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Preserved Products from Mango (*Mangifera indica* L.) and its Financial Analysis and Beneficiaries Cost Ratio

D. Bommy¹ and S. Kavitha Maheswari²

¹Department of Foods and Nutrition, Mother Theresa Women's University, Kodaikanal & Training Assistant (Home Science) in PKKVK, Pondicherry, India

²Department of Food and Nutrition, Govt Arts and Science College, Dindigul, India

*Corresponding author

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A B S T R A C T

Mango is summer fruit and grows in a large quantities in India during the months of April to August. This study is carried out to emphasis on the mango can be made available in all season through preservation and the farmers can economically balance their income through preservation on off-season. Financial Input needed to prepare a preserved products from mango is assessed. Beneficiaries cost ratio was calculated to motivate the farmers to understand the net profit in selling the preserved products. It's a research to motivate the farmers in such a way to understand the preservation may done using the simple methods and it is easy process if they follow the principles and guidelines properly.

Introduction

Mango is the national fruit of India, known as the 'King of Fruits' and possess the Botanical name *Mangifera indica*. It is one of the most important and popular Asian fruits. Cultivation of Mangoes is deeply embedded in Indian history. Mangoes are mentioned in early Atrialkrit literature. Mangoes thrive in tropical regions, and are cultivated throughout India and even in home yards, along field boundaries and roadside avenues. They, later spread to the rest of Asia by themselves and with the help of humans. They have been cultivated, praised and revered since ancient times.

Usually all the quantity of food grown in a region cannot be consumed by the people there as there is usually excessive production. And the farmers usually transport the mangoes to other regions where there is need of mangoes or not availability of that particular variety. If the farmers don't do that the excess of production will rot and become waste. So the farmers can preserve the mangoes in the form of jam, squashes and as pickles.

Mango Nutrition

The fruit contains nearly 81 per cent moisture, 0.4 per cent fat, 0.6 per cent

proteins, 0.8 per cent of fibers. It also contains nearly 17 per cent of carbohydrate. The fruit is rich with important minerals

contains important minerals like Potassium, magnesium, Sodium, Phosphorus'

Moisture %	Fat %	Protein %	Fiber %	Carbo-hydrate %	Minerals mg/100g					Vitamins mg/100g	
					K	Na	Mg	P	S	Carot-ene	C
81	0.4	0.6	0.8	16.9	205	26	270	16	17	2743	16

Source: FAO

In addition to sumptuous tropical flavor, Mangos deliver a host of nutrients and make healthy eating a delightful sensory experience. Mangoes are an excellent source of vitamins A and C, both important antioxidant nutrients. Vitamin C promotes healthy immune function and collagen formation. Vitamin A is important for vision and bone growth.

Mangoes are a good source of dietary fiber, therefore, it is associated with a reduced risk of some types of cancer, protecting against heart disease and cholesterol build up. Mangoes contain over 20 different vitamins and minerals.

Economic Importance

Mangoes are widely available year-round, as fresh fruit and in frozen and processed foods. The fruit is very popular with the masses due to its wide range of adaptability, high nutritive value, richness in variety, delicious taste and excellent flavour. The fruit is consumed in both forms raw and ripe.

Raw fruits of local varieties of Mango trees are used for preparing various traditional products like raw slices in brine, amchur, pickle, murabba, chutney, panhe 7 (sharabat) etc. Raw fruit of local varieties of Mango

are used for preparing pickle and raw slices in brine on commercial scale while fruits of Alphonso variety are used for squash. Mango also has medicinal uses. The ripe fruit has fattening, diuretic and laxative properties. It helps to increase digestive capacity.

Major mango producing countries in the world

Mango is commercially grown in more than 80 countries. Main Mango producing countries are Brazil, China, Egypt, India, Indonesia, Mexico, Pakistan, Phillipines, Thailand and Vietnam .

Major mango producing states in India

Mango is grown in India in tropical and subtropical regions from sea to an altitude of 1500 meters. It is grown almost in all states of India.

However, it is mainly cultivated in, Andhra Pradesh, Bihar, Gujarat, Karnataka, Kerala, Maharashtra, Orissa, Tamil Nadu, Uttar Pradesh and West Bengal.

Varieties of Mangoes Famous In Tamilnadu

Some varieties of mangoes famous inTamil Nadu are Banganpalli, Bangalora, Neelum,

Rumani, Mulgoa, Alphonso, Kalepad, Sendurga, Malguavo, Immampasant, Kallmai

Processed Products of Mango

Being mango is perishable, huge amount of fresh mango loose marketability due to over ripening. The shelf life of fresh produce can be extended by processing banana into various value added products.

Presently many processing techniques are available to convert the fresh produce into their value addition products such as squash, cordial and RTS(Ready to Serve Products), jam, wine, puree, bars, dehydrated pieces, mango milk shake powder, Mango Flour, Mango chips and sweet coat mangoes from specific varieties. Some of the products preparations are discussed below:

Specific Objectives

1. Preservation technology of the mango will make availability in all season.
- 2.Examine the financial analysis for the small scale level production
- 3.Calculation of Beneficiaries cost Ratio

Methodology

The ingredients were purchased in the local market of puducherry and prepared the preserved items. The receipie used to develop the product is based on the recommended technology by training institutes and research institutes.

The product is prepared in household level using the utensils from the kitchen following the sterilization process.

Initial and Final weight of the product is measured. Financial input is calculated

according to the quantity and items used for the preparation . Beneficiaries cost ratio is calculated after the market survey.

Methods of preservation technologies painstaking for study

Mango squash

This is a type of fruit beverage containing atleast 25 percent fruit juice or pulp and 40 to 50 per cent total soluble solids, commercial. It also contains about 1.0per cent acid and 350 ppm sulphur dioxide or 600 ppm Sodium Benzoate. It is diluted before serving.

Ingredients needed

Mango Pulp:1 kg, Sugar:1.600gm,
Citric Acid:10 gm, Potassium Meta Bisulphite-1.5 gm,
Water:1.400 litre

Method

Step -1: Mango is grinded into pulp, Sugar and citric acid are dissolved and heated with water.

Step -2:Add the grinded mango pulp into the sugar syup.

Step -3:The mixed syrup is filtered through muslin cloth to skin off the dirt and allowed to cool to room temperature.

Step -4:Potassium Meta Bisulphite is added to the squash and mixed well.

Step -5:The squash is filled in sterilized bottles leaving 1” head space and capped airtight.

Financial analysis-mango squash

Expenditure on raw materials and packaging

Sl.No	Particulars	Qty(kg)	Unit cost(in Rs.)	Total cost(in Rs.)
1	Mango Pulp	1 kg	80	80
2	Sugar	1.600	38	56
3	Citric Acid	10 gm	100	1
4	Potassium Meta Bisulphite	1.5 gm	300	1
5	Food Grade Bottles	5	6	30
			Total	168

Beneficiaries Cost Ratio

Finished Products using raw materials=3 ltrs

If Rate Fixed for selling 1 litre=Rs,140,for 3 ltrs=Rs.420

Net Profit=Gross Profit-Cost of Production= 420-168= 252

BCR=Income/Expenditure=420/168=2.5

2. Mango Jam

Process for Making Jam

Ripe firm fruits \Rightarrow Washing \Rightarrow Peeling \Rightarrow Pulping \Rightarrow Addition of sugar, pectin and acid \Rightarrow Boiling with continuous stirring) \Rightarrow Judging of end point by sheet test \Rightarrow Filling hot into sterilized bottles \Rightarrow Cooling, capping and \Rightarrow Storage at ambient temperature.

Jam is a product made by boiling fruit pulp with sufficient quantity of sugar to a reasonably thick consistency, firm enough to hold the fruit tissues in position. It can be prepared separately from one kind of fruit of from two or more kinds of fruits.

Ingredients Needed

Mango-1 kg, Sugar-1 kg, Citric Acid-10 gm, Sodium Benzoate-10 gm, Mango Essence-10 ml

Financial analysis-mango jam

Expenditure on raw materials and packaging

Sl.No	Particulars	Qty(kg)	Unit cost(in Rs.)	Total cost (inRs)
1	Mango	1 kg	60	60
2	sugar	1 kg	38	38
3	Citric Acid	10 gm	1	1
4	Sodium Benzoate	1 gm	1	1
5	Mango Essence	10 ml	4.30	4.30
6	Packaging Items	11	33	33
			Total	137

Beneficiaries Cost Ratio

Finished Products using raw materials=1 kg

If Rate Fixed for selling 1 litre=Rs,220

Net Profit=Gross Profit-Cost of Production=
220-137=83

BCR=220/139=1.5

Mango Fruit Bar

Fruit Bar or leather is a ready to eat,semi-moist food with soft gel like texture obtained by dehydration of fruit purees into leathery sheets. These products are generally shelf stable and can be stored safely for longer time at room temperature in polyethylene or in any type of flexible laminate pouches. In addition, it contains sufficient dissolved solutes to decrease water. Fruit bars are prepared by drying fruit pulps after adjusting acidity and sugar concentration to a desired level. For the Preparation of bar, extraction of Mango pulp is done. Fully ripe mango is washed, peeled, cut into small pieces and poured into a pulper machine to get uniform pulp.

Ingredients needed

Mango pulp-1 kg,milk powder-100gm,sugar-200gm,citric acid-3 gm,kms-1gm

Method

Step1:Mix Fruit pulp with milk powder, sugar, citric acid and KMS.

Step 2:Ran the mixie along with the mixture for 15 mins

Step 3:Boil it till reaches the consistency.

Step 4Pour into aluminium trays smearing with butter.

Step 5:Kept for another 1 hour

Step 6:Cut the bar and Packed in polyethylene pouches

Financial analysis-mango bar

Expenditure on raw materials and packaging

Sl.No	Particulars	Qty(kg)	Unit cost	Total cost
1	Mango	1 kg	60	60
2	sugar	200 gm	8	8
3	Citric Acid	10 gm	1	1
4	Sodium Benzoate	1 gm	1	1
5	Milk Powder	100gm	35	35
			Total	105

Beneficiaries Cost Ratio

Finished Products using raw materials=700 gm

If Rate Fixed for selling 1 kg =Rs.250,for 700 gm=175

Net Profit=Gross Profit-Cost of Production=
175-105=70

BCR=Income/Expenditure=1.6

4. Raw mango pickle

Pickle

Pickles are a very important accompaniment that are most often made from certain varieties of vegetables and fruits that are

finely chopped and marinated in brine or edible oils along with various indian spices.

Ingredients Needed

- Cuttet pieces of Mango-1 kg
- Oil-300ml
- Mustard-10gm
- Asofoetida powder-5 gm
- Turmeric powder-10 gm
- Salt-90 gm
- Chillie powder-80 gm

Method

Step 1:Wash the Mangoes thoroughly .

Step 2:Remove the seeds and cut into pieces.

Sl.No	Particulars	Qty(kg)	Unit cost(in Rs)	Total cost
1	Mango	1 kg	30	30
2	Oil	300 ml	40	40
3	Mustard	10 gm	1	1
4	Asafoetida	1 gm	1	1
5	Turmeric Powder	10gm	1.80	1.80
6	Salt	90 gm	1.2	1.20
7	Chillie Powder	50 gm	12	12
8	Vinegar	20 ml	4	4
9	Packaging Item	10	20	20
			Total	111

Beneficiaries Cost Ratio

Finished Products using raw materials=1 kgm

If Rate Fixed for selling 1 kg =Rs.250

Net Profit=Gross Profit-Cost of Production=
250-111=139

BCR=Income /Expenditure=250/111=2.2

Conclusion

The preserved products prepared will have a extended shelf life from 1-2 months.The

Step 3:Mustard is seasoned with oil and allow the mango to cook in oil with turmeric powder, asofoetida powder and salt.

Step 4:Then add the chillie powder and Masala Powder till it reaches the consistency.

Step 5:Mix the preservative well in the pickle and allow it to cool and then store it in the clean container.

Financial analysis-mango pickle

Expenditure on raw materials and packaging

preserved products will help the farmers to reduce the Post Harvest Losses. Farmers can extend their business by establishing the production unit . The consumer acceptance method may influence for the standardization of the product. Quality test in the labs for preserved product will support for marketing. License for their finished product in the Food Safety Office sustainance the promotion of the product. Based on the findings of this study it is hereby recommended that this technology and financial analysis will support the Farmers to increase their income and made availability of the mangoes in all season.

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