

**PROJECT PROFILE
ON DRIED
VEGETABLES UNIT**

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INTRODUCTION

India is the second largest vegetables producer in the world followed by China. The country grows around 15 per cent of the world's vegetables. Vegetables are seasonal and perishable in nature. Due to poor post-harvest management every year, around 30 percent of the vegetables are wasted in the whole supply chain. On the other hand, merely 2 per cent of the vegetables are processed in the country in to value added products and the rest is consumed as raw. To minimize the wastage in the supply chain vegetable processing is the need of the hour. The benefits of dehydrating food for preservation are twofold: by removing all of the food's moisture, you inhibit the growth of bacteria so the food stays preserved and safe much longer and you shrink the size of the food, making storage a snap. Processing of vegetables has huge scope in the country, it increases the self-life of the vegetables, generates more income for the farmers and increase employment in the country.

During off-season, the vegetables are available through processing of vegetables. Seasonal vegetables like carrots, okra, drum stick, bitter guard, green peas, cauliflower, cabbage, spinach, onion, sweet potato, mushroom, french bean etc. can be processed and well preserved. These vegetables can be made available at good prices during off season through proven dehydration technology. In this above backdrop, small to medium scale integrated vegetable processing unit for vegetables can be established in potential clusters across India.

PRODUCTS AND ITS APPLICATION

- 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.
- Dehydrated vegetables are used to manufacture instant vegetable noodles, soups, snacks and fast food.
- Dehydrated onion is used as condiment and flavouring agent in manufacturing of tomato ketchups, sauces, salad, pickles, chutneys, meat sausages, masala bread and buns, breakfast foods, etc.
- Dehydrated garlic is used for aids in digestion and for absorption of food having athelemetic and antiseptic properties and in some medicinal formulations.
- From the dried mushroom powder value added products like instant soup mix, bakery products, papad, nuggets etc. can be prepared. Processed extracts also use for Medicine.
- Processed vegetables are used as in ingredient in a number of dishes such as curries, sandwich, soup etc.
- The canned vegetables can be added to salads. The canned green peas and mushrooms can be used for various Indian recipes like mushroom matar (with peas).

DESIRED QUALIFICATION FOR PROMOTER

For processing of vegetables, require proper skills. In India, the traditional drying process involves sun drying; that leads to inferior product quality. Now modern techniques have been developed for dehydration of vegetables. In this process, the dehydrated product has better flavour, colour, aroma, rehydration, acceptability, etc. in comparison to sundried dehydrated products. Bhabha Atomic Research Centre has been developed the latest technology for dehydration. Now latest technology are available in the market and for dehydration process few institute like National Skill Development Corporation, Indian Institute of Horticulture Research, MSME ministries, etc. give training. They give training on mechanical drying through electricity/solar power. Below are some of the suggested training for the entrepreneur, however, these are not mandatory.

- Food standards for fruits and vegetables
- Methods of drying/dehydration of vegetables
- Handling, packaging and storage techniques
- Quality assessment of raw material, packaging materials and finished products
- Operation and maintenance of processing machineries and equipment
- Waste management
- GMP
- HACCP
- QMS
- Computer basics and ERP
- Training in Food Safety Standards and Regulations (as per FSSAI) (Mandatory)

INDUSTRY OUTLOOK/TREND

India is also a prominent exporter of Processed Vegetables to the world. The country has exported 4, 03,355.39 MT of Processed Vegetables to the world for the worth of Rs. 3718.65 Crores/ 501.65 USD Millions during the year 2020-21. Major Export Destinations are USA, UK, Germany, Thailand and Canada.

MARKET POTENTIAL AND MARKETING ISSUES, IF ANY

Due to the rise on Indian middle class the consumption of processed vegetables are rising. Indians are become more and more health conscious, therefore, demand for vegetables are rising throughout the year. Vegetables are mostly seasonal and perishable in nature and specific climatic conditions require for those vegetables. Again, there are huge price fluctuations between on and off-season of the vegetables. During on-season vegetable sold at a very low price, whereas in the off-season consumers have to pay accessibly high price. This fluctuation creates problem for both the producers and consumers. Therefore, vegetable preservation can play an important role in bringing

the demand and supply gap narrower.

BASIS AND PRESUMPTIONS

- i) This project is based on single shift basis and 300 working days in a year.
- ii) The average yield of dehydrated vegetables has been taken 13.4% based on fresh vegetables.
- iii) The cost of machinery and equipment/materials indicated refer to a particular make and the prices are approximate and those ruling at the time of the preparation of scheme.
- iv) Non-refundable deposits-project preparation cost, trial production, fees, etc., are considered under pre-operative expenses.

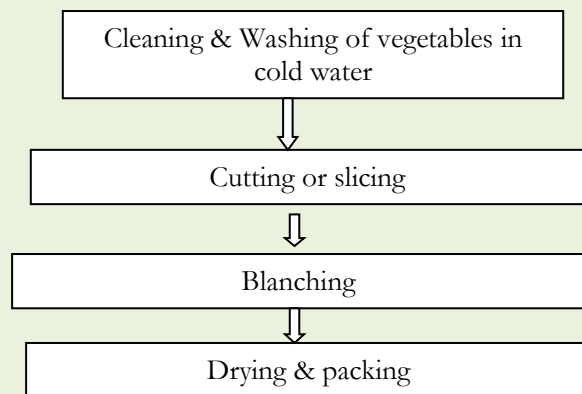
RAW MATERIAL REQUIREMENTS

Any raw vegetables like cabbage, green peas; besides chemicals are required.

Sl. No.	Particulars	Rate (MT) in INR	Quantity	Total (Rs. In Lakh)
1	Fresh vegetable like green peas, cabbage, carrots, ginger, potato, garlic, etc.)	15000	62.5	9.38
2	Chemicals Sodium sulphate, potassium metabisulphite, Aluminium silicate, Bleaching powder etc.	Lumpsum		0.50
3	Packing materials (polythene bags, corrugated boxes, straps, gum etc.)	Lumpsum		0.50
4	Wastage and cleaning materials	Lumpsum		0.30
	Total			10.68

MANUFACTURING PROCESS

Dehydration is one of the easiest processing and preservation techniques of agricultural commodities. Through this technique moisture is removed through heat. Traditional Indian drying process is sun drying. The outcomes of sun drying is not good. Therefore, mechanical drying through electricity/solar power offers better quality and price realization. Though different vegetables require different temperature; the optimum temperature is 140° F or 52° C as higher temperatures may 'case harden'. The product is usually dried up to 15 per cent moisture level. The general process flow chart for dehydrated fruits and vegetables is given below:



MANPOWER REQUIREMENT (PER MONTH)

Type	Number	Cost (Rs.)
Supervisor	1	20,000
Accountant	1	12,000
Food technologist/Chemist	1	20,000
Labour (skilled)	2	20,000
Labour (unskilled)	8	56,000
Helper cum sweeper cum choukidar	2	10,000
Total per month		1,38,000
Total per annum		16,56,000

LAND

Particulars	Units	Total Area	Rate per Sq. Mt. (INR)	Total Cost (INR Lakh)
Land (Own)	Sq. Mt.	1000	500	5.00
Built-up area (Production + Office + Store)	Sq. Mt.	400	3000	12.00

MACHINERY SPECIFICATIONS

Types of machinery	Quantity	Price (INR Lakh)
Washing machine rotary type equipped with jet spray arrangement. Size 9.3' × 3.3' × 6'. Electric power 1.5	1	2.50
Sulphitation chamber	1	3.00
Universal slicer for slicing of onion etc. capacity 1 Ton/Hr. Electric power 2 HP	1	2.50
Pea podder capacity- 250 kg/hr., Electric power 2 HP	1	3.00
Pea pricking machine Capacity 300 kg/hr., Electric power 1	1	2.00

Types of machinery	Quantity	Price (INR Lakh)
HP		
Potato/Carrot peeler capacity- 250 kg/hr., Electric power 2 HP Three side seal(vertical and horizontal)	1	2.00
Rotary dicer for slicing and dicing of root vegetable Capacity 1 Ton/hr., Electric Power 5 HP	1	2.00
Blanching tank with 6 Nos. S.S. perforated baskets with electric heating elements 5 K.W., Size 900×600×450 mm	1	3.00
Tray Drier capacity 96 Trays with extra 200 Nos. aluminium Trays and 4 No. Trolleys., Electric power 2 HP for fan heating Element 21 K.W.	1	3.50
Tray Drier capacity 48 Trays with extra 100 Nos. aluminium Trays and 2 No. Trolleys., Electric power 1 HP for fan heating Element 14 K.W.	1	2.00
Impulse heat sealer electric power 400 watts, @25,000 each	2	0.50
Preparation tables with aluminium top size 2350×860×860 mm, @25,000 each	4	1.00
Water storage tanks (Plastic)	1	0.50
Aluminium trays size 450×300×70mm	50	0.50
Misc. equipment like baskets, drums knives, peelers, mugs, weighing scales of different capacity etc.	Lumpsum	0.50
Laboratory equipment		0.50
Pollution control equipment water treatment tanks etc.		1.00
Total		30.00
Packaging, forwarding taxes, insurance charges etc. @ 10%		3.00
Erection and electrification @ 10%		3.00
Office furniture and fixtures		1.00
Total		37.00

Total cost of the above machineries come around 37 lakhs. In the process of dehydrated vegetables, the bottleneck operation is drying in a drier. Since dehydration process takes about 8-12 hours in various vegetables, for maximum utilization of drier, the process is divided into two batches; the first batch of prepared raw material is fed into bigger drier and transferred to a small drier after a few hours. Simultaneously, the 2nd batch is fed to a bigger drier and, once the first batch is out from the smaller drier, the 2nd batch is shifted to the second drier.

UTILITIES & CONTINGENCIES (per month)

Sl. No	Particulars	Cost (Rs. Lakh)
1	Electricity (Power Load-65 KW)	0.40
2	Contingencies	0.50
2.1	Postage and stationery	0.03
2.2	Advertisement & publicity	0.10
2.3	Repair & maintenance	0.03
2.4	Storage	0.10
2.5	Transportation	0.20
2.6	Insurance, taxes and telephone bills	0.02
2.7	Unforeseen expense	0.02

WORKING CAPITAL ASSESSMENT (per month)

Particulars	Value (in INR lakh)
Manpower	1.38
Electricity	0.40
Contingencies	0.50
Raw materials	10.68
Total Recurring expenditure per month	12.96
Total for 3 months	38.88

CAPITAL INVESTMENT

Sl. No	Particulars	Cost (Rs. Lakh)
1	Land	17.00
2	Plant & Machinery and Furniture	37.00
3	Preoperative Expenses	1.00
	Total Fixed Capital	55.00
4	Working Capital (for 3 months)	38.88
	Total	93.88 (rounding to 94 lakh)

IMPLEMENTATION SCHEDULE

Project Stages	Months.....						
	1	2	3	4	5	6	7
Acquisition of Land	Yellow	Yellow					
Ordering of Machinery	Green	Green					
Delivery of Machinery			Pink	Pink	Pink		
Term/Wkg Loan Sanction		Blue	Blue				
Installation of Machinery				Brown	Brown		
Commissioning of Plant						Red	
RM/Inputs Procurement						Purple	

Manpower Appointments							
Commercial Production							

PROFITABILITY CALCULATION

Sl. No	Particulars	Cost (Rs. Lakh)
A	Cost of Production (per year)	
A1	Total recurring expenditure	155.52
A2	Depreciation on buildings @ 5%	0.85
A3	Depreciation on machineries @ 5%	1.85
A4	Interest on capital investment @10%	9.38
	Total	167.60
B	Turnover (Total production 100MT @Rs.200 per kg)	200.00
C.	Net profit before tax	32.40
D	Net profit ratio Net profit (per year) × 100/Turnover per year	18%
E	Rate of return Net profit (per year) × 100/Total investment	34.51%

BREAK EVEN POINT ANALYSIS

Sl. No	Particulars	Cost (Rs. Lakh)
1	Depreciation on buildings @ 5%	0.85
2	Depreciation on machineries @ 5%	1.85
3	Interest on capital investment @10%	9.38
4	40% of salary and wages	6.62
5	40% of the utilities and contingent expense	4.32
6	Insurance	0.15
7	Total Fixed Cost	23.17
8	Net profit per year	32.40
9	BE Point: Net profit X100/Net Profit + Fixed Cost	58.30%

References

- TIMEIS Reports on Dried Vegetables
- Report on Dried Vegetables by Entrepreneur India
- NABARD Report on Dried Vegetables
- IIFPT Report on Dried Vegetables

Video Link – Dried Vegetables

<https://youtu.be/liIOvl9BRNQ>

MANUFACTURES/ SUPPLIERS OF MACHINERY

- M/s. Mather and Platt (India) Ltd. , 805-806, Ansal Bhawan, 16, Kasturba Gandhi Marg, New Delhi - 110 001.
- M/s. Raylons Metal Works, Kondivita Lane, Post Box - 17426, P.O. M.J.B. Nagar, Andheri (E), Mumbai - 400 059
- M/s. International Food Machinery Corporation, Krishna Opp. Deep Bhavan, Pandit Nehru Marg, Jamnagar - 361 008, (Gujarat)
- 4. M/s. The Master Mechanical Works Pvt. Ltd., 75, Link Road, 1st Floor, Adjacent to Moolchand Hospital, Lajpat Nagar - III, New Delhi - 110 024.
- 5. M/s. Narangs Corporation, P-25, Cannaught Place, (Below Madras Hotel), New Delhi - 110 001.
- 6. M/s. B. Sen Barry and Co., 65/11, Rohtak Road, Karol Bagh, New Delhi - 110 005

RAW MATERIAL SUPPLIERS

- M/s. Devendra Cottage Industries, Sector 22-C, Chandigarh.
- M/s. T. Ali Mohammed and Co., 144-45, Sarang Street, Near M.J. Phule Market, Mumbai - 400 003.
- M/s. S.B. Mehta and Associates, 2-B, Ganga Vihar, 94, Kanji Sayed Street, Mumbai - 400 003.
- M/s. Chemical Market, Tilak Bazar, Khari Baoli, Delhi - 110 006.

STATUTORY/ GOVERNMENT APPROVALS

There is statutory requirement of FSSAI license for setting up of food processing industry. Moreover, MSME & GST registration, IEC Code for Export of end products and local authority clearance may be required for Shops and Establishment, for Fire and Safety requirement and registration for ESI, PF and Labour laws may be required if applicable. Entrepreneur may contact State Pollution Control Board where ever it is applicable.

DISCLAIMER:

This is an indicative illustration of project profile; the above calculation can vary with the locations. Only few machine manufacturers are mentioned in the profile, although many machine manufacturers are available in the market. The addresses given for machinery manufacturers have been taken from reliable sources, to the best of knowledge and contacts. However, no responsibility is admitted, in

case any inadvertent error or incorrectness is noticed therein. Further, the same have been given by way of information only and do not carry any recommendation.

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