ICE CREAM PLANT (BATCH TYPE)

1. INTRODUCTION:

Ice Cream is a popular food product. It was considered as a luxury food for summer season only. However, with the development of Dairy and Milk processing industry it has also found use as a Dessert. The Bureau of Indian Standards have formulated IS2802:1964 for preformed Ice Cream and IS5839:1970 for hygienic conditions for manufacture, storage and sale of Preformed Ice Cream. Average Ice Cream and Premium Ice Cream differ in solid content as below:

No.	Ingredient	Contentaspercentin	
		AverageIceCream	**Premium IceCream**
1.	Milk Fat	10.5%	16.0%
2.	NonFat Milk solids	11.0%	9,0%
3.	Sucrose	12.5%	16.0%
4.	Corn syrup	5.5%	-
5.	Stabilizers	0.3%	0.1%
6.	Emulsifier	0.1%	-
	Total solids	**39.9%**	**41.1**

One hundred grams of Ice Cream contain more than 200 calories and 4%protein, besides Minerals and Vitamins.

2. PRODUCT & ITS APPLICATION:

The ice cream makes easy and quick to serve like popcorns, in preformed paper or thermocol disposable cups or plastic containers, to maximize its sales at site like shopping malls, amusement parks, airports and railway stations etc. It also make it much cleaner than "ordinary" ice cream, especially with young kids, as unlike regular ice creams, it can be eaten using ordinary spoons easily, without creating a mess. Ice creams are popular and

commonly available in the form of cups, bars and candies.

3. DESIRED QUALIFICATIONS FOR PROMOTER:

Do not require any specific qualification.

4. INDUSTRY LOOKOUT AND TRENDS

Ice cream market in the following regions – Asia Pacific, North America, Europe, Latin America and Middle East & Africa. According to the report, Asia is currently the biggest market of ice cream followed by North America, Europe, Latin America and Middle East & Africa. For each of the regions, this report provides both historical (2009-2016) and future (2017-2022) trends in the ice cream market. Other important market engineering aspects such as the competitive landscape, margin analysis, import and export, porters five forces analysis, value chain analysis, etc. have also been thoroughly evaluated in this report.

The report also provides a detailed technical insight on setting up and operating an ice cream manufacturing plant. This includes the manufacturing process, machinery requirements, land requirements, labour requirements, packaging requirements, transportation requirements, power requirements, incomes, expenditures, profit margins, NPV, IRR, etc. In order to provide a clearer picture, the report has also presented this information in the form of a dynamic excel model where users can analyze the entire information and also change various inputs according to their requirements.

5. MARKET POTENTIAL AND MARKETING ISSUES, IF ANY:

Ice Cream is consumed as Dessert as well as any time snacks. Its demand peak in Summer months. Railways are the most important bulk consumer of Ice Cream. Hotels, Restaurants, Resorts and flight kitchens are other bulk consumers. Sales through vendors and shops attract other consumers the most. Street vendors find good market for Ice Creams among school children.

Increase in population, fast changing lifestyle increasing percentage of youths in population in north eastern states will result a satisfactory growth in current market. Ice cream finds round the year market and is consumed in all class of people as readily available hygienic food for all ages. Ice cream is consumed more in cities. However, particularly in marriages, meetings and social gatherings, it is being used even in villages and towns. The consumption of ice cream is likely to increase in future. There is good scope for any new entrepreneur to venture in this field.

6. RAW MATERIAL REQUIREMENTS:

The Unit shall need the following raw-materials per annum at the installed capacity:

No.	Raw/Packing Materials	Quantity
1.	Milk	54000Liters
2.	Cream	6,300 Kilograms
3.	Butter	2,200 Kilograms
4.	Sugar	10,900Kilograms
5.	Stabilizers & Emulsifiers & flavor	3,225Kilograms
6.	Corn syrup	4,200 Kilograms
7.	Printed Ice Cream cups	7,50,000No's
8.	Ice cream sticks	7,50,000No's
9.	Printed paper cover	7,50,000No's
		Total

Packing materials shall be stored for 3months. Milk shall be stored for one day only. Other raw-materials shall be stored for a week.

7. MANUFACTURING PROCESS:

The process suggested here is the one tested and practiced all over India. Milk shall be pasteurized in Steam-Jacketed SS Vessel. Milk, Cream, Butter and Sugar in exact quantities shall be mixed in a SS Homogenizer. The Mix shall be pasteurized again. Emulsifiers and Stabilizers shall be added to the mix and blended. This mix is further homogenized so that the globule sizes are 4 microns or less. The mixture is cooled again and kept cool for at

least 24hours at4·C to 0·C. Flavors and colors are added prior to cooling. The mixture is cooled again below 0·C for hardening in a Batch Freezer. Ice Cream is packed in small cups and as cones with Wooden/Bamboo handles. For cups and cubes the above process suffices. For cones the Ice Cream is placed inside moulds with the handle for deep freezing. Such cones are packed in Plastic/Paper packets. Ice Cream in Cups and Cones shall be vended in Cooled Hand Carts by authorized vendors. Vendors are given 35% of sales realization as Commission and they work for the Commission only. Basic steps in the manufacturing of ice cream are generally as follows:

- Blending of the mix ingredients
- Pasteurization
- Homogenization
- Agingthemix
- Freezing
- Packaging
- Hardening

8. MANPOWER REQUIREMENT:

The enterprise requires 15 employees 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
1	Un-Skilled Workers	8,000	56,000	7	7	7	7	7
2	Accountant	8,000	8,000	1	1	1	1	1
3	Store Keeper	6,000	6,000	1	1	1	1	1
4	Production Supervisor	9,000	9,000	1	1	1	1	1
5	Security Personnel	6,500	6,500	1	1	1	1	1
6	Manager	20,000	20,000	1	1	1	1	1
7	Skilled Labour	10,000	30,000	3	3	3	3	3
	Total		135,500	15	15	15	15	15

9. IMPLEMENTATION SCHEDULE:

The project can be implemented in 13 months' time as detailed below:

Sr. No.	Activity	Time Required *(in months)*
1	Acquisition of premises	3.00
2	Construction (if applicable)	5.00
3	Procurement & installation of Plant & Machinery	2.00
4	Arrangement of Finance	2.00
5	Recruitment of required manpower	1.00
	Total time required *(some activities shall run concurrently)*	13.00

10. COST OF PROJECT:

The project shall cost INR 31.26 lacs as detailed below:

Sr. No.	Particulars	INR in Lacs
1	Land	7.50
2	Building	3.20
3	Plant & Machinery	6.88
4	Furniture, Electrical Installations	1.00
5	Other Assets including Preliminary / Pre-operative expenses	0.69
6	Margin for Working Capital	12.00
	Total	**31.26**

11. MEANS OF FINANCE:

Bank term loans are assumed @ 60% of fixed assets. The proposed funding pattern is as under:

Sr. No.	Particulars	INR in Lacs
1	Promoter's contribution	7.81
2	Bank Finance	23.44
	Total	**31.26**

12. WORKING CAPITAL CALCULATION:

The project requires working capital of INR 12lacs as detailed below:

Sr. No.	Particulars	Gross Amt	Margin %	Margin Amt	Bank Finance
1	Inventories	6.00	0.25	1.50	4.50
2	Receivables	3.00	0.25	0.75	2.25
3	Overheads	3.00	100%	3.00	0.00
4	Creditors	-		0.00	0.00
	Total	12.00		5.25	6.75

13. LIST OF MACHINERY REQUIRED:

A detail of important machinery is given below:

Sr. No.	Particulars	UOM	Qtty	Rate (INR)	Value (INR in lacs)
1	(a) 2 No's of 300 Ltr. Capacity SS Milk Storage Tanks (b) One 400 Ltrs capacity SS steam Jacketed Pan (c) One ss steam Jacketted Pasteuriser of 320 Ltrs. Capacity with 6 HP Motor for Agitator (d) One SS Two stage Homogeniser of 350 Liter capacity with water cooling system operating at 300 PSI with 4.5 H.P. Motor, pressure gauge etc. (e) One SS Surface Cooler (4.4°C to 0°C) in two sections: water cooled and gas cooled. (f) One SS Agency vat/storage Tank of 300 Liters capacity with copper coil of 50 ft. length (g) One 35 Liter capacity Batch freezer with 9.0 TR and 6HP Compressor (h) One Deep Freeze (i) One volumetric filling machine (j) One Baby Boiler (Non-IBR)	NOS.	1	INR 644,400.00	6.44
2	Freight, Packing & forwarding, CST, local handling, etc. costs of above machinery			INR 43,200.00	0.43

	sub-total Plant & Machinery				**6.88**
	Furniture / Electrical installations				
a)	Office furniture	LS	1	50000	0.50
b)	Stores Almirah	LS	1	0	0.00
c)	Computer & Printer	L. S.	1	50000	0.50
	sub total				**1.00**
	Other Assets				
a)	preliminary and preoperative				0.69
	sub-total Other Assets				0.69
	Total				**8.56**

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, Raviraj 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	INR In Lacs	67.50	78.75	90.00	101.25	112.50
3	Raw Materials & Other direct inputs	INR In Lacs	34.47	40.22	45.96	51.71	57.45
4	Gross Margin	INR In Lacs	33.03	38.53	44.04	49.54	55.05
5	Overheads except interest	INR In Lacs	15.36	16.32	18.24	18.82	19.20
6	Interest @ 10 %	INR In Lacs	2.34	2.34	1.56	1.17	0.94
7	Depreciation @ 30 %	INR In Lacs	4.81	3.44	2.41	1.72	1.55
8	**Net Profit before tax**	INR In Lacs	**10.51**	**16.43**	**21.83**	**27.83**	**33.36**

The basis of profitability calculation:

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 litre. 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 36.59% of projected capacity as detailed below:

Sr. No.	Particulars	UOM	Value
1	Sales at full capacity	₹. In Lacs	112.50
2	Variable costs	₹. In Lacs	57.45
3	Fixed costs incl. interest	₹. In Lacs	20.14
4	BEP = FC/(SR-VC) x 100 =	% of capacity	36.59%

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 Labelling
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 centre associated with the retail chain of outlets with facilities like cold room/ cold storage/ ripening chamber.

18. TRAINING CENTERS AND COURSES

There are few specialised 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.