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Economic Analysis of Papaya Guava Fruit Bar

A. Laxman Kumar[1*], C. Madhumathi[1], Syed Sadarunnisa[2] and P. Latha[3]

[1]Department of Fruit Science, [2]Department of Vegetable Science,
College of Horticulture, Dr. YSRHU, Anantharajupeta (A.P.), India

[3]Department of Crop Physiology, Institute of Frontier Technology, RARS, ANGRAU, Tirupathi (A.P.), India

*Corresponding Author E-mail: appanilaxman123@gmail.com

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ABSTRACT

The present investigation was carried out at college of Horticulture, Anantharajupeta with an aim to evaluate benefit cost ratio of papaya guava fruit bar .The papaya and guava pulps were blended in the ratios of 100:0, 80:20, 60:40, 50:50 and 40:60 in preparation of fruit bar from papaya cv. Red Lady and guava cv. Allahabad Safeda. Benefit cost ratio was calculated to motivate the farmers to understand the net profit in dehydrated products. From this study it is concluded that the highest benefit cost ratio (1.23) was recorded in T_2 treatment with 80 percent papaya pulp and 20 percent guava pulp followed by T_3 (1.18) with 60 percent papaya and 40 percent papaya pulp.

Key words: *Guava, Papaya, Pulp, Bar.*

INTRODUCTION

Papaya (*Carica papaya* L.) and Guava (*Psidium guajava* L.) are important tropical fruits and claims superiority over other fruits by virtue of their commercial and nutritional values. Papaya (*Carica papaya* L.) is regarded as the wonder fruit of the tropics and subtropics. It was originated in Mexico as a result of cross between the two species of the genus Carica. It is the fifth most important crop in India after mango, banana, citrus and guava. The fruit is an excellent source of vitamin A (2020 IU/100g) and also rich source of other vitamins like thiamine, riboflavin, nicotinic acid Jain *et al*[1]., India is the largest producer of papaya in the world with an annual production of about 5508 lakh tones from an area of about 126 lakh hectare NHB[2] . In Andhra Pradesh, papaya was cultivated in an area of 18.40 lakh hectares with annual production of about 1471.68 tones NHB[2]. Guava, the poor man's apple, is one of the most common fruits grown widely in tropical and subtropical regions of the world. It was originated in tropical America, stretching from Mexico to Peru and gradually became a crop of commercial significance in several countries because of its hardy nature, prolific bearing, high vitamin C content, minerals and high remuneration with less maintenance. The high vitamin C content of guava makes it a power house in combating free radicals and oxidation which are key enemies that cause many degenerative diseases Kadam *et al*[3].

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In recent years, guava cultivation has become popular due to increasing international trade, nutritional value and value added products. Guava has well-established markets in more than 60 countries. The largest producers are India, Mexico, Brazil, Cuba, Venezuela, USA, Australia, New Zealand, China, Thailand Negi and Shailendra[4]

In India, guava has become an important fruit crop contributing to 4 per cent of total fruit production and ranks fourth in production after mango, banana and citrus with an estimated production of 4083 lakh tones from 251 lakh hectares NHB database[2].

The destruction of original fruit structure by pureeing and restructuring it into dehydrated sugar-acid-pectin gels called "fruit leathers" provide attractive, coloured products. Fruit leathers also allow left over ripe fruits to be preserved Natalia *et al*[5].

Dehydrated fruit processing is gaining importance now-a-days due to long shelf life, light weight, better handling during export and providing variety to the consumers. Fruit leathers are dried sheets of fruit pulp that have a soft, rubbery texture and sweet taste.

The fresh papaya and guava fruits have limited shelf life. Therefore, it is necessary to utilize this fruit for making different products to increase its availability over an extended period and to stabilize the price during glut season. Unfortunately papaya fruit has not caught the fancy of the consumers as much as it deserves, mainly because of its odour which is not appealing and thus limits its commercial exploitation at processing levels. However, papaya fruit has blood red pulp, good taste and low acid content hence; it can be used for blending with other fruits and also for preparation of nutritional enriched food products Attri *et al*.[6]Whereas guava emits a sweet aroma which is pleasant, refreshing and acidic in flavor and besides being rich source of pectin, its pulp shows compatibility and suitability for blending and making mixed fruit products *viz*., jam, jelly, candy, leather etc. However, blending of these two fruits could be an economic preposition to utilize them profitably Jain *et al*.[1]

MATERIALS AND METHODS

The present investigation was carried out at College of Horticulture, Anantharajupeta; during the year 2015-16.The details of the materials used and methods adopted during the investigation were elucidated in this chapter under following headings.

Procurement of raw materials

Red Lady variety is a early, vigorous and high-yielding papaya variety with excellent fruit quality. Fruits are short, oblong shaped with red flesh, aromatic and very sweet. The Fruits of Allahabad safeda are medium, round, smooth with skin colour yellow on ripening, white pulped, with few medium soft seeds and have good keeping quality.

Preparation of papaya and guava pulp

Red Lady and Allahabad Safeda were used for extraction of pulp for fruit bar preparation of papaya and guava. These fruits were washed in clean tap water. Then, they were cut into pieces. By using pulp extractor papaya and guava pulp was extracted. Guava seeds were separated from pulp by sieve installed in the pulp extractor. The pulp recovery is more in papaya fruit (78.0%) when compared to guava fruit (54.5%). The papaya guava fruit bar was prepared by mixing the pulp (1kg) in different proportions as per the treatment with 250g sugar. The mixture was heated with continuous stirring till it reached to 50^0 Brix. The boiled mass was slightly cooled and 500 ppm of KMS was added.

Drying

The concentrated pulp mixture was spread on trays (smeared with ghee) up to 0.5 cm thickness and dried in cabinet drier at 60^0C. After five hours of drying, second layer of 0.5 cm thickness was spread over the first layer and continued for eight hours. The product was dried before packing.

Cutting, filling and packing

Dried sheets of each blend were cooled and cut into rectangular pieces of 3 × 0.5 cm size. The cut pieces were packed individually in butter paper and labeled with details of treatments and replications and stored at temperature 25.35° C. The fruit pulp from these varieties was blended at different proportions as per the

treatments. Papaya guava fruit bar was prepared according to the methodology given by Attri *et al*[6]., with slight modification. Then processed pulp mixture was loaded in aluminum trays and kept in cabinet dryer for drying The treatment combinations are given below.

Treatment details

Treatments	Pulp (%)	
	Papaya cv. Red Lady	Guava cv. Allahabad safeda
T_1(control)	100	-
T_2	80	20
T_3	60	40
T_4	50	50
T_5	40	60

Statistical analysis

The data for various physic-chemical attributes and sensory evaluation were analyzed by using Completely Randomized Design (CRD). The data was statistically analyzed according to Panse and Sukhatme[7]

RESULTS AND DISCUSSION

The number of labour required and wages for extraction of 100 kg pulp of various treatments are presented in table 1. The cost for one labour per day is 350 Rupees. It was evident from the preparation that the cost involvement in the preparation of papaya guava fruit bar of different treatments is different. The cost of labour charges increased as the guava pulp ratio increased in different treatments because extraction of guava pulp contains seeds takes more time and laborious process.

Table 1: Labour cost for extraction and preparation of papaya and guava fruit bar

Treatments	Papaya and guava pulp ratio	No of labours required	Cost of labour
T_1	100: 0	60	21000
T_2	80: 20	64	22400
T_3	60 : 40	68	23800
T_4	50 : 50	70	24500
T_5	40: 60	72	25200

T_1: (100% Papaya pulp), T_2: (80% Papaya pulp + 20% Guava pulp), T_3 : (60% Papaya pulp + 40% Guava pulp), T_4: (50% Papaya pulp + 50% Guava pulp), T_5: (40% Papaya pulp + 60% Guava pulp); Allahabad Safeda (AS).

The raw material and other costs include electricity bill, sugar, cost of papaya and guava fruits, preservative, packing cost of papaya guava fruit bar.

Table 2: Total expenditure on raw materials and packaging of papaya guava fruit bar

SL NO	Particulars	In Rupees (per 100kg pulp)
1	Electricity bill	5000
2	Sugar	1000
3	Preservative (KMS)	800
4	Cost of papaya and guava fruits	3000
5	Packing	100
	Total Cost	**9900**

Table 3: Benefit cost ratio of papaya guava fruit bar

Treatments	Total cost	Gross income	Net income	Benefit Cost Ratio
T_1	30900	25000	5900	0.80
T_2	32300	40000	7700	1.23
T_3	33700	40000	6300	1.18
T_4	34400	40000	5600	1.16
T_5	35100	40000	4900	1.13

T_1: (100% Papaya pulp), T_2: (80% Papaya pulp + 20% Guava pulp), T_3: (60% Papaya pulp + 40% Guava pulp), T_4: (50% Papaya pulp + 50% Guava pulp), T_5: (40% Papaya pulp + 60% Guava pulp); Allahabad Safeda (AS).

CONCLUSION

The dehydrated products like papaya and guava fruit bar will have an extended shelf life and help the farmers to reduce the post-harvest losses. The papaya guava fruit bar with T_2 treatment 80% Papaya pulp + 20% Guava pulp recorded highest benefit cost ratio 1.23 because number of labour required for processing and preparation of papaya guava fruit bar is less compared to T_3 ,T_4 and T_5. For every one rupee invested in preparation of fruit bar there would be benefit of another 1.23 Rupees as per T_2 treatment.

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