form a major portion, and starch is also found in small quantities. The fruit also contains 1.13% saponin, which makes the fruit bitter.. Ascorbic acid content decreases eventually with the

ripening of fruit. Papaya contains higher percentage of β -carotene as compared to other fruits (4). Papaya is an ingredient for different uses throughout the world. Unripe fruits are consumed as vegetables and ripe papaya is usually consumed fresh as dessert fruit and after processing it can also be used in a variety of products such as fruit juices, jams, and ice cream, dried fruit. The papaya fruit contain 88.8% water, 9.8 % carbohydrate, 0.8% fiber, 0.6%protein, 0.6% ash and 0.1% fat. A 100g of papaya has 39 calories (5). Papaya is a very good source of vitamin A (6).

MATERIALS AND METHODS

Fruit bars are made from pulpy fruits or by mixing the pulps of fruits that are commercially in demand. Fruit bars are high calorie foods and are a rich source of the vitamins and minerals. Fruit bars mainly made out of fruit pulps contain most of the ingredients and form a good nutritional supplement.

Development of fruit bar:

Uniform sized, fully ripened fruits of papaya free from any injury, disease were taken from the local market for the preparation of fruit bar. These fruits are then washed thoroughly with clean water and peeled to remove the outer skin. Pulp was extracted from the peeled fruits with the help of pulper. To the boiled pulp Pectin (2.5%), sugar (50%), Citric acid (1%), Skim Milk Powder (0-6%) were added and to form a homogenous mixture it was heated. The mixture was poured into Aluminium trays (smearred with butter) in thin layer (0.5-1 cm) and dried at $60 \pm 2^\circ\text{C}$ for 10-12 h in tray drier. The cooled fruit bar were cut in to rectangular pieces and wrapped in food grade polythene (fresh wrap).

Optimization of parameters for preparation of papaya fruit Bar:**Optimization of pectin content:**

The amount of pectin which is required for proper setting of fruit bar and to obtain uniform texture was optimized by adding pectin at different concentrations ranging from 1.5 to 3.5%. The amount of pectin was standardized and that amount was kept constant in next trials by using organoleptic evaluation.

Optimization of Skim Milk Powder:

To fortify the fruit bar skim milk powder was added in different proportions and optimization was carried and figured out.

On the basis of adding pectin and SMP in different concentration the properties of papaya bar like overall acceptability, chewability, taste, texture, and flavor was changed.

RESULTS & DISCUSSION**Optimization of parameters by organoleptic evaluation of fruit bar:**

After adding pectin and SMP in different concentration the properties of papaya bar was observed.

Optimization of pectin content of fruit bar by organoleptic evaluation :

On the basis of 5 different percentage of pectin addition, the functional properties were observed shown in table-1

Optimization of SMP content of fruit bar by organoleptic evaluation:

On the basis of five different percentage of SMP addition, the functional properties were observed and shown in table-2.

Figure 1: Optimization of pectin content of fruit bar by organoleptic evaluation

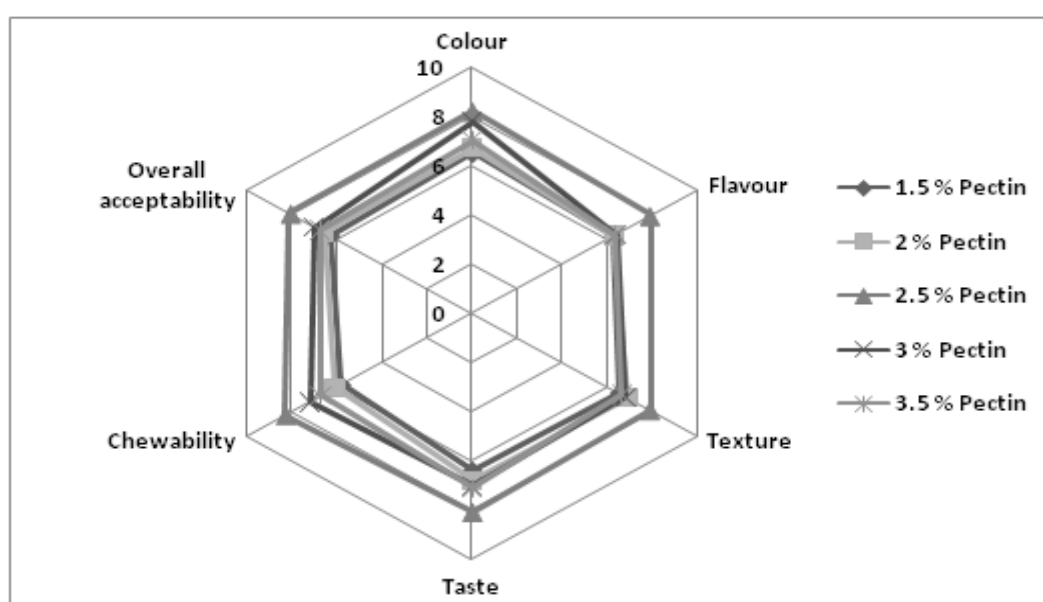
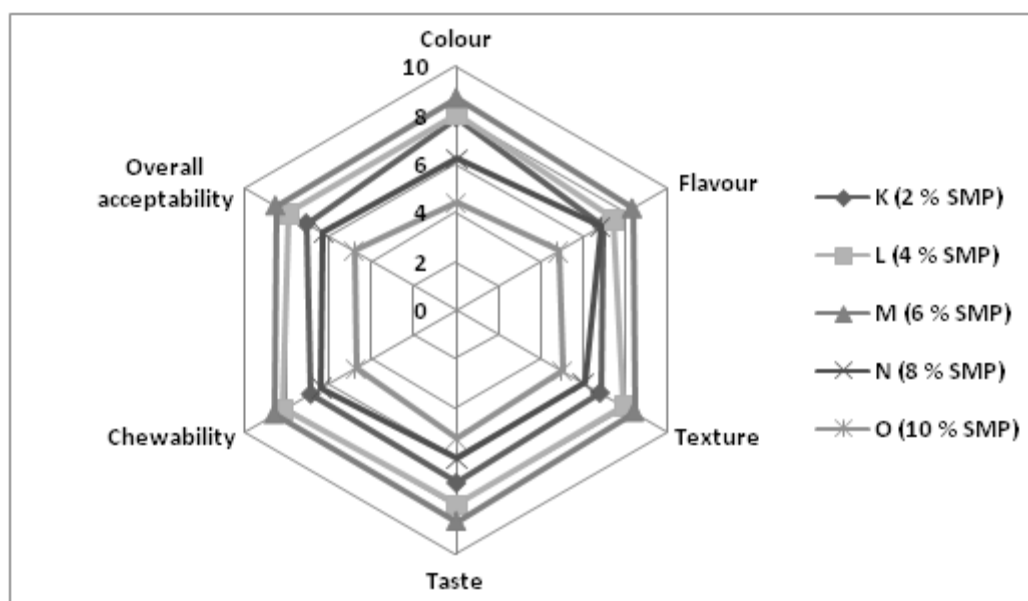


Figure 2: Optimization of SMP content of fruit bar by organoleptic evaluation**Table-1. Optimization of pectin content of fruit bar by organoleptic evaluation**

Parameter	A(1.5%)	B(2%)	C(2.5%)	D(3%)	E(3.5%)
Color	6.5 ± 0.44	6.9±0.40	8.4±0.40	7.8±0.77	7.02±0.32
Flavor	6.2 ± 0.24	6.5±0.22	7.5±0.22	6.8±0.48	6.4±0.44
Texture	6.5 ± 0.31	6.6±0.35	7.9±0.48	6.77±0.50	6.66±0.38
Test	6.4±0.25	6.9±0.23	8.15±0.77	7.1±0.72	7.11±0.50
Chewability	5.9±0.24	6.2±0.20	8.30±0.78	7.2±0.75	6.6±0.74
Overall acceptability	6.28±0.09	6.66±0.18	8.00±0.22	7.00±0.36	6.77±0.76

All the values are mean "±" SD of five values.

Table-2. Optimization of SMP content of fruit bar by organoleptic evaluation

Parameter	F(2%)	G(4%)	H(6%)	I(8%)	J(10%)
Color	7.9±0.49	8.2±0.63	8.76±0.40	6.3±0.44	4.8±0.90
Flavor	6.9±1.02	7.6±0.33	8.23±0.40	6.83±1.22	5.6±0.70
Texture	6.8±0.40	7.92±0.22	8.42±0.37	6.3±1.02	5.2±0.89
Test	7.1±0.66	8.25±0.33	8.71±0.25	6.4±0.35	5.4±1.22
Chewability	6.9±0.80	8.00±0.20	8.62±0.38	6.7±0.55	4.89±0.74
Overall acceptability	7.12±0.41	7.9±0.32	8.64±0.16	6.5±0.60	4.8±0.56

All the values are mean "±" SD of five values

After observing table 1&2 we can conclude that addition of pectin and fortification of skimmed milk powder at higher levels in sample D,E,I, and J affects the color, flavor, texture, test, and chewability of fruit bar. The average score of

sample D, E, I and J is 7.00, 6.77, 6.5, and 4.8 respectively.

From organoleptic evaluation of papaya fruit bar the optimize recipe was obtained and from which the highest is given in the table 3.

Table-3. The highest optimized recipe

Ingredients	Amount (%)
Papaya pulp	50
Sugar	55
Citric acid	0.92
Pectin	1.03
Skim Milk Powder	5

CONCLUSION

Conclusively, it emerges that papaya fruit bar fortified with skimmed milk powder can successfully prepared by using papaya pulp, sugar, citric acid in a specific percentage and the mixture is dried in a mechanical dehydrator at $55 \pm 2^\circ\text{C}$ for 8-10 h and thus the recipe was optimized. According to the organoleptic qualities, bar fortified was excellent followed by Nutritional quality particularly protein, fat, crude fibre and calorie content increased with increasing SMP (0-6%) in fruit bar. Supplementing the value added papaya fruit bar to preschool children and adolescents will be a promising effort to reduce malnutrition.

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