

## **DOUBLE FILTERED GROUNDNUT & OTHER OILS**

### **1. INTRODUCTION:**

Groundnut oil production in India is financially a profitable venture with huge export potential. In addition, you can initiate the groundnut oil processing operation as small and medium scale basis according to the desired output and project cost. Initiating a groundnut oil production business requires feasibility study preparation, procurement and installation of machines in the appropriate accommodation, recruitment of personnel and project commercial take-off. One metric ton of groundnut seed produces an average of 420 LTR of groundnut oil, 420Kg of groundnut cake, and 40Kg of groundnut sludge. Selecting a right location for factory operation is an important aspect. Major required utilities are water and electricity. Easy availability of transport facility and labour is important. Create a floor plan indicating specific space for raw material storage, finished products storage, production unit area, administrative work space, store room for oil cakes and space for miscellaneous usage. Generally, you will need to have 0.50 acre of nonagricultural land for establishing an improved groundnut oil expelling unit. Here, you can install plant with a processing capacity of 240 MT /annum. Additionally, the land must come with proper elevation.

### **2. PRODUCT & ITS APPLICATION:**

Wonderfully pleasant, sweet-flavored peanut oil is low in saturated fats, free from cholesterol, contains essential fatty acid ( linoleic acid (omega-6)) making it as one of the healthiest cooking oils. Being a vegetable oil, it is a good source of plant sterols, especially  $\beta$ -sitosterol. Nonetheless, the oil is especially rich in mono-unsaturated fatty acids (MUFA) like oleic acid (18:1) that helps lower LDL or "bad cholesterol" and increases HDL or "good cholesterol" in the blood. Research studies suggest that Mediterranean diet that is enriched with mono unsaturated fatty acids help to prevent coronary artery disease and strokes by favoring healthy blood lipid profile. Peanut oil contains resveratrol, a polyphenol antioxidant, which has been found to have protective function against cancers, heart disease,

degenerative nerve disease, Alzheimer's disease, and viral/fungal infections. Studies suggests that resveratrol cut stroke risk through altering at molecular mechanisms in the blood vessels (reducing susceptibility to vascular damage through decreased activity of angiotensin, a systemic hormone causing blood vessel constriction that would elevate blood pressure) and by increasing production of the vasodilator hormone, nitric oxide. Peanut oil contains valuable amounts of antioxidant vitamin E. 100 g fresh oil has 15.69 mg of 伪-tocopherol and 15.91 mg of gamma-tocopherol. Vitamin E is a powerful lipid soluble antioxidant, required for maintaining the integrity of cell membrane of mucosa and skin by protecting it from harmful oxygen-free radicals. In addition to being a vegetable source, peanut oil is also an ideal choice for deep-frying where it can be heated to higher temperatures (smoke point -450). This results in lower oil retention in the fried foods. Studies suggests that resveratrol cut stroke risk through altering at molecular mechanisms in the blood vessels (reducing susceptibility to vascular damage through decreased activity of angiotensin, a systemic hormone causing blood vessel constriction that would elevate blood pressure) and by increasing production of the vasodilator hormone, nitric oxide. Peanut oil contains valuable amounts of antioxidant vitamin E. 100 g fresh oil has 15.69 mg of 伪-tocopherol and 15.91 mg of gamma-tocopherol. Vitamin E is a powerful lipid soluble antioxidant, required for maintaining the integrity of cell membrane of mucosa and skin by protecting it from harmful oxygen-free radicals. In addition to being a vegetable source, peanut oil is also an ideal choice for deep-frying where it can be heated to a higher temperatures (smoke point -450 DEG. F). This results in lower oil retention in the fried foods.

### **3. DESIRED QUALIFICATIONS FOR PROMOTER:**

Successful running this project does not require any specific qualification.

### **4. INDUSTRY LOOKOUT AND TRENDS**

India's edible oil production is expected to rise in the on-going oil year (November 1 to October 30) 2016-17 and is likely to increase by 17.4% to 7.68 million tonnes on a y-o-y basis during the year. Though the rise in output appears to be good, it does not solve the country's problem of insufficient production and the high reliance on imports. One of the

solutions to this problem is to encourage farmers to increase oilseeds production as it will help the country to at least reduce the dependence on imports. Also, this will help increase the capacity utilization of the edible oil manufacturers in the country.

## **5. MARKET POTENTIAL AND MARKETING ISSUES, IF ANY:**

Ground-nuts are a popular source of food throughout the world. Groundnut oil is used for cooking food and as a shortening or as a base for confectioneries and they can be used to make peanut butter. Groundnut oil ranks at the top among edible oils exported from India. It is premium oil and its cost is also high. Most other edible oils are priced lower than groundnut oil. Groundnut oil is available in the market in refined and filtered forms. Although filtered oils are nutritionally superior in quality. The size of the global groundnut oil market is about 188,000 MT, during FY2013. Additionally, India exports about 16,500 MT of groundnut. With liberal export policies and a good domestic crop, exports are expected to exceed 25,000 MT in FY 2015. Production of Groundnut decreased from 7.4 million (2013-14) to 6.7 million tons (2015-16) showing a decline of about 9 %. However, production is estimated to be at 8.47 million tons in 2016-17. Argentina and Brazil were the top two exporting countries of Groundnut oil in 2015-16. India was the 10<sup>th</sup> largest exporting country of groundnut oil in the world in 2015-16. China and Italy were the major importing country of groundnut oil in 2015-16.

## **6. RAW MATERIAL REQUIREMENTS:**

The principal raw material required for the production of groundnut oil is groundnut seed. And you can procure this locally. The seed gives 44.5-50% oil, 50-55% meal. However, other required raw materials are caustic soda, bleaching earth, and packaging consumables.

## **7. MANUFACTURING PROCESS:**

**Groundnut Oil Production Process & Technology:** Basically, you can divide the edible oil technology into two groups. These are mechanical pressing and solvent extraction. For oilseeds with high oil content such as groundnut, you will need to apply first mechanical

pressing. Here, you can extract over 85% of the oil. However, you can extract the remaining oil in the expeller cake with a solvent. As per mechanical pressing technology, you can divide the groundnut oil production process into three stages. These are seed preparation, pressing and crude oil refining. Storage → Cleaning → Dehulling → Grinding or rolling → Heating → Pressing oil cakes → Refining impurities → Purified Edible Oil.

1. Cleaning: The first step in preparing oil seeds for oil extraction is to clean them. Clean properly so that the oil is not contaminated with foreign materials. Therefore, it helps to precede the extraction process as efficiently as possible. During the process, carefully inspect the seeds to remove stones, sand, dirt and spoilt seeds. Additionally, you can use dry screening technique to remove all material that is over or undersized. Sometimes washing is also resorted to but it must be avoided as the plant tissue will have to be dried at a later stage.

2. Dehulling: During the process, remove the outer seed coat of the oil seed. Generally, you can use a power operated dehuller for the operation. Removal of the outer seed coat is necessary as it does not contain oil and inclusion of it in the unit operations makes the oil extraction process less efficient. Some seeds such as groundnut can be shelled by hand. Some other such as sunflower seeds is usually hulled in machines. Still others, like safflower and colza, cannot be shelled.

3. Grinding or rolling: Seed is not usually pressed whole since oil extraction is more efficient if the seed is in smaller particles. Herein lays the relevance of the grinding process. Grinding is the process for reducing the particle size. Additionally, you can use small motor powered hammer mills for the unit operation. Another alternate process used for reduction of particle size is rolling the oilseeds to produce flakes for oil extraction. Many large-scale commercial plants find this the most effective approach. Additionally, with large oilseeds, it may be necessary to grind the seed first, and then put the pieces through the flaking rollers.

4. Heating: It is the final step for preparing the raw material for oil extraction. Heating leads to increased oil yield. Heating helps in killing those enzymes present in the plant tissue which have a deteriorating effect on oil quality. Moreover, if you don't use the oilseed cake for feed

or feed, heating is useful as it increases protein availability. Sometimes, you can press the oil bearing material without heating it. Oil extracted in this way is called cold press oil.

5. Pressing: During processing, press the conditioned oil seeds/oil bearing material using a lever press, hydraulic press or a mechanical expeller to remove the oil.

6. Refining: When you use the lower quality feedstock for oil extraction, you can use this process. Basically, it helps in removing undesirable cloudiness, color, and flavor from the extracted oil.

### 8. MANPOWER REQUIREMENT:

Sr. No.	Designation	SALARY	Salary ₹	Number of Employees				
				Year-1	Year-2	Year-3	Year-4	Year-5
	<b>Working Staff</b>		<b>PER ANNUM</b>					
1	Production Manager	18000	18000	1	1	1	1	1
2	Operators	12000	48000	4	4	4	4	4
3	Helpers	10000	120000	12	12	12	12	12
			186000	17	17	17	17	17
1	<b>Fixed Staff:</b>							
2	Admin Manager	15000	30000	2	2	2	2	2
3	Accounts/Assistant	12500	37500	3	3	3	3	3
	Office Boy	9000	27000	3	3	3	3	3
	<i>Sub-Total</i>		94500	8	8	8	8	8
	Total		280500	25	25	25	25	25

### 9. IMPLEMENTATION SCHEDULE:

The project can be implemented in 9 months' 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 ( <i>some activities shall run concurrently</i> )	9.00

## 10. COST OF PROJECT:

The project shall cost ₹ 685.00 lacs as detailed below:

Sr. No.	Particulars	₹ in Lacs
1	Land	10.00
2	Building	18.00
3	Plant & Machinery	100.00
4	Furniture, other Misc. Equipments	7.00
5	Other Assets including Preliminary / Pre-operative expenses	10.00
6	Margin for Working Capital	540.00
	<b>Total</b>	<b>685.00</b>

## 11. MEANS OF FINANCE:

Bank term loans are assumed @ 75 % of fixed assets.

Sr. No.	Particulars	₹ in Lacs
1	Promoter's contribution	171.25
2	Bank Finance	513.75
	<b>Total</b>	<b>685.00</b>

## 12. WORKING CAPITAL CALCULATION:

The project requires working capital of ₹540.00 lacs as detailed below:

Sr. No.	Particulars	Gross Amt	Margin %	Margin Amt	Bank Finance
1	Inventories	270.00	0.25	67.50	202.50
2	Receivables	135.00	0.25	33.75	101.25
3	Overheads	135.00	100%	135.00	0.00
4	Creditors	-		0.00	0.00
	<b>Total</b>	540.00		236.25	303.75

### 13. LIST OF MACHINERY REQUIRED:

1. Pre-cleaner for cleaning the oil seeds
2. Cans and trays for handling oil seeds
3. Batch type solar dryer
4. Tapering screw types mechanical oil expeller
5. Filter press
6. Steel drums for storing edible oil and sedimentation of impurities
7. Weighing balance
8. Semiautomatic bottle filling machine
9. Molded polycarbonate bottle capping cum sealing machine

A detail of important machinery is given below:

Sr. No.	Particulars	UOM	Qty	Rate	Value
	<b>Plant &amp; Machinery</b>				<b>100.00</b>
	<b>Furniture / Electrical installations</b>				
1	Office furniture	LS	1	300000	3.00
	Stores Cupboard	LS	1	200,000	2.00
	Computer & Printer	LS	1	200000	2.00
1	<i>sub total</i>				<b>7.00</b>
	<b>Other Assets</b>				
	Preliminary and preoperative				10.00
	<i>sub-total Other Assets</i>				10.00
	<b>Total</b>				<b>117.00</b>

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

#### **14. PROFITABILITY CALCULATIONS:**

<b>Sr. No.</b>	<b>Particulars</b>	<b>UOM</b>	<b>Year-1</b>	<b>Year-2</b>	<b>Year-3</b>	<b>Year-4</b>	<b>Year-5</b>
1	Capacity Utilization	%	60%	70%	80%	90%	100%
2	Sales	₹. In Lacs	1620.00	1890.00	2160.00	2430.00	2700.00
3	Raw Materials & Other direct inputs	₹. In Lacs	1342.99	1566.82	1790.66	2014.49	2238.32
4	Gross Margin	₹. In Lacs	277.01	323.18	369.34	415.51	461.68
5	Overheads except interest	₹. In Lacs	21.07	22.39	25.02	25.81	26.34
6	Interest @ 10 %	₹. In Lacs	51.38	51.38	34.25	25.69	20.55
7	Depreciation @ 30 %	₹. In Lacs	30.00	21.00	15.30	12.00	9.00
8	<b>Net Profit before tax</b>	₹. In Lacs	<b>174.56</b>	<b>228.41</b>	<b>294.77</b>	<b>352.01</b>	<b>405.79</b>



The basis of profitability calculation:

This unit will have 3000 MT/Annum capacity. 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 10.16 % of projected capacity as detailed below:

Sr. No.	Particulars	UOM	Value
1	Sales at full capacity	₹. In Lacs	2700.00
2	Variable costs	₹. In Lacs	2238.32
3	Fixed costs incl. interest	₹. In Lacs	46.89
4	$BEP = FC/(SR-VC) \times 100 =$	% of capacity	10.16%

## 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

Udyamimitra portal ( link : [www.udyamimitra.in](http://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.