

DE-HULLED SESAME SEEDS

1. INTRODUCTION:

Sesame seeds comprise a crazy taste and a fragile, about imperceptible, chew to many Asian plates. They are as well the major ingredients in sesame seed paste and the magnificent Middle Eastern sweet call halvah. Sesame seeds can be available all through the year. Sesame seeds are an excellent resource of: Best source of copper, Resource of manganese, it is also rich in magnesium, calcium, phosphorus, iron, zinc, molybdenum, as well selenium. India produces a wide range of sesame varieties with different grades each peculiar to the region. Sesame is harvested twice a year and is available around the year.

2. PRODUCT & ITS APPLICATION:

Sesame has been classified in different colors as below: White seed Yellow seed Red seed Brown seed Black seed

Uses of sesame in various forms Seeds: Sesame seeds are used in various food and snack preparations as well as in, salad dressing. Sesame is used mainly as a food ingredient in whole, broken, crushed, shelled, powdered and paste forms. Oil: Sesame seeds contain the highest oil compared to any other oilseed to an extent of 50% and above. The unique qualities of sesame oil are stability and resistance to rancidity, with long shelf life due to the presence of the high level of natural antioxidants. Other than for cooking and salad dressing, the oil is an essential ingredient in manufacture of soaps, pharmaceuticals (as healing oil) and lubricants with additional use in cosmetic and skin care industries. Meal: Sesame seeds are rich in protein with about 25% of their weight. Sesame meal contains 35 - 50% protein and used as feed for poultry and livestock.

Sesame seed cleaning and sorting Sesame seed soaking in water tanks Sesame seed dry roasting Roasted sesame seed Crushing in expellers Filtration of roasted sesame oil

Packing of oil in tins/bottles Packing in cartons for export Sesame seed aqua de-hulling
Separation of hulls by centrifuging Drying of de - hulled sesame seed Packing in multi -
wall laminated paper bags

3. DESIRED QUALIFICATIONS FOR PROMOTER:

Successful running this project does not require any specific qualification.

4. INDUSTRY LOOKOUT AND TREND

2016 Global Sesame Seeds Production, Supply, Sales, and Demand Market Research Report are a professional and in-depth research report on Sesame Seeds. From two aspects: production and sales, the report provides detailed information of production, supply, sales, demand, price, cost, income and revenue on Sesame Seeds in US, EU, China, Japan and rest of the world.

In terms of production, the report gives ex-factory price, cost, production value and gross margin etc. of different types of Sesame Seeds produced in different regions and different manufacturers.

In terms of sales, the report gives sales volume, sales price, cost, sales income, and profit margin etc. of Sesame Seeds used in different fields, sold in different regions and by different companies.

The past price of 2013-2016 and future price of 2016-2021 are analysed according to the supply-demand relation, as well as perspectives and forecasts.

Besides production and sales data, the report provides data on deals (distributors) and Buyer s, giving readers an insight into the supply chain and sales details of Sesame Seeds

The import, export, stock size and relevant data of Major GDP regions such as EU, US, Japan and China are listed in the report. As a global report, in addition to above-mentioned Major GDP regions, we provide breakdown data of Germany, UK, and France of the EU, and data of other countries such as India, South Korea, Brazil and Australia.

5. MARKET POTENTIAL AND MARKETING ISSUES, IF ANY:

Sesame is cultivated over an area of about 74 lakh hectares in the world with an annual production of about 40 lakh tonnes and yield of 535 kg/hectares. Myanmar and India are the major sesame growing countries, accounting for almost 40% of the global sesame production. India accounts for over one - fourth of land area under sesame cultivation in the world. Among oilseeds, sesame occupies 2nd position after groundnut as far as exports of oilseeds are concerned. More than 40% of the sesame seeds produced in India is exported every year. India is the largest exporter of sesame seeds in the world, contributing nearly 25% to international trade. Vietnam is the primary destination for Indian sesame seed, followed by South Korea, USA, Taiwan and China. For the period Jan'14 – July'16, Mundra accounted for 53.3% of exports followed by Nhava Sheva Sea and Pipavav (Victor) Port which account for 18.7% and 15.9% of exports respectively. India is the largest exporter of sesame seeds in the world, contributing nearly 25% to international trade. More than 85% production of Sesame comes from West Bengal, Madhya Pradesh, Rajasthan, Uttar Pradesh, Gujarat and Andhra Pradesh. Gujarat ranks amongst the top sesame producing states in the country (2013/14). 4th in terms of area under production and yield 2nd in terms of production.

6. RAW MATERIAL REQUIREMENTS:

Of the average (2009/10–2013/14) area under production for oilseeds in India (about 270 lakh hectares), Sesame ranks fourth with about 19 lakh hectares, this is about 7% of the total. So availability of sesame is very ease.

7. MANUFACTURING PROCESS:

Sesame seeds have a thin shell or husk which needs to be removed and this process is known as dehulling. The weight of hull is about 17% of total weight of sesame seed. The hull contains a great deal of oxalic acid and in-digestive fibre. Oxalic acid can reduce biological utilization ratio of Ca in Food and influence taste. After dehulling, oxalic acid can reduce from 3% to 0.25% in sesame seeds, which improve the protein digestibility greatly. So, dehulling of sesame seeds is the precondition of enlarging application of sesame in food field. Hulled sesame seeds are softer and tastier than unhulled seeds. Sesame seeds are also an excellent source of unsaturated fatty acids and phytosterols. Wet Dehulling Process is compared with dry dehulling process. Dry dehulling process is that dry the sesame seeds after cleaning at a certain level, which can dehydrate the moisture in hull quickly and be brittle. Then use clash dehulling method, the hulls are peeled from sesame seeds. The dry process is short in technology line, few investment in equipments but low at dehulling rate, easily get yellow or brown even burnt at high temperature. So, for commodity use, dry method is not commonly used in processing sesame seeds, generally, only for little quantity self-use in some foodstuff factories.

A wet dehulling process has been developed for easy removal of the husk from the sesame seed. The process of dehulling consists of preliminary cleaning and grinding, hot lye treatment, removal of the skin and pigments, thorough washing and drying. The de hulled seed is expelled to get high grade oil. The cake is further expelled to recover the residual oil and protein-rich meal. The protein-rich sesame cake flour finds multiple uses in protein fortification of food preparations. The de-hulled sesame seeds and flour offer good potential for both domestic and export markets. A process has also been developed for washing of white sesame seeds to produce confectionery grade product. Brilliant white seeds are produced, which is known as hulled sesame seeds.

Process Flow of Complete Sesame hulling Plant

Soaking : The purpose of soaking is that make hull of sesame seeds sopped up water to expand for peeling off from seeds. The project use lye, soaking raw sesame seeds in a certain temperature, which improve the speed of infiltration ratio of water into hull, shorten the soaking time greatly to 30-40 minutes from original 7-8 hours. The produce periods is shortened. At the same time, lye weakens pigments in hull for the whiteness of sesame seeds.

Dehulling : The project use vertical huller to make sesame seeds in relative movement. By soft friction between sesame seeds, the hull is removed.

Separating : It is the key process in sesame seeds production, affecting final yield of finished product. Generally, put the mixture of hulls and seeds into water tank, by different buoyancy of hulls and seeds, fish out the hulls by hand. But it is not thorough method by buoyancy. So the project uses separation theory by different geometrical sizes of hulls and seeds. Namely, use best soaking technology to soften hulls, increase crush rate of hulls but do not influence intact rate of seeds when hulling, then use hulls smaller than seeds, taking away the hulls with water flow in subsidence-type automatic separator. The seeds are captured. The separation of hulls and seeds succeeded. The technology save labour and product yield next to theoretical value.

Drying : The process use single chamber fluid bed drier. The sesame seeds float in hot air flow and polish by friction between seeds, which decrease sticky hull rate and improve the smoothness of finished product. It avoids the disadvantage of yellow, unpolished, high sticky hull rate etc. in normal fluid bed drier.

8. MANPOWER REQUIREMENT:

The enterprise requires 10 employees as detailed below:

Sr. No.	Designation Employees	Of Salary Per	Monthly Salary ₹	Number of Employees				
	Variable Labour: Workers		Per Annum	Year-1	Year-2	Year-3	Year-4	Year-5
1	Production Manager	18,000	18000	1	1	1	1	1
2	Operators	12,000	36000	3	3	3	3	3
3	Helpers	10,000	80000	8	8	8	8	8
			134000	12	12	12	12	12
1	Fixed Staff:							
2	Admin Manager	15,000	30000	2	2	2	2	2
3	Accounts/Stores Assistant	12,500	50000	4	4	4	4	4
	Office Boy	9,000	80000	3	3	3	3	3
	<i>Sub-Total</i>		160000	11	11	11	11	11
	Total		294000	23	23	23	23	23

9. IMPLEMENTATION SCHEDULE:

The project can be implemented in 4months' time as detailed below:

Sr. No.	Activity	Time Required (in months)
1	Acquisition of premises	2.00
2	Construction (if applicable)	2.50
3	Procurement & installation of Plant & Machinery	2.50
4	Arrangement of Finance	1.00
5	Recruitment of required manpower	1.00
	Total time required (<i>some activities shall run concurrently</i>)	4.00

10. COST OF PROJECT:

The project would necessitate utilities like water, electric power and fuel for roasting. Estimates for a project with a capacity of 3000 MTPA or 15 MT per day: 35 KL/day water, 1100 KWH /day power, 25 to 15 MTPD coal / FO, respectively as fuel, would be a basic requirement for the proposed project. Land (600 m²) Built up area: (150 m²) and plant and machineries like, Sesame seed pre - cleaning unit, de stoner, wire mesh basket, mixing tanks, vibratory screen, pulper and mechanical drier are major requirements. The Total Fixed Capital would be Rs. 40,13,613.

Sr. No.	Particulars	₹ in Lacs
1	Land	5.00
2	Building	15.00
3	Plant & Machinery	23.50
4	Furniture, other Misc. Equipments	5.00
5	Other Assets including Preliminary / Pre-operative expenses	2.35
6	Margin for Working Capital	56.00
	Total	106.85

11. MEANS OF FINANCE:

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

Sr. No.	Particulars	₹ in Lacs
1	Promoter's contribution	26.71
2	Bank Finance	80.14
	Total	106.85

12. WORKING CAPITAL CALCULATION:

The project requires working capital of ₹56.00 lacs as detailed below:

Sr. No.	Particulars	Gross Amt	Margin %	Margin Amt	Bank Finance
1	Inventories	28.00	0.25	7.00	21.00
2	Receivables	14.00	0.25	3.50	10.50
3	Overheads	14.00	100%	14.00	0.00
4	Creditors	-		0.00	0.00
	Total	56.00		24.50	31.50

13. LIST OF MACHINERY REQUIRED:

A detail of important machinery is given below:

Sr. No.	Particulars	UOM	Qty	Rate (₹ in Lacs)	Value (₹ in Lacs)
	Plant & Machinery / equipments				
a)	Main Machinery				
1	Sesame seed pre - cleaning unit	Nos	1	5.00	5.00
2	de stoner	Nos	1	3.00	3.00
3	wire mesh basket	Nos	1	2.50	2.50
4	mixing tanks	Nos	1	6.00	6.00
5	vibratory screen	Nos	1	2.00	2.00
6	pulper and mechanical drier	Nos.	1	2.40	2.40
7	Misc. Tools	LS	1	2.60	2.60
	<i>sub-total Plant & Machinery</i>				₹ 23.50
	Furniture / Electrical installations				
1	Office furniture and Electrification	LS	1	5.00	5.00
	<i>sub total</i>				₹ 5.00
	Other Assets				
1	preliminary and preoperative	LS			2.35
	<i>sub-total Other Assets</i>				2.35
	Total				30.85

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,
Delhi, India

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	168.00	196.00	224.00	252.00	280.00
3	Raw Materials & Other direct inputs	₹. In Lacs	126.35	147.41	168.46	189.52	210.58
4	Gross Margin	₹. In Lacs	41.65	48.59	55.54	62.48	69.42
5	Overheads except interest	₹. In Lacs	18.56	19.72	22.04	22.74	23.20
6	Interest @ 10 %	₹. In Lacs	8.01	8.01	5.34	4.01	3.21
7	Depreciation @ 30 %	₹. In Lacs	16.45	11.75	8.23	5.88	5.29
8	Net Profit before tax	₹. In Lacs	-1.37	9.11	19.93	29.86	37.73

The basis of profitability calculation:

This unit will have Processing Capacity of 300 MT and Sales Turnover 280 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 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 38.04 % of projected capacity as detailed below:

Sr. No.	Particulars	UOM	Value
1	Sales at full capacity	₹. In Lacs	280.00
2	Variable costs	₹. In Lacs	210.58
3	Fixed costs incl. interest	₹. In Lacs	26.41
4	$BEP = FC/(SR-VC) \times 100 =$	% of capacity	38.04%

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.