

RESEARCH PAPER

Processing management in pomegranate fruit – A case study of squash making

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ABSTRACT

The present study on processing management of pomegranate squash making was conducted in Koppal and Vijayapura districts of North Karnataka based on the highest area and production and higher concentration of pomegranate fruit processing units with the objective to analyze the value addition process and its economics. The results were based on primary data collected, with the sample size of twenty wholesalers cum commission agents, four processing units and twenty retailers from each district. The total cost incurred by the pomegranate squash processor, wholesaler- cum- commission agent and retailers in processing, storing, transporting and marketing hundred lit of squash was Rs. 8904, Rs. 211 and Rs. 102. The net price received by them after deducting marketing charges is accounted for Rs. 2298, Rs. 1665 and Rs. 2400 per hundred liters, respectively. The extent of value addition was found to be 58 per cent along with the processors share in consumer's rupee to the tune of 57 per cent. Non-availability of infrastructure facilities like cold storage, grading and processing were the major problems faced by the value chain actors in its value addition and are the resultant of lower returns in value addition and its marketing. Therefore, suitable infrastructure facilities are essential to stabilize the returns of fruit growers and other value chain actors in fruits value chain, by increasing the storage life of the fruits by adding value to them in different ways by different value addition processes.

KEY WORDS : Value chain, Retailer, Squash making, Pomegranate squash

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Agriculture forms the backbone of the Indian economy contributing 13.7 per cent at 2013 prices to the gross domestic product and providing livelihood support to about two-third of the country's population. Horticulture crops being high value crops provide excellent opportunity for raising income of the farmers even in dry land areas. The state is third largest producer of fruits accounting for 12 per cent of the fruits produced in the country.

Pomegranate occupies the 12th position among all fruits produced in the country accounting only 1.6 per cent of total fruit production with higher nutritive value. The total area under cultivation of pomegranate crop in

India during 2013-14 was 113.2 thousand hectares with production of 745 thousand tones. Maharashtra stands first with highest in area and production in pomegranate of about 745 thousand ton of production, contributing about 57.6 per cent of the total pomegranate area of the country followed by Karnataka (13.01%), Andra Pradesh (2.68 %) and Tamil Nadu (0.48 %) (Kusuma, 2014).

Bijapur and Koppal were the leading districts in North Karnataka with respect to area and production of pomegranate. The total area and production of pomegranate in Koppal was 3455 hectares and 41417 tons, accounting for nearly 42.10 and 49.14 per cent of area and production of pomegranate in north Karnataka, respectively during 2011-12. Bijapur (18.72 %), Bellary (16.87 %), Bagalkot (13.73 %) and Belgaum (3.47 %) are the other major pomegranate growing districts of north Karnataka. The average productivity of pomegranate in the state was 12.79 tons per hectare during 2013-14.

This study would throw further light on the avenue for future research in the area of horticulture in general and value chain of fruits in particular. Due to the diversity of environmental condition in India, There is vast market potential in the domestic and export market which is yet to be tapped. There is tremendous scope for varietal improvement and development of processing industry based on these results.

METHODOLOGY

Based on the higher concentration of area and production of pomegranate, two districts and two talukas from each district for *i.e.* Koppal (Gangavathi and Yelburga talukas) and Vijayapura (Vijayapura and Sindagi talukas) of north Karnataka were purposively chosen for the study. To elicit the required data regarding value addition processes at different stages like procurement, sorting, grading, processing, packing, storage,

transportation, two processing units, five wholesalers or assemblers (wholesaler cum commission agents) and five retailers from each taluka for selected fruit crop were selected randomly. Thus, a total of 4 processing units, twenty wholesalers and twenty retailers were selected for the study from the selected regions. The study was exclusively based on the primary data which was collected from the producers, processors, wholesalers cum commission agents, retailers and other functionaries who are involved in value chain of pomegranate, with the help of pre-tested, comprehensive questionnaire. The data was summarized and analyzed with the help of statistical tools like averages, percentages and ARIMA model for forecasting the demand of pomegranate fruit for next five years.

ANALYSIS AND DISCUSSION

Results of study are presented in Tables 1-5. Table 1 depicts the details of different costs incurred in procurement of raw materials in value addition of pomegranate into 100 lit of squash. It can be noticed from the table that, on an average the total cost (Rs. 4650) incurred in procuring 30 lit of pomegranate pulp (Rs.155/lit) with its commission charges (Rs. 93), sugar syrup of 68.25 lit for Rs. 1774.5 and 1.75 kg of preservative for Rs. 490. The other items which contributed to the total procurement cost are labour charges (Rs.53), grading and weighing (Rs.1) and transportation (Rs.71), all together constituted the total procurement cost of Rs. 7133.

The cost of processing hundred lit of pomegranate squash is presented in Table 2. It can be seen from the table that the average total cost of processing 100 lit of squash was found to be Rs. 7810.5, in which the total variable cost (Rs.7756.5, 99.31%) formed the major component. The total fixed cost being Rs. 54 accounted for only 0.70 per cent of the total cost of processing.

Sr. No.	Particulars	Pulp	Sugar syrup	Preservative	Total
1.	Quantity required	30 lit	68.25 lit	1.75 kg	-
2.	Purchase value (Rs.)	4650	1774.5	490	-
3.	Commission (2%) (Rs.)	93	-	-	-
4.	Labour (Rs.)	53.33	-	-	-
5.	Grading and weighing (Rs.)	01	-	-	-
6.	Transportation charges (Rs.)	71	-	-	-
	Total (Rs.)	4868.33	1774.5	490	7132.83

Out of the total variable costs, the procurement cost of 30 lit of pomegranate pulp Rs. 5115 (65.5%) was found to be maximum followed by sugar syrup of 68.25 lit of Rs. 1774.5 (22.72%), preservatives of 1.75 kg of Rs. 490 (6.27%). The cost of power, fuel, water (1.28%) wages to casual labour (0.13%) and interest on working capital accounted for 3.14 per cent of the total cost of processing.

In the total fixed cost (Rs.54), salary to the permanent employees was found to be the major component accounted for 0.45 per cent (Rs. 35) followed

by depreciation on equipments (0.08%). The remaining items including depreciation on building, insurance and license fee and interest on fixed capital, together accounted for 0.17 per cent of the total cost of processing hundred liters of pomegranate squash. Similar findings were reported by Khunt *et al.* (2003) in which the total fixed cost was of Rs. 38.

It can also be observed from the Table 3 that the total marketing costs incurred by the processor, wholesaler and retailer in marketing 100 lit of pomegranate squash were found to be Rs. 300, Rs. 211

Table 2: Cost of processing pomegranate pulp into squash				(Per 100 lit of squash)	
Sr. No.	Particulars	Unit	Price (Rs./ unit)	Quantity	Total (Rs.)
Variable cost					
1.	Pomegranate pulp procurement cost	Litres		30	4868.33 (62.33)
2.	Sugar syrup	Litres	26.00	68.25	1774.50 (22.72)
3.	Preservatives	Kg	280.00	1.75	490.00 (6.27)
4.	Power, fuel and water	Rupees	-	-	203.00 (2.60)
5.	Wages on casual labour	Rupees	-	-	55.67 (0.71)
6.	Interest on working capital	Rupees	-	-	265.00 (3.39)
7.	Repairs and maintenance	Rupees	-	-	25.00 (0.32)
	Total variable cost			-	7681.5 (98.35)
Fixed cost					
1.	Interest on fixed capital	Rupees	-	-	17.50 (0.22)
2.	Depreciation on buildings at 5%	Rupees	-	-	10.00 (0.13)
3.	Equipment depreciation cost	Rupees	-	-	6.00 (0.08)
4.	Salary to the permanent employees	Rupees	-	-	90.00 (1.15)
5.	Insurance and license fee	Rupees	-	-	5.50 (0.07)
6.	Total fixed cost	Rupees	-	-	129.00 (1.65)
	Total processing cost	Rupees		-	7810.50 (100)

Table 3 : Marketing costs in marketing of value added products of grapes and pomegranate					
Sr. No.	Particulars	Pomegranate squash making units (Rs./100 lit)			
		Processor	Wholesaler	Retailer	Total
1.	Transportation	38.00(12.67)	35.00(16.60)	30.00(29.51)	103.00(16.80)
2.	Rent	6.00(2.0)	5.00(2.37)	3.50(3.43)	14.50(2.37)
3.	Electricity	15.00(5.0)	4.00(1.90)	4.00(3.92)	23.00(3.75)
4.	Value of storage losses	3.00(1.0)	10.00(4.74)	10.00(9.80)	23.00(3.75)
5.	Grading	1.00(0.33)	5.00(2.37)	8.00(7.8)	14.00(2.28)
6.	Packing material	200.00(66.67)	120.00(56.87)	10.00(9.80)	330.00(53.83)
7.	Weighing and packing	4.00(1.33)	8.00(3.79)	4.50(4.41)	16.50(2.89)
8.	Loading and unloading	8.00(2.67)	9.00(4.27)	7.00(6.86)	24.00(3.92)
9.	Advertisement cost	25.00(8.33)	15.00(7.11)	25.00(24.50)	65.00(10.60)
	Total	300.00	211.00	102.00	613.00

Note: Figures in parentheses indicate percentage to total

Table 4: Costs and margins in marketing of pomegranate squash

Sr. No.	Particulars	Pomegranate	
		Squash (Rs./100 lit)	
		Rs.	%
1.	Processors purchase price	4650.00	30.46
2.	Cost of the processor	8590.50	57.05
3.	Selling price of processor	10888.12	71.32
4.	Margin of the processor	2298.50	14.26
5.	Wholesaler's purchase price	10888.12	71.32
6.	Cost of wholesaler	211.00	1.38
7.	Selling price of wholesaler	12765.00	83.61
8.	Margin of wholesaler	1665.00	10.91
9.	Purchase price of retailer	12765.00	83.61
10.	Cost of the retailer	102.00	0.67
11.	Selling price of retailer	15267.00	100.00
12.	Margin of retailer	2400.00	15.72
13.	Consumer's purchase price	15267.00	100.00
14.	Marketing margin/price spread	10617.00	69.54
15.	Processor's share in consumer rupee (%)		57.05

Note: WS = Wholesalers

CA = Commission agents

Table 5: Demand forecast of the pomegranate fruit for different value addition process

Sr. No.	Year	Actual demand (000 MT)
1.	2001-02	664.90
2.	2002-03	792.50
3.	2003-04	849.00
4.	2004-05	840.00
5.	2005-06	858.00
6.	2006-07	807.00
7.	2007-08	820.00
8.	2008-09	743.00
9.	2009-10	772.00
10.	2010-11	745.00
11.	2011-12	1346.00
12.	2012-13	1357.00
13.	2013-14	664.90
14.	2014-15	792.50
	CAGR (%)	7.70
Forecast demand		
15.	2015-16	1419.92
16.	2016-17	1482.84
17.	2017-18	1545.75
18.	2018-19	1608.67
19.	2019-20	1671.59

and Rs. 102, respectively, out of total marketing cost of Rs. 613. Out of Rs. 300 in the case of processor, 66.67 per cent (Rs. 200) of the marketing cost was incurred on packing material, followed by transportation cost of Rs. 38 (12.67%) and advertisement cost of Rs. 25 (8.33%).

In the case of wholesaler, out of Rs. 211, the major item was found to be packing material cost (56.87%), transportation (16.60%), advertisement cost (7.11%). The other remaining items totally constituted 19.42 per cent of the total marketing cost. Out of total total marketing cost (Rs. 102) incurred by the retailer, transportation cost was found the maximum and it was of Rs. 30, (29.51%). The next item was found to be the advertisement cost (24.5%), followed by value of storage losses and packing material (9.8% each). The remaining items accounted for 35 per cent of the total marketing cost of 100 lit of pomegranate squash.

In marketing of 100 lit of pomegranate squash by the different value chain actors, the total marketing cost was found to be Rs. 613. Out of which, packing material (53.83%), transportation (16.80%) and advertisement cost (10.60%) accounted the maximum of the total marketing cost. The other items altogether constituted to the tune of 18.77 per cent of the total marketing cost. Pomegranate was marketed through various intermediaries starting from the producer to the ultimate consumers.

The intermediaries involved rendered a variety of services in the process of marketing of pomegranate with a view to earn some profit. The margins of the intermediaries can act as an indicator of the efficiency of the marketing system. The marketing margin and price spread in marketing of pomegranate in the study area is presented in Table 4. The processor incurred a total cost of Rs. 8,591 which included his cost of procurement, processing, storage and marketing in processing pomegranate pulp into 100 lit of pomegranate squash and sells at Rs. 10,888 (71.32%) with a profit of Rs. 2,298 (14.26%) per 100 lit of squash. The wholesaler purchases at Rs. 10,888 and sells at Rs. 12,765 after adding his marketing cost of Rs. 211, with a profit of Rs. 1,665 (10.91%). Finally, the retailer after adding his marketing cost of Rs. 102, sells at Rs. 15,267 with a profit of Rs. 2,400 (15.72%) to the consumers. Around Rs. 15,267 was found to be the consumers purchase price with the marketing margin or price spread of Rs.

10,617 and processors share in consumers rupee was 57.05 per cent.

With the help of annual growth rate (AGR) computed based on fourteen years data, demand estimation was done for selected for pomegranate fruit and is presented in Table 5. It is worth noting from the Table 5 that, the average annual growth rate (AGR) of demand for pomegranate was found to be 0.77. Estimated demand for pomegranate were 1419.92, 1482.84, 1545.75, 1608.67 and 1671.59 thousand metric tons for the years 2015-16, 2016-17, 2017-18, 2018-19 and 2019-2020.

Conclusion :

A value chain from the agricultural point of view is a system that links farmers to the needs of consumers while working closely with suppliers and traders to produce the specific goods to meet the demands of the end consumers. Based on the findings of the study, the necessary steps have to be taken up in the areas of production, varietal development, processing and investment for machineries and marketing of pomegranate fruits and its value added products. Because of availability of huge and modernized technologies and also the existence of modern processing units in other states and even in South Karnataka, the pomegranate is undergoing value addition and it converted into different value added products like bottled juice, syrups and jelly, and jams. But the situation in North Karnataka is totally different. Here, it is used only for table purpose and squash preparation of lack of different value adding or processing units. So there is a wide scope and opportunities in expanding this business in processing field. So that the players can accrue greater benefits of higher margins compared with present situation. The state government may give due attention for providing proper approach roads to the villages. It should also provide scientific storage facilities to help the farmers to store the fruits, as there is more storage loss and thus intermediaries can save their produce in cold storages.

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