

Carotene rich papaya sauce - A food product innovation

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ABSTRACT

The developing countries, like India, with second largest population in the world, is facing problem related to vitamin A deficiency among people especially in children. Developing carotene rich food product would help preventing such deficiency diseases. The present study involves development of papaya sauce and its variations. The formulated product was evaluated with the help of nutritional chart and acceptability trial chart. Sensory acceptability test was also performed. The result demonstrated the developed papaya sauce to have high sensory acceptability.

Key Words : Papaya sauce, Sensory evaluation, Acceptability chart, Nutritive value

INTRODUCTION

India is developing country, around 65% of population live in village. Due to ignorance and lack of knowledge, people are not aware of nutritional importance of fruits and vegetables in the diet. Fruits and vegetables play a very important role in human diet as they are essential for maintenance of good health. They provide valuable roughages which promote digestion and help to prevent constipation. Fruits and vegetables supply carbohydrate, vitamin, protein and mineral. Vitamin deficiency leads to night blindness, biota spot, cataract, Zerophthalmia etc. Night blindness is one of the most common deficiencies disease seen especially in children. It occurs due to deficiency of vitamin 'A' in the diet.

The prevalence of vitamin A deficiency (VAD) in developing countries among young children alone is estimated to be 30%, about 163 million cases (United Nations System Standing Committee on Nutrition, 2010) and pregnant and lactating women are often affected as well, in some cases at alarmingly high levels (Ncube *et al.*, 2001). Out of this, almost 40-50 thousand children are from India.

Vitamin A is essential for growth and differentiation of a number of cells and tissues (Strobel *et al.*, 2007). They are cheaper and better sources of protective foods (Yoshikawa *et al.*, 2000). Vitamin 'A' is a descriptor for compounds with the biological activity of retinal where the vitamin functions in the visual pigments. Due to their similarities to retinal, the compounds are called retinol.

In different regions during certain parts of the year the perishable fruits are available as seasonal surplus and they create a glut in the market but in off-seasons they become scarce. India

has also emerged as top fruit producer in the world. However, distressing aspect is that as much as 25-30% of the total fruit produced in India get spoiled in the absence of infrastructure for appropriate fruit harvest technology. If they are supplied in fresh or preserved form throughout the year for human consumption, the post-harvest losses can be minimized and more variety of wholesome nutritious and acceptable foods will be available to the people (Agarwal and Mangaraj, 2005).

As the traditional goods are being developed into convenient fast food, the idea of getting ready to serve vitamin and mineral based soup and other products, seems to have bright future, by making papaya sauce, pickle, chutney etc. from papaya ripe and raw, it will enhance nutritive value profitability digestibility and overall acceptability of the product.

Scope and statement of problem:

In the recent years processed food products especially ready to serve, are gaining popularity in the global market. Various kinds of pickles, chutney, sauce etc. have become an important part of meals whereby they are used as experiment express various formulated food and food powder have gained popularity because of their nourishing, appetizing qualities and have created as new food habits.

Papaya (*Carica papaya*) is an excellent source of vitamin A and vitamin C (Singh *et al.*, 2015). Papaya on other hand has good amount of vitamin 'A' vitamin 'C' and minerals and has excellent digestibility and palpability. Papaya is seasonal fruit and vegetable, respectively. They are not highly perishable and easily available at low prices during the peak season.

Objectives:

- Therefore investigation is done with the following objectives:
- To study the feasibility of utilizing papaya for making sauce.
 - To standardized the process of papaya.
 - To study the chemical quality of papaya sauce.
 - To perform sensory evaluation, acceptability trails of all products

METHODOLOGY

The present study was carried out using the following methodology:

Method of enquiry and collection of acceptability taste chart:

The selected respondent personally tasted the product and necessary information collected using acceptability taste chart.

Tools of study:

- Cooking method
- Acceptability taste

Method of analysis:

The tubular method was used for analyzing the chart.

Method of preparation of papaya sauce:

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Ingredients		
Food stuffs	Amount	Cost (Rs.)
Ripe papaya	200 g	2.00
Sugar	120 g	3.60
Onion	7g	0.20
Garlic	2g	0.04
Dalchhini	½ inch	0.20
Salt	1 teaspoon	0.07
Cardamom	1	0.21
Red chili powder	1 teaspoon	0.08
Acetic acid	½ teaspoon	0.12
Sodium Benzoate	1 pinch	0.27

Method:

- Peel and cut papaya. Boil in 100 ml water for 13 minutes.
- Strain and take out the pulp.
- Mix pulp and sugar and heat for 20 minutes.
- Mix acetic acid, sodium benzoate and spices to the pulp and heat till it becomes slightly thick.
- Pour the sauce while still hot in air tight container.

Total weight:

- Total weight of sauce- 315 gm
- Total cost: Rs. 6.79

Nutritive value					
Food stuff	Amount (g)	Energy (kcal)	Carotene (µg)	Vitamin C (mg)	Calcium (mg)
Ripe Papaya	200	64	1332	114	34
Sugar	120	477.6	-	-	14.4
Onion	7	4.2	-	0.51	2.8
Garlic	2	3	1	1	1
Total	329	548.8	1333	115.51	52.2

Variation - (I):

It is same as basic recipe but 120 gm jaggery used instead of sugar.

Nutritive value					
Food stuff	Amount (g)	Energy (kcal)	Carotene (µg)	Vitamin C (mg)	Calcium (mg)
Ripe Papaya	200	64	1332	114	34
Jaggery	120	459.2	-	-	96
Onion	7	4.2	-	0.51	2.8
Garlic	2	3	1	1	1
Total	329	566.4	1333	115.51	133.8

Variation - (II):

It is same as basic recipe but 60 g sugar and 60 gmjaggery was used instead of 120 g sugar.

Nutritive value					
Food stuff	Amount (g)	Energy (kcal)	Carotene (µg)	Vitamin C (mg)	Calcium (mg)
Ripe Papaya	200	64	1332	114	34
Jaggery	60	229.6	-	-	48
Sugar	60	238.4	-	-	9.6
Onion	7	4.2	-	0.51	2.8
Garlic	2	3	1	1	1
Total	329	539.2	1333	115.51	95.4

RESULTS AND DISCUSSION

Sensory evaluation :

When the quality by food product is assessed by means of sensory organs, the evaluation is said to be sensory or subjective. Sensory quality is a combination of different senses of perception coming into play in choosing and eating a food. Appearance, flavor and mouth feel decide the acceptance of food.

Sensory characteristics of food:

Food has several characteristics that require evaluation by sensory method. These attributes include flavour, texture, appearance, colour and consistency.

Appearance:

Surface characteristics of food products contribute to the appearance.

Colour:

Colour is used as an index to the quality of a number of foods

Flavor:

The flavor of food has three components- odour taste and a composite of sensation known as mouth feel.

Odour:

The odour of food contributes immeasurably to the pleasure of eating.

Taste:

The taste sensation which the taste buds register are categorized as sweet, salt, sour or bitter.

Mouth feel:

Texture, consistency and hotness or burning sensation of food can be felt in the mouth.

Texture:

Texture of foods depends upon the size of crystals.

Consistency:

Food may be too hard or too soft which can be found out by mouth feel. Quality is the ultimate criterion of the desirability of any food product. Food quality can be evaluated by sensory and

objective methods.

Following results are obtained during the acceptability trial test.

Number of judges: 60

Age group: 19-45

Acceptability Trial Chart																
Trial chart of papaya sauce																
Recipe	Taste					Consistency			Appearance				Acceptability		Total	Rank
	E	VG	G	F	TS	S	L	SL	E	VG	G	TS	Yes	No		
Papaya sauce	28	20	10	2	60	-	-	SL	34	24	2	60	56	4	812	I
Score	224	120	40	4	388	-	-	SL	272	144	8	424	-	-	-	-
Variation I	4	16	30	10	60	-	-	SL	8	12	40	60	20	40	564	III
Score	32	96	120	20	268	-	-	SL	64	72	160	296	-	-	-	-
Variation II	12	28	14	9	60	-	-	SL	24	20	16	60	34	26	708	II
Score	96	168	56	12	332	-	-	SL	192	120	64	376	-	-	-	-

E = Excellent, VG = Very Good, G = Good, F = Fair, TS = Total Score, Y = Yes, N = No, L = Liquid, SL = Semi Liquid, S = Soft, T = Total

Rank order:

Papaya sauce > variation II > variation I. *i.e.* 812 > 708 > 564

According to taste chart appearance scores papaya sauce is more accepted by people than its variations.

Conclusion :

The prepared product of papaya (papaya sauce) is economical, cheap, easily available, easy to manufacture and highly nutritious. The carotene rich product of papaya was easily acceptable by people. The products were made with two variations. Taste and appearance play an important role in the evaluation of food so, papaya sauce was found to be more acceptable than its variations. Papaya sauce was more acceptable as its taste and appearance was excellent. Thus, this products can be used as a source of vitamin ‘A’ rich food by all age groups especially by children to remove vitamin ‘A’ deficiency. Cultivation of papaya tree in school and kitchen garden must be made more popular. Its nutritive value, ease of cultivation and early maturity (less than 9 months) are definitely advantageous.

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