

1 DEHULLED AND ROASTED SESAME SEED OIL PROCESSING UNIT

1.1 Introduction

Sesame seed is rich in fat, protein, carbohydrates, fibre and some minerals. The aroma and taste of the seed are mild and delicious. It has a nut-like slightly sweet flavour. It is used mainly as a food ingredient in whole, broken, crushed, shelled, powdered and paste forms.

Prized oil is extracted from sesame seeds. Normally, the oil constituent is from 50 to 60 percent. This kind of oil seeds is renowned for its stability. It strongly resists oxidative rancidity even after long exposure to air.

Sesame is among the most important oil seeds of mankind, and one of its oldest. There are very different kinds of sesame oil available, and some knowledge about their culinary properties is required to make a competent choice. Sesame seeds are believed to be one of the first condiments as well as one of the first plants to be used for edible oil. The seeds contain about 50 to 60% of a fatty oil, which is characterized by a two lignanes, sesamin and sesamol (approximately 300 ppm in the oil), whence during refinement two phenolic antioxidants, sesamol (3,4-methylenedioxyphenol) and sesaminol, are formed.

Oil obtained by pressing such seeds contains besides true fats (lipids) several more constituents: Aroma compounds, which make up for the culinary character of the oil, vitamins, trace elements and more. With respect to lipids, in the plant kingdom nearly pure glycerides, one can further distinguish between saturated and unsaturated fats.

Sesame seed is also used in India for direct consumption as an ingredient for several snacks. The health benefits of this wonder seed are also known to Indians since centuries and the oil and the seed directly are used in several ayurvedic medicines.

Around 80 % of the sesame seed production in India, happens during the khariff season (June-July to September-October), with the crop starting to arrive from September. The remaining crop is cultivated in the rabi season (December to March), with the crop starting to arrive from March. An interesting aspect is that, almost all of the seeds from the rabi harvest are used for oil extraction, while the major portion is used for direct human consumption from the khariff harvest.

1.2 Objective

The primary objective of the model report is to facilitate the entrepreneurs in understanding the importance of setting up unit of sesame seed oil. This model report will serve as guidance

to the entrepreneurs on starting up such a new project and basic technical knowledge for setting up such a facility.

1.3 Raw Material Availability

Sesame seed production in the state is 53700 MT. The largest production is in Chhatarpur district with a production of 12500 MT (23.28%).

1.4 Market Opportunities

Global sesame seed production for the year 2004-2005 was 32.83 lakh MT, dominated by Asian and African countries. The global trade was 17.053 lakh MT valued at US \$ 1495.51 million. Japan, Egypt, South Korea, USA, Netherlands, and Gulf countries import substantial quantity of Dehulled sesame seed. Japan is the largest importer, accounting for 20% of the world trade, importing nearly 1.6 Lac tons per annum. China dominated the world in production and trade of de-hulled sesame seed accounting for 25% of the world trade producing around 725470 MT of sesame seed and 214803.49 MT of sesame oil in the year 2005.

India ranks second in the world accounting for 22% of the world trade with a production of around 6.80 lakh MT of sesame seed and 1.57 lakh MT of sesame oil in the year 2005. The other major producers of sesame seed in the year 2005 were Myanmar (5.50 lakh MT), Sudan (3 lakh MT), Uganda (1.10 lakh MT), Nigeria (0.75 lakh MT), Pakistan (0.68 lakh MT), Ethiopia (0.65 lakh MT), Bangladesh (0.50 lakh MT) and Central African Republic (0.43 lakh MT).

The current annual growth rate registered by the bakery industry is 7.5% and the confectionery industry is 9%.

Changing lifestyle and adoption of cosmopolitan food habits, increasing popularity of Chinese vegetarian food world wide, awareness and health consciousness are some of the factors which has increased the demand for roasted sesame seed oil.

The major sesame producing states are Rajasthan, Tamilnadu, Orissa, Madhya Pradesh, Andhra Pradesh, Maharashtra, UP, Punjab and Karnataka. India exports around 25% of the produced Sesame seeds annually, mainly to Germany, Turkey, The Netherlands, USA, Israel, Greece, Italy, China, Japan and UK.

1.5 Project description

1.5.1 Applications

Sesame oil is used as a salad or cooking oil and in shortening, margarine and soap. It is often considered the "queen" of vegetable oils. The outstanding characteristic of sesame oil is its stability and keeping quality as well as resistance to rancidity. Also, sesame oil is used in paints, soaps, cosmetics, perfumes and insecticides.

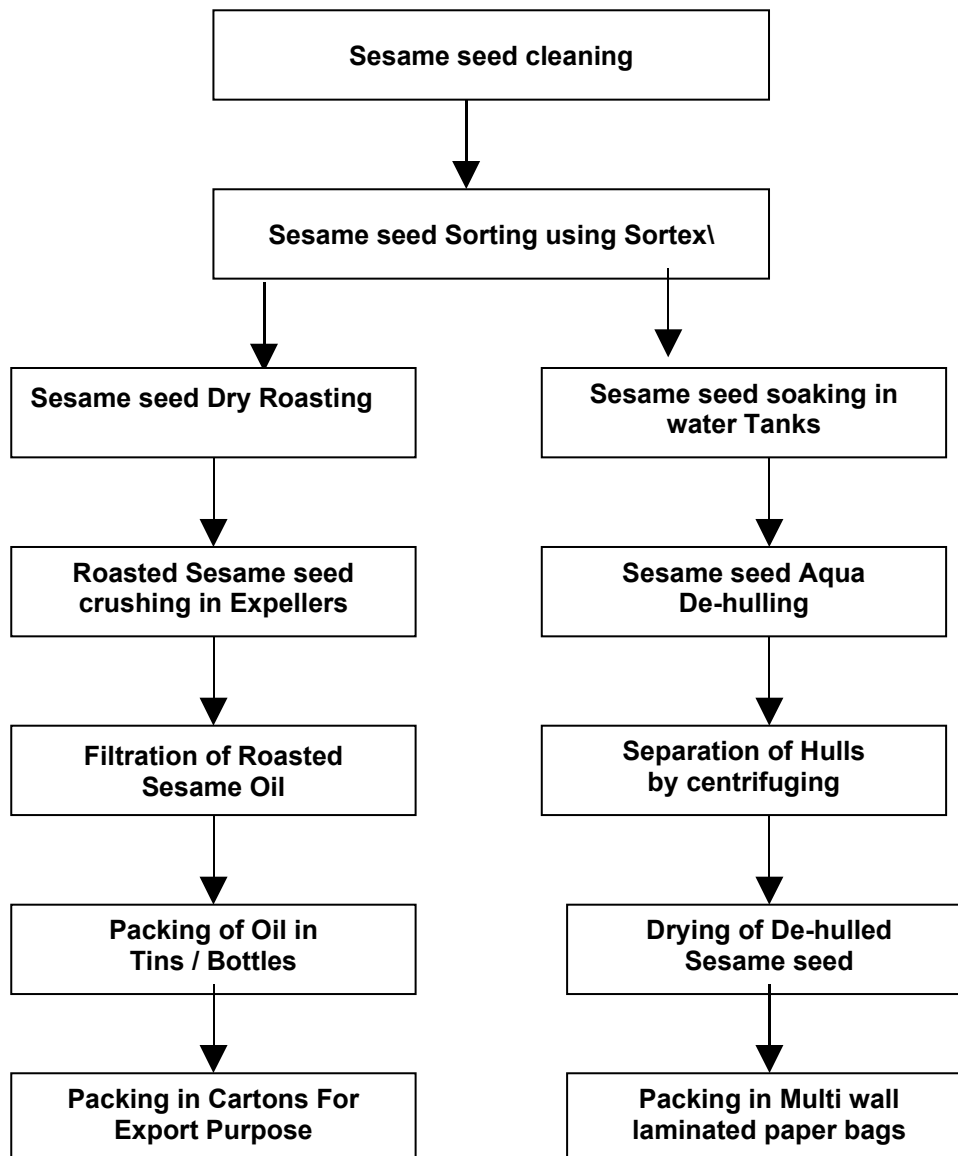
De-hulled sesame seed is mainly used to add texture, taste and aesthetic value to a variety of bakery products like bread, bread sticks, cookies, sesame bars etc; and also as an additive to cereal mixes and crackers. The whole seed is most important ingredient while preparing confectionery tahini (a halvah made from crushed, roasted and sweetened seeds) in the Gulf countries. The seed is rich in protein, carbohydrates, fibre, fat and some minerals content. Sesame Oil is mostly used as traditional cooking oil in Chinese food items and in Japan. 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.

1.5.2 Capacity of the Project

The total capacity of the unit is assumed to be 2200 Mt per annum.

1.5.3 Manufacturing process

Aqua de-hulling of sesame seeds is suggested for the proposed unit. The seeds available from market yards through brokers / traders or from farmers directly are cleaned in close vibratory type seed cleaners and aspiration system is provided to remove dust and other light weight impurities. These seeds are passed through "Sortex" machine (Electronic eye) for removal of inferior quality seeds. Cleaned seed are soaked in water for 4 to 6 hours and then put in aqua-De-huller machines, where hulls are removed using water force and water is finally drained out, and light weight hulls and other impurities are also removed. Wet De-hulled sesame seeds are dried using hot air under precise temperature control, so that moisture is removed as per the buyer's requirement.



1.6 Project component and cost

Major components of the projects and their costs are described in the table hereunder:

PARTICULARS	Unit	Qty	Cost/unit	Total
LAND & BUILDING				90.90
Land	SqM	4,200	250.00	10.50
Land Development				
Land Area		4,200	500.00	21.00
Building				
Production Block				
Main Production Area	SqM	600	5,000.00	30.00
RM & FG Store	SqM	400	5,000.00	20.00
Misc Handling Area	SqM	200	2,000.00	4.00
Contingencies		10%		5.40
PLANT & MACHINERY				168.00
Plant and machinery	LS	1	14,000,000.00	140.00
Contingencies		20%		28.00
MISCELLANEOUS FIXED ASSETS				5.58
Furniture and Fixture	LS	1	100,000	1.00
Sealing and wrapping machine	No	2	60,000	1.20
Vehicles-Delivery LCV	No	1	200,000	2.00
Weighing Scale	No	1	25,000	0.25
Others	LS	1	20,000	0.20
Contingencies		20%		0.93
PRE-OPERATIVE EXPENSES				33.82
Establishment		1	1,340,000	13.40
Professional Charges		1	1,322,300	13.22
Security Deposits		1	720,000	7.20
TOTAL				298.30

1.6.1 Building

The building development for the unit will cost around Rs. 59.40 lakhs.

1.6.2 Plant and Machinery

S. No.	Machinery
1	Hull Separators
2	Sortex
3	Soaking Tanks
4	Seed Cleaning
5	Aqua de hullers
6	Hot dryers
7	Dry Roasting
8	Expellers
9	Filter Presses

The total cost of the plant and machinery is Rs. 168 Lakhs.

1.6.3 Miscellaneous Assets

A provision of Rs. 5.58 lakhs would take care of all the requirements.

1.6.4 Preliminary & Pre-operative Expenses

A provision of Rs. 33.82 lakhs would take care of pre-production expenses like establishment, professional charges, security deposits etc.

1.7 Working capital assessment

ITEMS	Year 1	Year 3	Year 5
STOCK OF RAW MATERIAL & PACKING MATERIAL	73.20	109.80	109.80
SUNDRY DEBTORS	144.00	216.00	216.00
TOTAL	217.20	325.80	325.80
MARGIN	54.30	81.45	81.45
MPBF	162.90	244.35	244.35
INTEREST ON WC	17.92	26.88	26.88

1.8 Means of finance

EQUITY CAPITAL			35.82%	126.30
MOFPI SUBSIDY	25%	50.00	14.18%	50.00
TERM LOAN				
FINANANCIAL INSTITUTIONS		10.00%	50.00%	176.30
-Payable half yearly Installments	10	17.60		
TOTAL			100%	352.60

1.9 Cash flow statement

PARTICULARS	Year 1	Year 3	Year 5	Year 7
SOURCES OF FUNDS				
EQUITY CAPITAL	-	-	-	-
SUBSIDY				
NET PROFIT	34.02	79.13	75.48	72.81
(INTEREST ADDED BACK)				
DEPRECIATION	20.26	20.26	20.26	20.26
PRELIMINARY EXP.W/O	4.83	4.83	4.83	4.83
INCREASE IN TERM LOAN	-	-	-	-
INCREASE IN BANK BORROWINGS-WC	162.90	13.58	-	-
TOTAL	222.01	117.80	100.58	97.91

1.10 Projected balance sheet

PARTICULARS	Year 1	Year 3	Year 5	Year 7
LIABILITIES				
EQUITY CAPITAL	126.30	126.30	126.30	126.30
RESERVES & SURPLUS	48.47	120.60	206.68	299.00
TERM LOAN	158.70	88.30	17.90	(0.00)
BANK BORROWINGS-WC	162.90	244.35	244.35	244.35
TOTAL	496.37	579.56	595.23	669.65

1.11 Projected profit and loss account

Particulars	Year 1	Year 3	Year 5	Year 7
INCOME	1,056.00	1,584.00	1,584.00	1,584.00
EXPENDITURE	996.89	1,479.77	1,483.42	1,486.09
VARIABLE	833.89	1,244.75	1,244.75	1,244.75
FIXED	162.99	235.02	238.67	241.34
GROSS PROFIT	59.11	104.23	100.58	97.91
PROFIT BEFORE TAX	(1.53)	40.79	44.17	45.94
RETAINED PROFIT	(1.53)	40.79	44.17	45.94

1.11.1 Key indicators

NET PRESENT VALUE at current Inflation (Rs. in lakhs)	433.66
INTERNAL RATE OF RETURN %	25.77
AVERAGE DSCR	1.58
BREAK EVEN POINT %	86.46
PAY BACK PERIOD (YEARS)	5.28

1.11.2 Manpower Requirement

PARTICULARS	NO.
SUPERVISORY STAFF	
MANAGER	1
ACCOUNTANT & ADMN ASSISTANT	3
WORKERS	
PRODUCTION SUPERVISRS	2
MECH SUPERVISRS	1
SKILLED WORKERS	4
SEMI-SKILLED WORKERS	8

1.11.3 Assumptions

Project & Financing			
Contingencies on Building			10%
Contingencies on Equipment			20%
Term Loan			50%
Rate of Interest on Term Loan			10%
Subsidy Considered	Subject to ceiling		25%
Expected time of Installation	Months		10
Moratorium	Months		6
CAPACITY			
Rated Capacity Per Annum	80% of Installed capacity	TPA	2200
Number of Operational Days		DAYS	200
Working Hours Per day		Hrs	14
CAPACITY UTILIZATION			
Year I			60%
Year II			85%
Year III			90%
SALES PRICE			

W S Price	80000
OTHER EXPENSE	
Commission	10.0%
Marketing Expenses	2.5%
POWER	
Connected Load	180
DEPRICIATION AS PER COMPANY'S ACT	
BUILDING	3.34%
PLANT & MACHINERY	10.34%
MISC. FIXED ASSETS	7.07%
LAND & SITE DEVELOPMENT	1.63%
MAINTENANCE	
BUILDING	1.00%
PLANT & MACHINERY	3.00%
MISC. FIXED ASSETS	2.00%
LAND & SITE DEVELOPMENT	1.00%

1.11.4 Sources of technology

- Raylon Metal Works, PB NO. 17426, Andheri (E), Mumbai 400 059
- KSJ Foods & Services Pvt Ltd, Vile-Parle, Mumbai
- Somani International Corpn; 1510, Maker Chamber V, Nariman Point, Mumbai 400 021
- Gurunanak Engg. And Foundry works, 166, Focal Point, Mehta Rd., Amritsar-143039, Tel No. 2583542/2587943, Fax: 2587944

Some of the global manufacturers are:

- Saint First man Foodstuff Products (Nanjing) Inc. – China
- Ozsoy Tarim San. Ve Tic. Ltd. – Turkey
- Anhui Sinoresource Ltd. - China

Except Sortex machines all other Indigenous process technology is available and suppliers are:

- BÜheller India Ltd- Bangalore
- Desmet-Chemfood Pvt. Ltd- Mumbai
- Troika Process Pvt Ltd- Mumbai.

The actual cost of projects may deviate on change of any of the assumptions.

