SPRAY DRIED FOOD: FRUIT & VEGETABLE, FAT POWDERS

1. INTRODUCTION:

India is the 2nd largest producer of vegetables in the world. Processing of fruits and vegetables in India becomes very important as major chunk of them gets exported to various countries. Drying of food is the one oldest technology to preserve them for longer period. Among various known methods, spray drying is one such method which is very useful and important because of its various applications.

2. PRODUCT & ITS APPLICATION:

Post-harvest, there used to be tremendous loss in preserving food. After converting food/vegetables into pulp, they are spray dried to convert them into powder. Spray drying helps maintain the real taste and flavor of the fruit and vegetable along with preventing its nutritive value.Fat powders are micro fine emulsified fats improving the sensory properties like creaminess, mouth feel and the appearance of the product in which added. Fat powders with different fat base & fat levels up to 80% can be achievable with spray drying machines and technology.

3. DESIRED QUALIFICATIONS FOR PROMOTER:

Successful running this project does not require any specific qualification.

4. INDUSTRY LOOKOUT AND TRENDS

Spray Dried Food Market size is foreseen to register a notable growth in the forecast time frame owing to rising demand for ready to eat edibles & snacks coupled with the convenience foods. Increasing demand for edible products with long shelf life along with

high demand of seasonal food products supports the spray dried food market in future.

Rising consumer awareness for health benefits from dietary consumption is likely to propel the product market growth. As edible products contain no moisture, helps to restrict the growth of micro-organisms in the products and keeping them fresh for long time. Expansion in snacks, confectionary and bakery industries is a major driving factor for spray dried food market growth, as manufacturers are focused on producing the healthier edibles owing to high demand for the product.

Shifting consumer eating preference couple with demographic & income trend are the key reasons which uplift the spray dried food market growth in predicted time frame. These products are produced by spray drying technique in which liquid products are converted into dry form by quick drying with the help of hot gases. Basically the usage of this technique is in dairy & coffee manufacturing sectors which help in retaining the taste &flavour of edible coupled with extended shelf life of the products. Most of the manufacturers implement this technique for producing instant edible. The products are less costly as compared to freeze dried edibles is another reason for product market growth in upcoming years.

Increasing demand for dairy products include cream, cheese, powder milk and mava for several health benefits is expected to propel the spray dried food market demand in forecast period. Ease of storage, light weight and high nutritional value are the key factors are anticipated to fuel the spray dried food market demand. The aroma and colour of these products did not change and helps in order to maintain the texture of edibles. Based on product, spray dried food market is segregated which includes fruits, spices, seafood's, seasonings, dairy products and seafood. High usage of the products in several areas includes bakery & confectionary, snacks, soup mixes and infant formulas.

5. MARKET POTENTIAL AND MARKETING ISSUES, IF ANY:

Spray Dried food products are widely used in various food industries. They use these for ingredients in their final food products. Various seasoning products are cheese powder, tamarind powder, tomato powder, lime etc. Fruit powders like apple, amla, banana, papaya

etc. are heavily used in health drinks, nutraceuticals products, ayurvedic products, baby food. Natural fruit powder such as lime, mango, orange, pineapple etc.are used in instant beverage mix, milkshakes, and ice-cream premix.

6. RAW MATERIAL REQUIREMENTS:

Raw materials required here are various vegetables and fruits such as, orange, lime, apple, banana, pineapple, tomato, cheese, tamarind etc. To pack dried powders, packing materials of food grade is required and to pack them in bunch, cardboard boxes are required.

7. MANUFACTURING PROCESS:

The manufacturing process steps comprise:

(a) Pretreating fruits for 3 minutes in Hot water 60 °C & blanching.

(b) Collecting fruit pulp & filtering.

(c) Addition of water soluble drying aid

(d) Controlled flow of juice in to the atomizer

(e) Controlled inlet and outlet air temperature of the spray dryer.

(f) Collection of powder from the cyclone and bottom outlet

8. MANPOWER REQUIREMENT:

The enterprise requires 8employees as detailed below**:**

Sr. No.	Designation of Employees	Salary Per Person	Monthly Salary ₹	Number of employees required				
				Year-1	Year-2	Year-3	Year-4	Year-5
	Variable Labour: Workers							
1	Operator	₹ 10,000.00	₹ 10,000.00	1	1	1	2	2
2	Un Skilled Workers	₹ 8,000.00	₹ 24,000.00	3	3	3	5	5
	sub-total		₹ 34,000.00	4	4	4	7	7
	Fixed Staff:							
1	Accountant	₹ 12,000.00	₹ 12,000.00	1	1	1	1	1
2	Store Keeper	₹ 8,000.00	₹ 8,000.00	1	1	1	1	1
3	Sales Staff	₹ 12,000.00	₹ 24,000.00	2	2	2	3	3
	sub-total		₹ 44,000.00	4	4	4	5	5
	Total		₹ 78,000.00	8	8	8	12	12

9. IMPLEMENTATION SCHEDULE:

The project can be implemented in 7months' time as detailed below:

Sr. No.	Activity	Time Required *(in months)*
1	Acquisition of premises	1.00
2	Construction (if applicable)	2.00
3	Procurement & installation of Plant & Machinery	2.00
4	Arrangement of Finance	1.00
5	Recruitment of required manpower	1.00
	Total time required *(some activities shall run concurrently)*	7.00

10. COST OF PROJECT:

The project shall cost ₹ 44.30 lacs as detailed below:

Sr. No.	Particulars	₹ in Lacs
1	Land	3.00
2	Building	2.50
3	Plant & Machinery	13.68
4	Furniture, other Misc. Equipments	0.50
5	Other Assets including Preliminary / Pre-operative expenses	1.37
6	Margin for Working Capital	23.25
	Total	**44.30**

11. MEANS OF FINANCE:

Bank term loans are assumed @ 75% of project cost. The proposed funding pattern is as under:

Sr. No.	Particulars	₹ in Lacs
1	Promoter's contribution	11.07
2	Bank Finance	33.22
	Total	**44.30**

12. WORKING CAPITAL CALCULATION:

The project requires working capital of ₹23.25lacs as detailed below:

Sr. No.	Particulars	Gross Amt	Margin %	Margin Amt	Bank Finance
1	Inventories	11.63	0.25	2.91	8.72
2	Receivables	5.81	0.25	1.45	4.36
3	Overheads	5.81	100%	5.81	0.00
4	Creditors	-		0.00	0.00
	Total	23.25		10.17	13.08

13. LIST OF MACHINERY REQUIRED:

A detail of important machinery is given below:

Sr. No.	Particulars	UOM	Qtty	Rate (₹ in Lacs)	Value (₹ in Lacs)
	Plant & Machinery / equipments				
a)	***Main Machinery***				
1	Washer	Nos	1	₹ 0.18	₹ 0.18
2	Pulper/Fruit Extractor	Nos	1	₹ 0.45	₹ 0.45
3	Spray Dryer	Nos	1	₹ 12.00	₹ 12.00
4	Packing Machine	Nos	1	₹ 0.70	₹ 0.70
5	Weighing Scale	Nos	1	₹ 0.20	₹ 0.20
6	Misc. Tools	LS		₹ 0.15	₹ 0.15
	sub-total Plant & Machinery				**₹ 13.68**
	Furniture / Electrical installations				
1	Office furniture and Electrification	LS	1	₹ 0.50	₹ 0.50
	sub total				**₹ 0.50**
	Other Assets				
1	preliminary and preoperative	LS		1.37	₹ 1.37
	sub-total Other Assets				**₹ 1.37**
	Total				**₹ 15.55**

All the machines and equipments are available from local manufacturers. The entrepreneur needs to ensure proper selection of product mix and proper type of machines and tooling to have modern and flexible designs. It may be worthwhile to look at reconditioned imported machines, dies and tooling. Some of the machinery and dies and tooling suppliers are listed here below:

1. Fry-Tech Food Equipments Private Limited
   S. No. 4, Ravi raj Industrial Estate,
   Bhikhubhai Mukhi Ka Kuwa Bharwadvash,

Ramol, Ahmedabad - 380024,
Gujarat, India

2. Hindustan Vibrotech Pvt. Ltd.
Office No. 2, Ground Floor,
Vrindavan Building, Vile Parle East,
Mumbai – 400057,
Maharashtra, India

3. Electrons cooling systems Pvt. Ltd.
S-27, SIDCO Industrial Estate
Kakkalur Industrial Estate
Tiruvallur – 602003,
Tamil Nadu, India

4. Springboard Enterprises India Ltd.
1st, 2nd & 3rd Floor,
Plot No. 7, 8 & 9,
Garg Shopping Mall,
Service Centre, Rohini Sector 2
New Delhi – 110085

5. Flour Tech Engineers Private Limited
Plot No. 182, Sector 24,
Faridabad - 121005,
Haryana, India

6. P Square Technologies
3, Swami Mahal,
Gurunanak Nagar,
Off. Shankarsheth Road Bhavani Peth,
Pune - 411002,

Maharashtra, India

7. Ricon Engineers
   10 To 13, Bhagwati Estate,
   Near Amraiwadi Torrent Power,
   Behind Uttam Dairy,
   Rakhial, Ahmedabad - 380023,
   Gujarat, India

8. Kamdhenu Agro Machinery
   Plot No. 6, Near Power House,
   Wathoda Road Wathoda,
   Nagpur - 440035,
   Maharashtra, India

14. PROFITABILITY CALCULATIONS:

Sr. No.	Particulars	UOM	Year-1	Year-2	Year-3	Year-4	Year-5
1	Capacity Utilization	%	60%	70%	80%	90%	100%
2	Sales	₹. In Lacs	86.40	100.80	115.20	129.60	144.00
3	Raw Materials & Other direct inputs	₹. In Lacs	60.83	70.97	81.10	91.24	101.38
4	Gross Margin	₹. In Lacs	25.57	29.83	34.10	38.36	42.62
5	Overheads except interest	₹. In Lacs	11.49	12.21	13.64	14.07	14.36
6	Interest @ 10 %	₹. In Lacs	3.32	3.32	2.21	1.66	1.33
7	Depreciation @ 30 %	₹. In Lacs	9.58	6.84	4.79	3.42	3.08
8	**Net Profit before tax**	₹. In Lacs	**1.19**	**7.47**	**13.45**	**19.20**	**23.85**

The basis of profitability calculation:

This unit will have Processing capacity of 400 Kg per day, Efficiency 70-80%, Annual Turnover 90 MT. The growth of selling capacity will be increased 10% per year. (This is assumed by various analysis and study; it can be increased according to the selling strategy.)

Energy Costs are considered at Rs 7 per Kwh and fuel cost is considered at Rs. 65 per liter. The depreciation of plant is taken at 10-12 % and Interest costs are taken at 14 -15 % depending on type of industry.

15. BREAKEVEN ANALYSIS:

The project shall reach cash break-even at 36.81% of projected capacity as detailed below:

Sr. No.	Particulars	UOM	Value
1	Sales at full capacity	₹. In Lacs	144.00
2	Variable costs	₹. In Lacs	101.38
3	Fixed costs incl. interest	₹. In Lacs	15.69
4	BEP = FC/(SR-VC) x 100 =	% of capacity	36.81%

16. STATUTORY / GOVERNMENT APPROVALS

The Ministry of Food Processing Industries has been operating several plan schemes for the development of processed food sector in the country during the 10th Plan. One of the schemes relates to the Technology Up-gradation/ Establishment/ Modernization of food processing industries.

The Indian food processing industry is regulated by several laws which govern the aspects of sanitation, licensing and other necessary permits that are required to start up and run a food business. The legislation that dealt with food safety in India was the Prevention of Food Adulteration Act, 1954 (hereinafter referred to as "**PFA**"). The PFA had been in place for

over five decades and there was a need for change due to varied reasons which include the changing requirements of our food industry. The act brought into force in place of the PFA is the Food Safety and Standards Act, 2006 (hereinafter referred to as "**FSSA**") that overrides all other food related laws.

FSSA initiates harmonization of India's food regulations as per international standards. It establishes a new national regulatory body, the Food Safety and Standards Authority of India (hereinafter referred to as "**FSSAI**"), to develop science based standards for food and to regulate and monitor the manufacture, processing, storage, distribution, sale and import of food so as to ensure the availability of safe and wholesome food for human consumption. Entrepreneur may contact State Pollution Control Board where ever it is applicable.

All food imports will therefore be subject to the provisions of the FSSA and rules and regulations which as notified by the Government on 5th of August 2011 will be applicable.

Key Regulations of FSSA

A. Packaging and Labeling
B. Signage and Customer Notices
C. Licensing Registration and Health and Sanitary Permits

17. BACKWARD AND FORWARD INTEGRATIONS

The objective of the scheme is to provide effective and seamless backward and forward integration for processed food industry by plugging the gaps in supply chain in terms of availability of raw material and linkages with the market. Under the scheme, financial assistance is provided for setting up of primary processing centres/ collection centres at farm gate and modern retail outlets at the front end along with connectivity through insulated/ refrigerated transport.

The Scheme is applicable to perishable horticulture and non-horticulture produce such as, fruits, vegetables, dairy products, meat, poultry, fish, Ready to Cook Food Products, Honey, Coconut, Spices, Mushroom, Retails Shops for Perishable Food Products etc. The Scheme

would enable linking of farmers to processors and the market for ensuring remunerative prices for agri produce.

The scheme is implemented by agencies/ organizations such as Govt. / PSUs/ Joint Ventures/ NGOs/ Cooperatives/ SHGs / FPOs / Private Sector / individuals etc.

Backward Linkage:

- Integrated Pack-house(s) (with mechanized sorting & grading line/ packing line/ waxing line/ staging cold rooms/cold storage, etc.)
- Pre Cooling Unit(s)/ Chillers
- Reefer boats
- Machinery & equipment for minimal processing and/or value addition such as cutting, dicing, slicing, pickling, drying, pulping, canning, waxing, etc.
- Machinery & equipment for packing/ packaging.

Forward Linkage:

- Retail chain of outlets including facilities such as frozen storage/ deep freezers/ refrigerated display cabinets/cold room/ chillers/ packing/ packaging, etc.
- Distribution center associated with the retail chain of outlets with facilities like cold room/ cold storage/ ripening chamber.

18. TRAINING CENTERS AND COURSES

There are few specialized Institutes provide degree certification in Food Technology, few most famous and authenticate Institutions are as follows:

1. Indian Institute of Food Science & Technology,
   Plot No.1, Near Maa-Baap ki Dargah,Opp to Nath Seeds,
   Paithan Road Aurangabad
   Aurangabad - 431005
   Maharashtra, India

2. MIT College of Food Technology, Pune
   Gate.No.140, Raj Baugh Educational Complex,
   Pune Solapur Highway,
   Loni Kalbhor, Pune – 412201
   Maharashtra, India

3. CSIR - Central Food Technological Research Institute (CFTRI)
   Cheluvamba Mansion, Opp. Railway Museum,
   Devaraja Mohalla, CFTRI Campus, Kajjihundi, Mysuru
   Karnataka – 570020

Udyamimitraportal (link : www.udyamimitra.in) can also be accessed for handholding services viz. application filling / project report preparation, EDP, financial Training, Skill Development, mentoring etc.

Entrepreneurship program helps to run business successfully is also available from Institutes like Entrepreneurship Development Institute of India (EDII) and its affiliates all over India.

Disclaimer:

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.