

Economic analysis of processing industry with special reference to onion flex by dehydration method in Pune district of Maharashtra

Godase NA and Rao GS

Department of Management, College of Management,
MIT Pune, Maharashtra, India

Corresponding author: godaseneha212@gmail.com

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ABSTRACT

Aim: The aim of the study was to examine the capital investment of the processing industry and to calculate the performance and feasibility parameters of the processing industry.

Materials and Methods: 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 with special reference to Onion flex. 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. The data were analyzed to work out the efficiency and feasibility of processing industries.

Results: The total Procurement of Onion was 2,550 kg which cost Rs. 12,750 which was procured in the month of January, February and March. B:C Ratio Onion Flex was 1.2, it indicates that the B:C ratio is more than so these product is profitable to run the processing unit.

Conclusion: 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.

Keywords: Dehydration, dehydrated products, onion flex, financial ratio.

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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 fruits and 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

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available to the consumers during off season. Dehydrated vegetables are used to manufacture instant vegetable noodles, soups, snacks and fast food. Onions are a good source of vitamins, minerals, and fibre and are known to offer a variety of health benefit. The research was aimed to study capital investment of the processing industry and to calculate the performance and feasibility parameters of the processing industry

Materials and Methods

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

Results and Discussion

Dehydrated Products Range

There was 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 was recorded (Table 1 to 3).

Table 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 2. Dehydrated Fruits produced in Naturals Agrounit

Dry Jamun	Dry Pineapple	Awala Candy	Dry Banana
Tamarindus indica Powder	Dry Mangocubes	Amchur Powder	Dry Ber
Jamunbeej Powder	AwalaSupari	Raw mango Powder	Orange Powder

Table 3. Dehydrated Medicinal plants produced in Naturals Agrounit

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

Fruits and Vegetables Dehydration Temperature and Moisture level: Dehydration Temperature and Moisture level of Fruits and Vegetables were recorded (Table 4).

Table 4. Dehydration temperature and moisture level

S.No.	Fruits	DryingConditions				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

Percentage loss of selected fruits and vegetable in processing: Percentage loss of selected fruits and vegetable were recorded (Table 5).

Table 5. Percentage loss of selected fruits and vegetable

Sr.No.	FruitsandVegetables	Loss (%)
1.	DryJamun	10 to 15
2.	DryAmbadi	5 to 10
3.	MoringaPowder	3 to 5
4.	OnionFlex	1 to 2
5.	MangoCubes	20 to 30

Project Cost: This research suggested 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 electricityand water costing for processing unit is 3,90,000.

Table 6. Capital investment

Sr. No.	Items	Rate(Rs)	Amount (Rs.)	Total Amount (Rs.)	Percentage (%)
1	Acquisition of Land (2.5R)	10,00,000	25,00,000	25,00,000	48%
2	Waterstructure				
	a)Borewell(1)	68,000	68,000	68,000	1%
3	Constructionofbuilding	-	20,00,000	20,00,000	39%
4	Machinery andEquipment's				
	1.Traydryer (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		
	Total			4,65,000	9%
5	Furniture	-	1,50,000	1,50,000	3%
6	Insurancepremiumrate	-			

Human Resource Requirements

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

Table 7. Human Resource

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
Total	5			3,90,000

Electricity and Water Charges

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

Table 8. Electricity and Water

Particulars	Amount (Rs.)
Electricity	1,44,000
Water	60,000
Total	2,04,000

About Onion flex

The selected processing unit had wide range of products which was shown in dehydrated product range. The further research is taken with the special consideration of Onion flex.

Procurement of Fresh Onion in Kg and prices at different time period in (2021-22)

The data of total procurement of fresh onion by company was collected and recorded (Table 9).

Table 9. Procurement prices at different time period of Fresh Onion

S. No.	Month	Procurement (Kg) / Rs. 5	Total Price (Rs.)
1	Jan	1020	5,100
2	Feb	1020	5,100
3	March	510	2,550
Total		2,550	12,750

It provided the information about the quantity of fresh onion was procured 1020 kg, 1020 kg and 510 kg with the price Rs.5 per kg in the month of January, February and March respectively. The peak procurement was done in the month of January, February and March while lean in when the prices were high in the market. Similar findings were corroborated by Baisya (2004).

Detail procedure of Onion flex-

Fresh Onion: Take fresh onion without any damage and rotten.

Cutting and Cleaning: Cut top and bottom part of onion, peel it and wash it with water and clean it with cotton cloth

Manual slicing: Manually slice onion with approximately 4mm in size

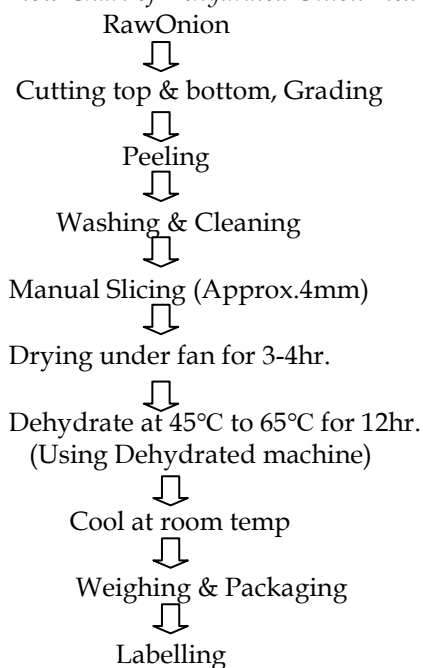
Drying: Dry in shadow for 3-4 hours.

Dehydration: Put slices on tray and put trays in to dehydrator at 45°C to 65°C for 12 hours. And check it with every 2-3 hours and turn the slices.

Cooling: After 12 hours remove the trays from dehydrator and cool leaves at room temperature.

Weighing and packaging: After cooling at room temperature weight it and pack it.

Labelling: Label the packets according to different sizes.

Flow Chart of Dehydrated Onion Flex*Processing cost of Onion Flex*

Processing Quantity of dryonion flex and price of raw onion was mentioned (Table 10)

Table 10. Processing Quantity of onion flex (2021-22)

S.No.	Month	Onion (Kg)	Dry Onion Flex (Kg)	Total Price (Rs.)
1	Jan	1000	100	5,000
2	Feb	1000	100	5,000
3	March	500	50	2,500
Total		2,500		12,500

It provided the information about the quantity of dry onion flex processed 8 kg, 9 kg and 10 kg in the month of January, February and March respectively. 1000 kg fresh onion required for making 100 kg dry onion flex.

Per unit Cost of processing of Dry Onion Flex

The process of converting raw material into final product have some value addition. So that, there was some cost required to process the product. Per unit Cost of processing of Dry Onion Flex were mentioned (Table 11). Similar findings were corroborated by Maanas and Kshirod (2019).

It was showed that fixed cost and variable cost required for processing. Total fixed cost and variable cost required for processing was ₹44,764.79 and ₹55,341.66 respectively. The fixed cost and variable cost per kg was ₹ 179.05 and ₹ 221.36.

Table 11. Perunit Cost of processing of Dry Onion Flex

S.No.	Particulars	Amount (Rs.)
a)	Fixed Cost	
	Depreciation on Fixed Assets	6,638.79
	Interest on fixed capital	38,126
	Total fixed cost 250 kg.	44,764.79
	Fixed cost Per kg.	179.05
b)	Variable cost	
	Raw Material cost (2500kg)	12,500
	Wages	23,907
	Electricity Charges	8827.2
	Water Charges	3678
	Packaging cost	250
	Loss in Processing	250
	Interest on working capital (49,412.2)12%	5929.46
	Total variable cost for 250 kg	55,341.66
	Variable cost per kg.	221.36

Total cost for processing

Total cost for processing was mentioned (Table 12).

Table 12. Total cost for processing

S.No	Cost	Total cost (Rs.)	Costperkg
1	Fixed cost	44,764.79	179.05
2	Variable cost	55,341.66	221.36
	Total cost	1,00,106	400.41

It was indicated that the total fixed cost of processing of dry onion flex was Rs. 44,764.79 and fixed cost per kg was Rs.179.05. Total Variable cost was Rs. 55,341.66 and Variable cost per kg was Rs. 221.36.

Income during the year 2021-22

Income during the year 2021-22 was given (Table 13). It was observed that company gets profit Rs 24,898 by sale of 250 kg of dry onion. Price per kg of dry onion was Rs.500 and cost of production was Rs. 400.41 hence total cost was also Rs 1,00,102 and total income was Rs 1,25,000. Similar findings were advocated by Muhammad et al. (2009).

Table 13. Income during the year

Product Name	Production (Kg)	Cost of Production (Rs./kg.)	Price Realized (Rs./kg)	Total cost (Rs.)	Total Income (Rs.)	Profit (Rs.)
Onion Flex	250	400.41	500	1,00,102	1,25,000	24,898

Benefit Cost Ratio of Onion Flex

BCR= Gross income/ Total cost of production

BCR= 1,25,000/ 1,00,102

BCR= 1.2

Here, it was compared the Present worth of Gross income with Present worth of Cost. BCR was more than one, i.e. 1.2 indicated, Project was satisfactory. B:C Ratio indicated, how much amount of money was received after investing Rs 1/-. For Natural agro project B:C Ratio was 1.2 means, when it was investing Rs 1/- then received Rs 1.2/-.

Total profit = Total Contribution- Total fixed cost
 $= 1,07,160 - 44,764.79$
 $= 62,395.21$

Thus, total profit of dry onion flex at Natural Agro Pune in year 2021-22 was ₹62,395.21.

*Actual sales = Quantity in kg * sales price*
 $= 250 \times 650$
 $= 1,62,500$

Thus, actual sales of dry onion flex at Natural Agro Pune in year 2021-22 was ₹1,62,500.

Margin of Safety = $\frac{\text{Actual Sales} - \text{BEP at Rs.}}{\text{Actual Sales}}$ × 100

$= \frac{(1,62,500 - 67,825.43)}{1,62,500} \times 100$
 $= 94,674.57 / 1,62,500 \times 100$
 $= 0.58 \times 100$
 $= 58\%$

Thus, Natural Agro Pvt Ltd, Pune have 58% Margin of safety for dry onion flex product. It indicated that actual profit of the company once it pays for all fixed and variable costs. Similar findings were observed by Sagar and Suresh (2010).

Conclusions

The total Procurement of Onion was 2,550 kg which cost Rs. 12,750 which was procured in the month of January, February and March (2021-22). B:C Ratio Onion Flex was 1.2, it indicates that the B:C ratio is more than so these product is profitable to run the processing unit.

BEP of Onion Flex indicates that the production of these products is much more than BEP point. The per kilogram processing cost of Onion flex was Rs 400.41. 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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