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**ECONOMIC ANALYSIS OF PROCESSING INDUSTRY WITH SPECIAL  
REFERENCE TO DRY JAMUN SLICES BY DEHYDRATION IN PUNE DISTRICT  
OF MAHARASHTRA**

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**ABSTRACT**

**1. BACKGROUND-**

India ranks third in the production of dried fruits and vegetables. The industry is largely decentralized and India has a large number of small-scale units having small capacities up to 250 tons per annum. The commercial production of processed fruits and vegetables is very low in India, contributing only to around 2.2 percent of the total food production.

Dehydrated fruits and vegetables projects are a new product of value addition series where the shelf life is increased & space for storage is reduced along with easy transportation. Demand for fruits and vegetables are prevalent across length and breadth of the country throughout the year. However, due to specific climatic requirements availability/supply of most of these crops is seasonal. So, preservation through dehydration technique can play an important role

**2. OBJECTIVES-**

The research outlook was studied with following points.

- 1) To study capital investment of the processing industry
- 2) To calculate the performance and feasibility parameters of the processing industry

**METHODOLOGY-**

The dehydration unit "Naturals Agro Private Limited" located at Manjari Budruk in Pune district has been selected purposively for working out economics of dehydration of fruits and vegetables. Primary data were collected with the help of personal interaction with the Company Managing Director and Workers. Secondary data were collected from annual report, internet and company records.

**4. ANALYSIS OF DATA-**

This is done with the help of various type of mathematical & statistical tools like graph, table, charts & various formulas. The data phased on fixed cost, variable cost, Net Present worth, Breakeven point, Benefit cost ratio and payback period to work out the efficiency and feasibility of processing industries.

**5. RESULT-**

1. B:C Ratio of Dry Jamun is more than one hence it indicates that the given processing of fruits and vegetables i.e. Natural Agro is quite profitable. hence Project is financially feasible.



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2. The estimated BEP of Dry Jamun indicates that the production of dry Jamun slices is much more than BEP point, hence it indicates that the unit is in its profitable stage.

**Key Words-** Dehydration, Dehydrated products, Project cost, Dry Jamun Slices Processing, Financial ratio

## 1. INTRODUCTION

India is known as the second largest fruits and vegetables producer in the world followed by China. India accounts for about 15 per cent of the world's vegetable production. In the production of many fruits and vegetables, India is either first or second. However, fruits and vegetables being perishable in nature, get wasted to the tune of 20-30 per cent in the whole supply chain due to poor post-harvest management. On the other hand, only 2 per cent of fruits and vegetables are processed in to value added products and the rest is consumed as fresh. Therefore, processing of fruits and vegetables offers immense scope for wastage minimization and value addition; thus, can generate significant income and employment in Indian agrarian economy.

Agro-processing is now regarded as the sunrise sector of the Indian economy in view of its large potential for growth and likely socio-economic impact specifically on employment and income generation. Some estimates suggest that in developed countries, up to 14 per cent of the total work force is engaged in agro-processing sector directly or indirectly. People generally prefer fresh fruits and vegetables in India due to abundance of seasonal fruits throughout the year available at low price. However, in the recent years, processed foods in the form of canned fruits such as pineapple, Mango slices and pulps, grapes, apple, peaches etc have increased considerably. The uses of fruits in the form of concentrated juice, dry powder, jam and jelly have also increased.

Fruits and vegetables are seasonal as well as perishable in nature. Through processing (dehydration) vegetables can be used as raw vegetables for cooking. With the help of fresh vegetables value added products such as pickle, sauce, chips etc. can be prepared. Dehydration of seasonal fruits and vegetables are good bet for long term storage even up to 5 years or beyond if hermitically sealed and can be made available to the consumers during off season. Dehydrated vegetables are used to manufacture instant vegetable noodles, soups, snacks and fast food. There is immense scope of market for certain popular and high value dehydrated seasonal fruits and vegetables.

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## 3. RESULTS AND DISCUSSION-



### 3.1 Dehydrated Products Range

There is wide range of agricultural products which can be dehydrated and marketed locally or internationally. The information on dehydrated products viz; vegetables, fruits and medicinal plants of selected unit is given in Table 1.1, Table 1.2 and Table 1.3, respectively.

**Table 4.1 Dehydrated Vegetables produced in Naturals Agro unit**

Spinach Powder	onion powder	Drumstick powder	Spinach Powder
Bottle Gourd Powder	Basil Leaves Powder	Tomato Powder	Methi Powder
Curry leaf Powder	Dry Cococasia	Mint Powder	Beet Powder
Ginger Powder	Garlic Powder	Palak Powder	Moringa Leaves Powder

**Table 4.2 Dehydrated Fruits produced in Naturals Agro unit**

Dry Jamun	Dry Pineapple	Awala Candy	Dry Banana
Tamarindus indica Powder	Dry Mango cubes	Amchur Powder	Dry Ber
Jamun beej Powder	Awala Supari	Raw mango Powder	Orange Powder

**Table 4.3 Dehydrated Medicinal plants produced in Naturals Agro unit**

Lemon Grass Powder	Shikekai Powder	Gulab Powder	Stevia Powder
Lemon Grass, Ginger, Cardamom Mix Powder	Ritha Powder	Awala Powder	Laxmi Taru

### 4.2 Fruits and Vegetables Dehydration Temperature and Moisture level

**Table 4.4 Dehydration Temperature and Moisture level**

Sr. No.	Fruits and Vegetables	Drying Conditions			Finished Products	
		Load/batch (Kg)	Temp. (°C)	Time (hr.)	Moisture (%)	Yield /batch (Kg)
1.	Dry Jamun	70	50 to 55	14	2 to 7	5.5
2.	Dry Ambadi	25	45 to 50	12	8 to 12	1
3.	Moringa Powder	50	42 to 48	12	4.5 to 5.65	4.5
4.	Onion Flex	50	50 to 55	10	Less than 7	5
5.	Mango Cubes	10	50 to 55	16	10 to 15	2



**4.3 Percentage loss of selected fruits and vegetable in processing Table 4.5 Percentage loss of selected fruits and vegetable**

Sr. No.	Fruits and Vegetables	Loss (%)
1.	Dry Jamun	10 to 15
2.	Dry Ambadi	5 to 10
3.	Moringa Powder	3 to 5
4.	Onion Flex	1 to 2
5.	Mango Cubes	20 to 30

**4.4 Project Cost**

This research suggests a plant with an average capital investment Rs. 51,83,000, with minimum human resource requirement of five people, where at least one manager is mandatory. The average electricity and water costing for processing unit is 3,90,000.

**Table 4.6 Capital investment**



Sr. No.	Items	Rate (Rs)	Amount	Total Amount	Percentage
1	Acquisition of Land (2.5 R)	10,00,000	25,00,000	25,00,000	48%
2	Water structure				
	a) Bore well (1)	68,000	68,000	68,000	1%
3	Construction of building	-	20,00,000	20,00,000	39%
4	Machinery and Equipments				
	1. Tray dryer (1)	3,50,000	3,50,000		
	2. Pulverizer (1)	65,000	65,000		
	3. Grader (1)	45,000	45,000		
	4. Packing (2)	2,500	5,000		
	<b>Total</b>			4,65,000	9%
5	Furniture	-	1,50,000	1,50,000	3%
6	Insurance premium rate	-			

#### 4.5 Human Resource Requirements

For running a small processing unit, a single manager is sufficient for managing all the activities which are carried out in processing unit and minimum human resource requirement is as follows:

**Table 4.7 Human Resource Requirements**



Labour	Numbers	Working days/month	Salary/Month (Rs.)	Annual Salary (Rs.)
Male ( Rs.300)	1	25	7,500	90,000
Female (Rs.250)	4	25	6,250	300,000
<b>Total</b>	<b>5</b>			<b>3,90,000</b>

Particulars	Amount
Electricity	1,44,000
Water	60,000
<b>Total</b>	<b>2,04,000</b>

#### 4.6 Electricity and Water Charges

The fruits and vegetables processing unit average electricity and water charges as given below

#### Table 4.8 Electricity and Water

#### 4.7 About Jamun

The selected processing unit had wide range of products which is shown in dehydrated product range. The further research is taken with the consideration of Jamun fruit. Jamun is a very nutritious summer fruit that has a wide range of health benefits. The fruit is commonly called the Indian blackberry, Java plum, or black plum. Jamun is a healthy and nutritious fruit that's packed with a variety of nutrients. It's a rich source of antioxidants, calcium, phosphorus, and flavonoids. It also contains other nutrients like sodium, thiamine, riboflavin, carotene, fiber, niacin, folic acid, protein, and fat.

It's a fruit that has been used in Ayurvedic treatments and medications since ancient times. You can find Jamun in two varieties – one is the white flesh variety, and the other is the purple flesh jamun. It is known to treat many health conditions such as heart problems, diabetes, skin issues, infections, asthma, stomach pain, flatulence, and a lot of other medical problems.



#### 4.8 Procurement of Jamun

As the Jamun is seasonal fruit, the harvesting period of Jamun is mainly in the month of June and July, the procurement schedule of Jamun is given below

**Table 4.9 Procurement of Jamun**

Sr. No.	Month	Procurement (Kg)	Cost /(Kg)	Total Cost
1	June	402	100	40,200
2	July	564	80	45,120
<b>Total</b>		<b>966</b>	<b>180</b>	<b>85,320</b>

#### 4.9 Processing of dry Jamun slices

The actual procurement quantity of raw Jamun is given in table 3.11 but while processing of Jamun on an average 10 to 15% loss is occurred. The table given below shows the actual quantity which is processed in selected processing unit.

**Table 4.10 Processing of dry Jamun slices**

Sr. No.	Month	Jamun (Kg)	Dry Jamun	Price of raw jamun
1	June	350	28	35,000
2	July	490	39	39,200
	<b>Total</b>	<b>840</b>	<b>66</b>	<b>74,200</b>

#### 4.10 Flow chart of dehydrated jamun slices



#### 4.11 Income during the year

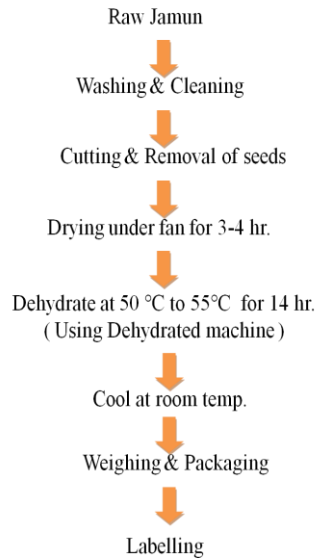
Table 4.11 Income during the year

Sr. No.	Particulars	Amount
1.	Fixed Cost	11,830
2.	Fixed cost Per kg.	179.24
3.	Variable Cost	1,38,860
4.	variable cost per kg.	2,103.95
5.	Total Production in kg	66
6	Cost of Production (Rs./kg.)	2,283
7.	Price Realized (Rs./kg)	4,000
8.	Total cost (Rs.)	1,50,690
9.	Total Income (Rs.)	2,64,000
10.	Profit (Rs.)	1,13,309
11.	Profit /Kg (Rs.)	1,717





**Flow Chart of Dehydrated Jamun**



#### 4.12 Financial Ratios

**Table 4.12 Financial Ratios**

Sr. No.	Ratio	Answers
1.	Benefit Cost Ratio	1.7
2.	Break Even Point (Algebraic method kg.)	6.2
3.	Break Even Point (Monetary Form Rs.)	24,646.27
3.	Contribution of Margin /unit	1,896.05
4.	Total contribution	1,25,139.3
5.	Total profit	113,309.09
6.	Actual sales	2,64,000
7.	Margin of Safety	2,38,829.34
8.	Percentage Margin of Safety	90%



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**4.**

**CONCLUSIONS-**

1. Average per kilogram processing cost of Dry Jamun is Rs. 2,283.
2. Average profit per kilogram of Dry Jamun 1,717.
3. B:C Ratio of Dry Jamun is more than one hence it indicates that the given processing of fruits and vegetables i.e. Natural Agro is quite profitable. hence Project is financially feasible.
4. The estimated BEP of Dry Jamun indicates that the production of dry Jamun slices is much more than BEP point, hence it indicates that the unit is in its profitable stage.
5. The given financial ratios analysis concluded that the processing unit of fruits and vegetable with small capacity can also give optimum profit and which is far more profitable for further investments.

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