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## Enhancing income of farm women through value added product tamarind sauce

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### Abstract

The present study was conducting in Balaguda and Ralayata adopted villages of KVK Mandsaur; under On Farm Testing (OFT) program 18 farm women were selected purposely for Income generation through value addition making tamarind Sauce product. To study the various demographic & Socio-Economic parameter's a prescheduled interview Performa and questionnaire was developed; Product were also evaluated for Sensory parameters viz; taste, color, texture, flavor overall acceptability and shelf life. Data were analyzed, and simple mean percentage was calculated. The results for Socio-economic attributes' majority of the respondents were literate and only few 11.00 per cent respondents were illiterate. Additional Income Increased 20.52 % in improved method compare to traditional method. Farm women are generating income through value addition and nutritional security through tamarind sauce in rural areas. It can be helpful to manage market price instability and losses of tamarind fruits.

**Keywords:** income generation, tamarind sauce, farm women, sensory parameter

### Introduction

Tamarind (*Tamarindus indica* L.) grows especially in parts of sub-continent and it's a major native fruit tree. The tamarind fruit is edible mush used in different methods of cooking in over the whole world. The tamarind fruit was well-known to the by gone Egyptians and Greeks during 4th century B.C. Tamarind is originated from Eastern Africa place known as Madagascar. India is one of the major producer and consumer of tamarind in the world Havinga *et al.* (2010) [3]. The fruit is nice source of calcium, phosphorus, iron and vitamins and also contains small amounts of vitamin A and C Manjula, *et al.* (2017) [5]. Fruit pulp of tamarind is soft and thick, with brown/ reddish brown in colour, around 55 per cent is filled with fruit pulp, remaining 34 per cent part is seed and 11 per cent are shell respectively Yahia *et al.* (2011) [13]. The pulp also contains high levels of, carbohydrate, protein, calcium, phosphorus, fibre, iron, vitamin B2 and some vitamin C Singh *et al.* (2007) [11]. The fruit is consumed raw or utilized in juice, jam, syrup, candy, curries, salads, seasonings, and for preparing sauces. India is that the largest producer (300,000 tons) and exporter of tamarind pulp followed by Thailand (140,000 tons) and 45% of tamarind trees are planted only for fruit pulp of food and medicinal value Narina, *et al.* (2018) [6]. The tamarind production is comparatively greater size in India. According to the spice board of India, the area of tamarind was 74.20 (000' ha), production was 309.44 (000' MT) and the productivity was 4.0 (MT/ha) in 2017-18 respectively. Tamarind is allotted to processed 258.70 (000'MT) to 272.85 (000'MT) for value addition products in India. Even though, traditional processing is widespread, its commercial uses are unknown and underdeveloped. Fruit is the most useful part of tamarind tree; it contains a sweetish, acidic pulp, which is mainly used for souring curries, sauces, chutneys and certain beverages Divakara, (2008) [2]. Tamarind fruit used to make different value added products, such as tamarind powder, tamarind juice, tamarind concentrate, tamarind paste, tamarind kernel powder, tamarind pickle, tamarind sauce, tartaric acid, pectin, tartrates and alcohol Siddig *et al.* (2006) [8]. Tamarind paste has many culinary uses including a flavoring for chutnies, curries and the traditional sharbat syrup drink. Sweet chutney made by tamarind is well-liked in India which is used in dressing many Indian snacks. Storage of tamarind for elongated time it becomes a trouble and found lots of physicochemical changes Kakade, (2004) [4]. The processing and preservation of tamarind is important for value added products within the effective way to preserve the contents of fruits. The present investigation was undertaken to assess the value added product Tamarind Sauce for enhancing the income of farm women in district Mandsaur of Madhya Pradesh.

## Methodology

The present study was conducting in Balaguda and Ralayata villages; under On Farm Testing (OFT) program purposely for value addition of tamarind as Imli Sauce product in both the villages are situated in the periphery of 08 and 15 Kms from jurisdiction of Krishi Vigyan Kendra, Mandsaur district of M.P. Randomly 18 farm women were selected who are engaged in making tamarind (Imli) sauces, they belongs to marginal and small land holding farm women group. A scheduled interview and pre questionnaire was developed to study the various demographic parameters and extensive review of the value addition training of respondent of villages. Demonstration of value added product as Tamarind Imli (Sauce) is prepared by boiling tamarind pulp in sufficient sugar and acid. Tamarind sauce is brownish-black coloured has been prepared as per norm of FASSAI specifications. The following equipments and materials were used for making Tamarind (Sauce) product. Items are tamarind pulper, cooking utensils, hand refractometer, measuring cylinder, weighing balance, muslin cloth, glass bottles and chemical preservative- II Sodium Benzoate etc. Preparation of Tamarind (Sauce) from ripe tamarind (Pulp) sugar should be added and heat should be low to dissolve it, before increasing the heat to boil the mixture. The pulp is then is mixed with other ingredients and continuous stirring/ scraping should be done. The end stage of boiling – using a refractometer and the desired end stage for sauce/ puree is 25° brix. Sugar, salt and condiment spices are the additives utilized in tamarind sauce making. Sugar is added @ of 1 kg per kg pulp, while salt is typically added @ of 30g per kg pulp. Spice usage can be a customised formula. This needs to be standardized. Spices used should be clean and in good condition. Some need to be roasted before use. The common spices used are Cumin, Cloves, Mace, Black pepper, Cinnamon, dry ginger powder, red chilli powder, etc. A basic standard spice mix includes red chilli powder, roasted cumin powder and dry ginger powder. Preservative such as Sodium Benzoate and Pottassium metabisulphite added to sauces to help preserve the products as per FASSAI specification. Product was evaluated for Sensory parameters viz; taste, color, texture, flavor overall acceptability and shelf life. Data were analyzed and simple mean percentage were calculated as formula is given below

Practice method as compared to traditional method

(1) Total cost per output kg/day

= total expenditure in Rs /total produce in kg /day

T1 (FWP) = 2520/60.50 = 41.65

T2 (IP) = 2520/61.25 = 41.14

(2) Net Return in Rs /Day

= Gross profit in Rs -Total expenditure in Rs

T1 (FWP) = 3176.25-2520.00 = 656.25

T2 (IP) = 3828.12-2520.00 = 1308.12

(3) Benefit Cost Ratio(BCR)

= Gross profit /Cost of input

T1 (FWP) = 3176.25/2520.00 = 1.26

T2 (IP) = 3828.12/2520.00 = 1.51

(4) Income Change Increase %

= (Net return /Cost of input) x100

T1 (FWP) = 656.25/2520.00 = 26.04

T2 (IP) = 1308.12/2520.00 = 51.90

(5) Additional Income %

= (Higher income –Lower income/Lower income) x100

T2 (IP) = (3828.12-3176.25/3176/25) x 100 = 20.52

## Results and Discussion

Demographic Profile of family It was (Table-1) It is clear from the study that about 50.00 per cent of respondents were studied up to primary education, followed by 30.00 per cent of the respondents have studied up high school education and 08.00 per cent of them studied up to studied up to graduation. Thus, it can be concluded that majority of the respondents were literate and only few 11.00 per cent respondents were illiterate. The results could be attributed to the availability of free basic education and the educational infrastructure in the study area. The minority of achieved the higher education which reflects their affordability and interest to gain good knowledge. The distance of higher study centers from the village might have contributed for only few being educated above high school. Similar results are also reported by Roy *et al.* (2013) [7]. In case of type of family majority of 75.00 per cent belonged to nuclear family system, 25.00 per cent respondent's belonged to joint family system. Thus, it can be concluded that majority of the respondent's belonged to nuclear family system. These finding for annual income, majority of farmers earn less than Rs 10,000/ month. Similar results are reported by (Singh, 2012) [10]. It is depicted (Table 3) Cost of output per kg/day was Rs. 60.50 in farm women traditional method and Rs. 61.25 in improved method. Improved practice increases production per unit 41.14 percent, while net return for improved method Rs 1308.12 per unit production over traditional method Rs 656.25 respectively. The benefit cost ratio was found (1.51) in improved method whereas (1.26) in traditional method. The results to monetary benefits as additional income increased 20.52 percent in improved method compare to traditional method, similar result reported by Tripathi *et al.* (2017) [12] income generation through Tomato Ketchup. Singh *et al.* (2017) found same results, where farm women income enhanced significantly through formation of women group, trainings, processing and value addition of mango in Unnao district of Uttar Pradesh. Chaudhary *et al.* (2014) [1] also reported that income of small and marginal farmers almost tripled following training for good orchard of Oranges organize marketing and value addition in Chamoli district of Uttarakhand.

The data (Table 4) revealed that sensory parameters viz., colour, texture, flavor, taste and overall acceptability were found superior in improved practice method as compared to the traditional method. Our results are supported by Tripathi *et al.* (2017) [12].

**Table 1:** Demographic profile of the farm family

S. No.	Parameters	Villages	
		Balaguda	Ralayata
1.	No. of Household	613	390
2.	Gender	Male - 1327 Female - 1285 Total - 2612	Male - 853 Female - 879 Total - 1732
3.	Type of family		
	a. Nuclear	76 %	75 %
	b. Joint	24 %	25 %
4.	Literacy level		
	a. Illiterate	09 %	11 %
	b. Primary	50 %	52 %
	c. Higher secondary	30%	31 %
	d. Graduate and above	11 %	06 %
5.	Income of the family / month		
	Less than Rs 10000	82%	85 %
	Rs 10000-20000	13%	12 %
	Rs 20000-40000	03%	02 %
	More than Rs. 40,000	02%	01 %

**Table 2:** Ingredient used for formulation of Tamarind (Imli) (Sauce)

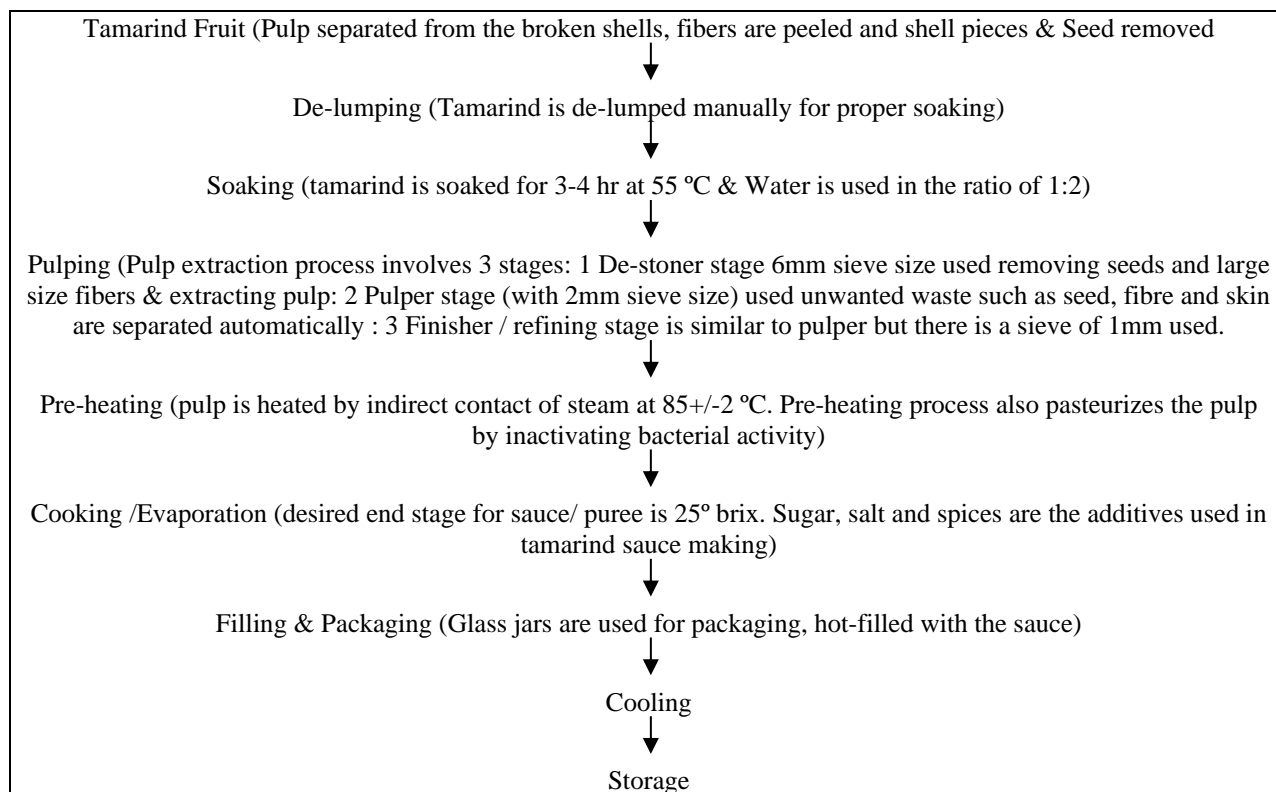
S. No	Ingredient	Quantity
1.	Tamarind (Imli)	40.000 kg
2.	Pumpkin( kaddu)	15.000 kg
3.	Beet root	5.000 kg
4.	Garlic	0.500 kg
5.	Onion	3.000 kg
6.	Ginger	1.000 kg
7.	Cumin	0.700 kg
8.	Clove	0.050 kg
9.	Cardamom (big)	0.100 kg
10.	Cardamom (small)	0.075 kg
11.	Cinnamon	0.100 kg
12.	Jawitri (flower)	0.050 kg
13.	Black pepper	0.100 kg
14.	Dalchini	0.050 kg
15.	Red chili (powder)	0.250 kg
16.	Sugar	6.000 kg
17.	Juggery (gud)	1.000 kg
18.	White Salt	0.600 kg
19.	Black salt	0.200 kg
20.	Glacial acetic acid	0.020 ml
21.	Sodium Benzoate @ per kg product	750 PPM

**Table 3:** Economic parameters of processed product of Tamarind (Imli) Sauce

Particulars	KVK, Mandsaur	
	FP	IP
No of Trials	18	18
No. of Farmers involved	18	18
Crop	Tamarind	Tamarind
Cost of input (Rs./kg)	2520.00	2520.00
Output production (kg/day)	60.50	61.25
Cost of production per kg (in Rs)	41.65	41.14
Goss profit (in Rs )	3176.25	3828.12
Net return (in Rs )	656.25	1308.12
B.C. Ratio	1.26	1.51
Income increases %	26.04	51.90
Additional income increase %	-	20.52

**Table 4:** Organoleptic evolution of the fortified processed product of tamarind sauce

Product	Attribute's				Overall acceptability	Shelf life (days)
	Colour	Texture	Flavour	Taste		
T1 (FP)	4.5	4.6	5.5	5.9	5.3	85
T2 (IP)	6.1	5.5	6.8	7.1	6.5	355



Flow chart for making tamarind sauce

## Conclusion

Value added product of tamarind sauce increase the income of farm women and it could be a start up for small scale entrepreneur for rural area. The benefit cost ratio was found increased in improved method over the traditional method, where additional Income Increased 20.52 % in improved method compare to traditional method. Farm women are generating income through value addition and nutritional security through tamarind sauce in rural areas. It can be helpful to control market price fluctuation and losses of tamarind fruits. It is possible only through on farm demonstrations, trainings, formation of self help groups, marketing linkages and financial support.

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