

VEGETABLE OIL REFINERY



1.0 INTRODUCTION:

Vegetable oil and fat resources are indispensable to mankind as a source of nutrient and industrial raw materials. Crude vegetable oil obtained from various oil milling units is further refined before use for edible purposes. Refined edible oil is a process where free fatty acids are volatilized, condensed and recovered simultaneously with vacuum de-colouring operation.

Sometimes, refining process is limited to simple physical treatment such as heating and filtering in regard to refining of superior quality of crude oil. Generally the cake in the oil is separated by centrifuge, decolouring by active clay and steam deodorization at high temperature in vacuum up to 5 mm. Hg. This is not a location specific project and can be set up at a place where crude oil is easily available. The preferred locations can be Gujarat, AP, Maharashtra and so on.

2.0 PRODUCTS

It is possible to refine edible oils from crude groundnut oil, sesame oil, mustard oil etc. In this project, these three crude edible vegetable oils have been considered for refining purposes.

2.1 Apart from compliances under PFA Act, registration under AGMARK is advisable.

3.0 MARKET POTENTIAL

The importance of edible refined vegetable oils has been appreciated and ambitious plan has been chalked out to increase production of edible refined vegetable oils, including soya bean

oil, by the Government of India in the previous Five Year Plans. The demand for refined edible vegetable oils has increased in the consumer market. With growing population, increase in the disposable income and overall trend of consumerism, demand for edible oils is shooting up year after year. The country still imports large quantities of crude edible oil and the Kandla port of Gujarat is active in such imports. The domestic production has gone up during last few years but there still exists a gap between demand and supply which results in large imports. Thus a new vegetable oil refinery has got good potential.

4.0 MANUFACTURING PROCESS

Special pre-treatment steps which are essentially a combination of de-gumming and blending under special operating conditions, eliminate all impurities and render oil fit to be processed at elevated temperature under vacuum. Various steps involved in refining are

- (1) Super cleaning
- (2) Contobleaching and
- (3) De-acidification.

All these processes are very well standardized and practiced in the country since long. The average recovery is 90%

5.0 CAPITAL INPUTS

5.1 Land and Buildings

A plot of around 800 sq.mtrs. with built-up area of 600 sq.mtrs. shall be adequate. The built up area would accommodate three manufacturing sections leaving sufficient space for storage and packing. Cost of land would be around Rs. 2.40 lacs whereas that of civil work, it would be Rs. 15.00 lacs.

5.2 Plant and Machinery

It is proposed to install a plant to obtain refined vegetable oils of 4 tons every day or 1200 tons every year considering 300 working days.

The requirement of plant and machinery for the proposed capacity would be as below:

Particular		Quantity/ Unit No.
Super cleaning section		1 set
Contobleach Section		1 Set
Deacidification Section		1 Set
Steel Structure for main plant		1 Set
Water Cooling System		1 Set
Oil Storage Tanks		1 Set
Steam Generating Unit - Boiler etc- 150Kgs Capacity		1 Set
Water Softening Unit		One
Raw Material Storage Tanks		Two
Steam piping, accessories, tools and equipments etc.		1 Set

There are many turn-key suppliers of the refining plant and the estimated cost is Rs.60.00 lacs.

5.3 Miscellaneous Assets

Some other assets like furniture and fixtures, storage tanks, HDPE barrels, weighing scales, etc. are likely to cost Rs.10.00 lacs.

5.4 Utilities

Total power requirement shall be 75 HP whereas per day water requirement shall be 3000 ltrs.

5.5 Raw and Packing Materials

The major raw materials required are crude groundnut oil, crude sesame oil and crude mustard oil. The state of Gujarat is famous for crude as well as refined vegetable oils with centers like Kadi, Rajkot, Gondal, Amreli, Dhaari etc. engaged in production of various edible oils round the year. Thus procuring adequate quantity of crude oil will not be a bottleneck. Other materials like phosphoric acid, citric acid, bleaching powder etc would be available from the nearby trading centres. Aluminum tins or plastic jars of different capacities along with corrugated boxes, labels, and box strappings would be the packing materials.

6.0 MANPOWER REQUIREMENTS

Particulars	No	Monthly Salary (Rs.)	Total Monthly Salary (Rs.)
Machine Operators	4	3,500	14,000
Semi-skilled Workers	4	1,750	7,000
Helpers	6	1,250	7,500
Clerk	1	2,500	2,500
Salesman	1	2,500	2,500
		Total	33,500

7.0 TENTATIVE IMPLEMENTATION SCHEDULE

Activity	Period (in months)
Application and sanction of loan	2
Site selection and commencement of civil work	1
Completion of civil work and placement of orders for machinery	4
Erection, installation and trial runs	1

8.0 DETAILS OF THE PROPOSED PROJECT

8.1 Land and Building

(Rs. in lacs)

Particulars	Area (Sq.Mtrs)	Cost
Land	800	2.40
Building	600	15.00
	Total	17.40

8.2 Plant and Machinery

The total cost of machinery is estimated to be Rs.60.00 lacs, as explained earlier.

8.3 Miscellaneous Assets

The provision for miscellaneous assets of Rs. 10.00 lacs shall be adequate as explained earlier.

8.4 Preliminary and Pre-Operative Expenses

The registration charges, establishment expenses, trial run expenses, interest during implementation etc would be around Rs.8 lacs.

8.5 Working Capital Requirement

At 60% utilisation in the first year, the total working capital needs shall be as under:

(Rs. in lacs)

Particulars	Period	Margin	Total	Bank	Promoters
Stock of Raw and Packing Materials	½ Month	30%	11.70	8.20	3.50
Stock of Finished Goods	½ Month	25%	12.50	9.35	3.15
Receivables	½ Month	25%	14.30	10.75	3.55
Working Expenses	1 Month	100%	1.75	--	1.75
		Total	40.25	28.30	11.95

8.6 Cost of the Project and Means of Financing

(Rs. in lacs)

Items	Amount
Land and Buildings	17.40
Plant and Machinery	60.00
Miscellaneous Assets	10.00
Preliminary and Pre-operative Expenses	8.00
Contingencies @ 10% on land and building and machinery	7.75
Working Capital Margin	11.95
Total	115.10
Means of Finance	
Promoter's Contribution	34.53
Bank Loan/ Financial Institutions	80.57
Total	115.10
Debt Equity Ratio	2.34 : 1
Promoters Contribution	30%

Financial assistance in the form of grant is available from the Ministry of Food Processing Industries, Govt. of India, towards expenditure on technical civil works and plant and machinery for eligible projects subject to certain terms and conditions.

9.0 PROFITABILITY CALCULATIONS

9.1 Production Capacity and Build-up

The installed production capacity of the proposed unit would be 1200 MTA with 300 working days of 16 hours. The capacity utilization of 60% and 75% is envisaged during the first two years.

9.2 Sales Revenue at 100% Capacity

(Rs. in lacs)

Product	Qty. in Tonnes	Selling Price Per Ton/Rs.	Value
Refined Groundnut Oil	400	45,000	180.00
Refined Sesame Oil	300	55,000	165.00
Refined Mustard Oil	380	60,000	228.00
		Total	573.00

9.3 Raw and Packing Materials Required at 100%

(Rs. in lacs)

Product	Qty (Tonnes)	Rate per Ton	Value
Crude Vegetable Oils : Groundnut Oil	440	32,000	140.80
Sesame Oil	335	40,000	134.00
Mustard Oil	425	42,000	178.50
Phosphoric Acid, Bleaching Powder, Activated Carbon etc.	--	--	7.50
Packing Material @ Rs.600/Ton	--	--	6.48
		Total	467.28

9.4 Utilities

The annual cost of utilities at 100% activity level would be Rs.6.00 lacs.

9.5 Interest

Interest on term loan of Rs. 80.57 lacs has been calculated @ 14% per annum assuming repayment in 6 years including a moratorium period of 1 year, whereas interest on working capital would be 14% per annum.

9.6 Depreciation

It has been calculated on WDV basis @ 10% on building and 15% on machinery and other assets.

10.0 PROJECTED PROFITABILITY

(Rs. in lacs)

No	Particulars	1st Year	2nd Year
A	Installed Capacity	—1200 MTA —	
	Capacity Utilisation	60%	75%
	Sales Realisation	343.80	429.75
B.	Cost of Production		
	Raw and Packing Materials	280.37	350.46
	Utilities	3.60	4.50
	Salaries	4.02	4.75
	Stores and Spares	3.00	3.60
	Repairs and Maintenance	3.60	4.30
	Selling Expenses @ 4%	10.31	17.19
	Administrative Expenses	3.30	3.90
	Total	308.20	388.70
C.	Profit before Interest & Depreciation	35.60	41.05
	Interest on Term Loan	10.22	8.68
	Interest on Working Capital	3.96	4.95
	Depreciation	12.00	10.28
	Net Profit	9.42	17.14
	Income Tax @ 20%	1.90	3.44
	Profit after Tax	7.52	13.70
	Cash Accrual	19.52	23.98
	Repayment of Term Loan	--	14.60

11.0 BREAK-EVEN POINT ANALYSIS

(Rs. in lacs)

No.	Particulars	Amount
A	Sales	429.75
B	Variable Cost	
	Raw and Packing Materials	350.46
	Utilities (70%)	3.15
	Salaries (70%)	3.32
	Stores and Spares	3.60
	Selling Expenses (70%)	12.03
	Administrative Expenses (50%)	1.95
	Interest on working capital	4.95
	Total	379.46
C	Contribution (A - B)	50.29
D.	Fixed Cost	33.15
E.	Break-Even Point (D ÷ C)	65%

12.0 [A] LEVERAGES**Financial leverage**

$$\begin{aligned} &= \text{EBIT/EBT} \\ &= 23.60 \div 9.42 \\ &= 2.50 \end{aligned}$$

Operating Leverage

$$\begin{aligned} &= \text{Contribution / EBT} \\ &= 42.27 \div 9.42 \\ &= 4.49 \end{aligned}$$

Degree of Total Leverage

$$\begin{aligned} &= \text{FL/OL} \\ &= 2.50 \div 4.49 \\ &= 0.56 \end{aligned}$$

[B] Debt Service Coverage Ratio (DSCR)

(Rs. in lacs)

Particulars	1st Yr	2nd Yr	3rd Yr	4th Yr	5th Yr	6th Yr
Cash Accruals	19.52	23.98	26.13	29.08	31.90	33.99
Interest on TL	10.22	8.68	6.64	4.59	2.55	1.37
Total [A]	29.74	32.66	32.77	33.67	34.45	35.36
Interest on TL	10.22	8.68	6.64	4.59	2.55	1.37
Repayment of TL	--	16.10	16.10	16.10	16.10	16.07
Total [B]	10.22	24.78	22.74	20.69	18.65	17.44
DSCR [A] ÷ [B]	2.91	1.32	1.44	1.62	1.84	2.02
Average DSCR	----- 1.86 -----					

[C] Internal Rate of Return (IRR)

Cost of the project is Rs. 115.10 lacs.

(Rs. in lacs)

Year	Cash Accruals	16%	18%	20%
1	19.52	16.83	16.53	16.26
2	23.98	17.82	17.22	16.64
3	26.13	16.75	15.91	15.13
4	29.08	16.05	15.01	14.02
5	31.90	15.18	13.94	12.82
6	33.99	13.94	12.58	11.39
7	36.07	12.77	11.33	10.06
8	40.19	12.26	10.69	9.36
	240.86	121.60	113.21	105.68

The IRR is around 17%.

Some of the equipment and packing machinery suppliers are as under:

1. Sifter International, Plot No. 83, Sector 6, Faridabad-121006
Tel. No. 2231154-4540, Fax: 2230039
2. Osaw Agro Industries Pvt. Ltd., Osaw Complex, Jagadhri Road, Ambala Cant.-133001,
Tel. No. 2699167-354-547, Fax: 2699018
3. Forsberge Agritech (I) Ltd, GIDC Estate, Makarpura, Vadodara
4. Chempro, Engg. and Consultants, 43, Sukhshine Complex, Sunrise Park, Nr. Drive In,
Ahmedabad-380054. Tel No. 26851135/9010.
5. Container Industries, C-299, Ghatkopar Industrial Estate, 72 LBS Marg, Mumbai-400080