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Economic Performance and Management of Processed Products by Dehydration Process in Pune District of Maharashtra

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***Abstract*- 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. Also there are a lot of opportunities for value addition and employment generation in agribusiness sector.**

I. INTRODUCTION

Scope of study:

The biggest challenge for Indian agriculture is post harvest wastage. There are many reasons for this –. Some indicative figures are as follows,

1. Agro Durables – 5 -15%
2. Semi Perishables – 20-30%
3. Perishables – 30-50%

Minimal processing may occur in a "direct chain" of preparation and handling in which the product is processed, distributed, and then marketed or utilized. Many products are also handled in an "interrupted chain" in which the product may be stored before or after processing or may be processed to different degrees at different locations. Because of this variation in time and point of processing, it would be useful to be able to evaluate the quality of the raw material and predict the shelf life of the processed product. Water in any agro produce is the main cause affecting the shelf life. The major reasons behind the short shelf life of any agro produce are:

- Presence of high percentage of water/ high moisture content.
- Presence of enzymes, which are responsible for decomposition.

OBJECTIVES OF STUDY:

A. To study capital investment of the processing industry

B. To calculate the performance and feasibility

METHODOLOGY

In the recent years, Pune is a leading city for the dehydrated food consumption. The food industry of Pune city is highly growing and demanding new technology and substitute for daily vegetables. Primary data was collected by taking actual survey in or region for agricultural processing data were collected from various food processing industry in the Ambegoan area (Pune District).

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, Break-even point, Benefit cost ratio and payback period to work out the efficiency and feasibility of processing industries

RESULT AND DISCUSSION

1. Capital Investment of Processing Unit:

No	Particulars	Unit	Quantity	Total Area	Unit Cost	Total Cost (Rs)
A	Building structure					
1	Office	Sqft	1	400	600	240,000
2	Work Shade	Sqft	1	4500	500	2,250,000
3	Food Testing Lab	Sqft	1	200	600	120,000.00
B	Plant and Machinery					
4	Machinery And Equipments	-	-	-	-	3,782,500.00
C	Other Fixed Assets					
1	Electricity Connection	-	1	-	-	150,000.00
2	Office Furniture	-	1	-	-	500,000.00
3	FSMS Equipments	-	1	-		250,000.00
4	Other Fixed Assets	-	1	-	-	350,000.00
	TOTAL Capital Investment					7,642,500.00

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Vol 3, Issue 4, April 2018

II. COST OF PROCESSING

2.1 Total Fixed Cost

Table No.3.6Total Fixed Cost for Ginger Granules

Sr No	Particular	Amount
1	Depreciation	109,688
2	Land Rent	49,472
3	Interest on Fixed Cost	22,282
	Total	**181,442**

Table No 3.7 Total Fixed Cost for Mango Cheeks

Sr No	Particular	Amount
1	Depreciation	61,004
2	Land Rent	27,514
2	Interest on Fixed Capital	12,392
	Total	**100,910**

Table No. 3.8 Total Fixed Cost for Tomato Flakes

Sr No	Particular	Amount
1	Depreciation	58,657
2	Land Rent	26,456
2	Interest on Fixed Capital	11,916
	Total	**97,029**

Fixed Cost Per Kg

Fixed Cost per kg for Ginger Granules

=Total FixedCost / Total Quantity Processed
= 181,442 / 6311.2
= 28.75/ Kg

Fixed Cost per kg for Mango Cheeks

= Total Fixed Cost / Total Quantity Processed
= 100,910 / 3510
= 28.75/ Kg

Fixed Cost per kg for Tomato Flakes

= Total Fixed Cost / Total Quantity Processed
= 97,029 / 3375
= 28.75 / Kg

2.2 Total Variable Cost

Variable cost means the costs which are become recur during the year such as costs for inputs. In processing industry the Variable costs mainly including purchasing of Raw material, Payments of labours, loss during process, electricity charges, Sample checking charges, license renew charges, etc.

Table No.3.9Total Variable Cost For Selected Products according to % Share

Sr No	Particular	Total Amount (Rs)	Ginger Granules(Rs)	Mango Cheeks(Rs)	Tomato Flakes(Rs)
1	Raw Material	3151000	644,000	585000	225000
2	Labour	1,044,000	215,202	119686	115082
3	Water	187,200	38,588	21461	20635
4	Power	600,000	123,680	68785	66139
5	Administrative	24,000	4,947	2751	2646
6	FSMS	60,000	12,368	6878	6614
7	Packaging Cost	183,703.20	37,867	21060	20250
8	Advertising Cost	200,000	41,227	22928	22046
9	Maintenance	2,000	412	229	220
	Total Cost	**5451903.2**	**1,118,291**	**848779**	**478634**
	Interest on Variable Cost @ 10%	**545190.32**	**111,829**	**84878**	**47863**
	Grand Total	**5997093.52**	**1,230,120**	**933657**	**526497**

Variable Cost Per Kg

For Ginger Granules

= Total Variable Cost / Total Quantity Processed
= 1,230,120 / 6311.2
= 194.91/ Kg

For Mango Cheeks

= Total Variable Cost / Total Quantity Processed
=933657 / 3510
= 266 / Kg

For Tomato Flakes

= Total Variable Cost / Total Quantity Processed
=526497 / 3375
= 156 / Kg

Total Cost

Table No. Total Cost For Ginger Granules

Sr. No	Particular	Amount
A	Fixed Cost	28.75
B	Variable Cost	194.91
	Total Cost (Rs) { A+B}	**223.66**

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Vol 3, Issue 4, April 2018

Table No. Total Cost For Mango Cheeks

Sr. No	Particular	Amount
A	Fixed Cost	28.75
B	Variable Cost	266.0
	Total Cost (Rs) {A+B}	**294.75**

Table No. Total Cost For Tomato Flakes

Sr. No	Particular	Amount
A	Fixed Cost	28.75
B	Variable Cost	156.0
	Total Cost (Rs) {A+B}	**184.75**

3 Cash Flow Statements:

PARTICULAR	Y E A R S				
	I	II	III	IV	V
Initial Investment	3,293,964	-	-	-	-
Fixed Cost	535,058	535,058	535,058	535,058	535,058
Variable Cost	2,690,274	2,824,787	2,966,027	3,114,328	3,270,044
Gross Income	5,100,282	5,610,310	6,171,341	6,788,475	7,467,323
Total Cost	6,519,296	3,359,845	3,501,085	3,649,386	3,805,102
Net Income	1,419,014	2,250,465	2,670,257	3,139,089	3,662,220

4 Estimation of NPW

Table No.3.13Net Present Worth

Year	Total Cost	Gross Income	Net Income	DF 14%	Net Present Worth
1	6,519,296	5,100,282	-1,419,014	0.8772	-1,244,749
2	3,359,845	5,610,310	2,250,465	0.7695	1,731,660
3	3,501,085	6,171,341	2,670,257	0.6750	1,802,347
4	3,649,386	6,788,475	3,139,089	0.5921	1,858,593
5	3,805,102	7,467,323	3,662,220	0.5194	1,902,043
	Total		24046247		6,049,893

Interpretation- NPW is positive after 5 year so project is feasible.

5. Estimation of Benefit Cost Ratio (BCR):

Table No.3.14 : Estimation of BC Ratio

Year	Total Cost	Gross Income	Df 14%	Present Worth Of Cost	Present Worth Of Gross Income
1	6,519,296	5,100,282	0.877	5,717,422	4,472,947
2	3,359,845	5,610,310	0.796	2,674,437	4,465,807
3	3,501,085	6,171,341	0.675	2,363,232	4,165,655
4	3,649,386	6,788,475	0.593	2,164,086	4,025,566
5	3,805,102	7,467,323	0.519	1,974,848	3,875,541
	Total			14,894,026	21,005,516

$$\text{Benefit Cost Ratio} = \frac{\text{Present Worth of Gross Income}}{\text{Present Worth of Costs}}$$

= 21,005,516 / 14,894,026

= 1.41

Interpretation -Benefit Cost Ratio is Greater than 1 so that project is feasible.

Table No 3.13.1 B: C Ratio for Ginger Granules

Year	Total Cost	Gross Income	Df 14%	Present Worth Of Cost	Present Worth Of Gross Income
1	2,560,435	2,272,032	0.8772	2,245,996	1,993,011
2	1,473,068	2,499,235	0.7695	1,133,478	1,923,080
3	1,537,650	2,749,159	0.6750	1,037,870	1,855,604
4	1,605,460	3,024,075	0.5921	950,561	1,790,495
5	1,676,661	3,326,482	0.5194	870,805	1,727,671
	Total			6,238,710	9,289,860

BC Ratio = Present Worth of Gross Income / Present Worth of Cost

= 9,289,860 / 6,238,710

= 1.49

Table No. 3.13.2 B:C Ratio For Mango Cheeks

Year	Total Cost	Gross Income	Df 14%	Present Worth Of Cost	Present Worth Of Gross Income
1	2,008,611	1579500	0.8772	1,761,939	1,385,526
2	1,081,250	1,737,450	0.7695	831,986	1,336,911
3	1,130,267	1,911,195	0.6750	762,898	1,290,002
4	1,181,734	2,102,315	0.5921	699,682	1,244,739
5	1,235,776	2,312,546	0.5194	641,823	1,201,064
	Total			4,698,328	6,458,243

BC Ratio = Present Worth of Gross Income / Present Worth of Cost

= 6,458,243 / 4,698,328

= 1.37

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Vol 3, Issue 4, April 2018

Table No. 3.13.3 B:C Ratio For Tomato Flakes

Year	Total Cost	Gross Income	Df 14%	Present Worth Of Cost	Present Worth Of Gross Income
1	2,496,687	1,248,750	0.8772	2,190,077	1,095,395
2	649,851	1,373,625	0.7695	500,039	1,056,960
3	677,492	1,510,988	0.6750	457,288	1,019,874
4	706,515	1,662,086	0.5921	418,313	984,088
5	736,989	1,828,295	0.5194	382,769	949,559
	Total			3,948,486	5,105,876

BC Ratio = Present Worth of Gross Income / Present Worth of Cost

= 5,105,876 / 3,948,486

=1.29

Estimation of IRR:

Year	Total Cost	Gross Income	Net Income	Df Of 14%	NPW	Df Of 18%	NPW
1	6,519,296	5,100,282	1,419,014	0.8772	1,244,749	0.8475	1,202,554
2	3,359,845	5,610,310	2,250,465	0.7695	1,731,660	0.7182	1,616,249
3	3,501,085	6,171,341	2,670,257	0.6750	1,802,347	0.6086	1,625,201
4	3,649,386	6,788,475	3,139,089	0.5921	1,858,593	0.5158	1,619,107
5	3,805,102	7,467,323	3,662,220	0.5194	1,902,043	0.4371	1,600,790
	Total		24046247		6,049,893		5,258,793

IRR = Lower Discount Rate + {Difference between 2 Discount Rates X (Net Present worth at lower Discount rate)/ (Difference between 2 NPV)}

= 14 + {4 X (6,049,893 / [6,049,893 – 5,258,793])}

= 14 + {4X (6,049,893/ 7,91,100)}

= 44.59 %

Interperitation -IRR is greater than market interest rate (14%) so that project is feasible.

6. Estimation of Profitability Index:

$$\text{Profitability Index} = \frac{\text{Total NPW of Cash Flow}}{\text{Initial Investment}}$$

= 6,049,893 / 3,293,964

= 1.84

Interpretation –Profitability index is near to 1 that means project needs one more year to achieve profitability index. It will be feasible after a year.

7. Estimation of Payback Period:

Year	Total cost	Gross income	Net income
1	6,519,296	5,100,282	-1,419,014
2	3,359,845	5,610,310	2,250,465
3	3,501,085	6,171,341	2,670,257
4	3,649,386	6,788,475	3,139,089
5	3,805,102	7,467,323	3,662,220
	Total		24046247
	Average Net Income (Rs)		4,809,249

Payback Period = 3,293,964 / 4,809,249 + 1 Year

= 1.68

We can calculate in months and days,

Year = 1+1=2

In months = 0.6X 12 = 7.2

In days = 0.2 X 30 =6

Payback period = 2 years, 7 months, 6 days.

Interpretation: After 2 years 7 months and 6 days the project will cover the initial investment

8.Estimation of Break Even Point

BEP = Fixed Cost / (P-V)

Where, P = Price per Unit ,

V = Variable Cost per Unit

For Ginger Granules

Sr No	Particulars	Amount (Rs)
1	Total Fixed Cost	181442.47
2	Selling Price/Kg	360
3	Variable price/Kg	194.91
4	**Break Even In Units**	**1099.06**
5	**Break Even IN Rs**	**395660**

Margin Of Safety fo Ginger Granules

Sr No	Particular	Amount
1	Production (In Units)	6311.2
2	Break Even IN UNIts	1099.06
3	MOS	5212.14
	Margin Of Safety In Rs	
4	Production (In Rs)	2272032
5	**Break Even IN Rs**	**395660**
6	**MOS**	**1876372**

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Vol 3, Issue 4, April 2018

Interpretation: The fixed Assets utilization for Ginger granules processing is effective and Economical, Break even is nearly 17 % of present production capacity

For Mango Flakes

Sr No	Particular	Amount
1	Total Fixed Cost	100909.98
2	Selling Price/Kg	450
3	Variable price/Kg	266.00
4	**Break Even In Units**	**548.42**
5	**Break Even IN Rs**	**246789**

Sr No	Particular	Result
1	Production (In Units)	3510
2	Break Even In Units	548.42
3	**MOS**	**2961.58**
	Margin Of Safety In Rs	
4	Production (In Rs)	1579500
5	Break Even InRs	246789
6	**MOS**	**1332711**

Margin Of Safety For Mango Flakes

Interpretation:The fixed Assets utilization for Mango cheeks processing is effective and Economical, Break even is nearly 15% of present production capacity

For Tomato Flakes

Sr No	Particular	Amount
1	Total Fixed Cost	97028.82
2	Selling Price/Kg	450
3	Variable price/Kg	156.00
4	**Break Even In Units**	**330.03**
5	**Break Even IN Rs**	**562555**

Margin of Safety for Tomato Flakes

Sr No	Particular	Amount
1	Production (In Units)	3375
2	Break Even IN UNIts	330.03
3	MOS	3044.97
	Margin Of Safety In Rs	
4	Production (In Rs)	1248750
5	**Break Even IN Rs**	**562555**
6	**MOS**	**686195**

Interpretation: The fixed Assets utilization for Tomato granules processing is effective and Economical, Break even is nearly 10% of present production capacity.

III. CONCLUSIONS

As per analysis, Fruits and vegetable Dehydration unit Establishment is one of the highest profitable ventures in the food and agribusiness domain which provide sure income platform to Individuals, Entrepreneurs and corporate organizations throughout the supply chain of dehydrated product from farm to fork. After the detail study of the Prajakta technology Pvt Ltd (business)it is concluded that

i. The overall profitability position of fruits and vegetable dehydration unit is very good and shows better growth in his business.

ii. The success of any agri-business or business is depending on proper management of the business.

iii. NPW is positive hence, the project is feasible

iv. Internal Rate of Return is greater than the Market Interest Rate (14%), hence project is financially feasible and acceptable.

v. After 2 years, 7 months, 6 days project will cover the initial investment.

vi. BC Ratio is Greater than 1, hence Project is financially feasible.

vii. Profitability index is greater than 1 hence it is financially feasible.

viii. If PTPL management decided to focus on direct consumer market (B2C) then it will be most successful in dehydration business and they can get good response by consumer because of quality produce.

ix. Small dehydration units can be is an important source of income to Small and Marginal Farmers.

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