

Sector	Agro and Food Processing
Sub - sector	Food Processing
Project No.	AF-09
Project Title	Peanut Butter Manufacturing Unit

Project Description

The project envisages setting up of an Export Oriented Unit (EOU), for manufacturing Peanut Butter. Peanut Butter is popular bread spread in USA and other Western countries as well as countries which have US influence like South Korea, Philippines, Thailand, etc.

Product Application

Peanut butter is a low calorie, high protein and balanced nutritive values and price competitive product. It is an idyllic alternative for Dairy butter as bread spread. It is consumed in large quantities in USA and Western countries and has good potential for export and the untapped domestic market as the product is relatively new for India.

Market & Growth Drivers

The global trade of Peanut Butter was around 109,973 MT, valued at US \$ 188 million during the year 2004 - 2005. Peanut Butter is part of the staple break-fast food in US. Statistics says that about 89% of the entire US households consume it as bread spread. This is further evident from the fact that about one-third of the US peanut harvest is utilized for manufacturing peanut butter. This is approximately 1.2 billion pounds of peanuts every year.

The world's largest producer of peanut butter is Procter and Gamble, USA – having “JIF” brand. The company has capacity to produce 250,000 Jars / day of peanut butter. Other major manufacturer of Peanut butter is Unilever Best foods, USA (formerly California Mfg. Co. Inc).

The consumption of peanut butter is also high in the countries like Philippines, South Korea, Canada, etc. as they are well influenced by US culture.

Trade Statistics - Peanut Butter, India

Sr. No.	Particulars	Year			
		2003 - 2004	2004 - 2005	2005 - 2006	Total
1	Export	(Q) 2357.53	(Q) 2045.15	(Q) 2521.83	(Q) 6924.51
		(V) 1289.96	(V) 1100.76	(V) 1394.10	(V) 3784.82
2	Import	(Q) 10.6	(Q) 11.42	(Q) 12.05	(Q) 34.07
		(V) 6.86	(V) 30.05	(V) 38.17	(V) 75.08
Source: Department of Commerce, India, Q=Quantity in MT and V= Value Rs. In Lacs					

As it can be observed from above import-export statistics for peanut butter for last three years period , though there is excellent potential in the global markets, Indian export has increased marginally, both in terms of quantity and value.

A few major manufacturers of Peanut butter in India are:

- Bajaj Foods Limited, Ahmedabad
- Suprat Enterprise, Ahmedabad

Considering India's position as the world's second largest producer of peanuts in the world, its share in the world market is restricted to raw peanuts only, with negligible contribution in value added products like Peanut Butter, roasted - blanched, and coated peanuts etc;. Thus, there is ample scope for development.

India is facing high levels of fluctuation in production and due to its failure in producing aflatoxin free Peanuts, the value added products are not finding an export market.

Though, the Domestic market for Peanut Butter is small at present, its export potential is good and with people becoming more health conscious the local market is sure to develop.

Growth Drivers

- The market for Peanut butter is likely to grow due to emerging demand for healthier and nutritious products.
- Demand in healthier Low calories & low fat food like wheat bread and peanut butter due to emergence of nuclear family and hectic life schedule.
- Changing life style and shift towards consumption of convenient food.

Why Gujarat?

Gujarat is known as the Groundnut bowl of India. Being mainly a rain fed crop there is high level of fluctuation in its production. It contributed 54.5%, with 44.78 Lac MT, of the total production in the year 2003-2004, which considerably reduced to 17.05 Lac MT in the year 2004-2005. However, With the accessibility of Narmada Canal irrigation facility the production in the Saurashtra region (contributing to about 90% of the State's produce) will stabilize and there are possibilities of increase in production.

Peanut butter is very popular bread spread in USA and Peanut Butter Sandwich is used regularly by all class of people including Non resident Gujarati (NRGs), as regular staple food. This offers good export opportunity for a quality Peanut Butter product in USA & Canada.

Manufacturing Process / Technology Sources

- Pre cleaning and shelling of Ground nuts in shell
- Kernel Grading using Sortex
- Dry roasting, Cooling and blanching: A photometer indicates when the cooking is complete. At the exact time cooking is completed, the roasted peanuts are removed from heat as quickly as possible in order to stop cooking and produce a uniform product. The hot peanuts then pass from the roaster directly to a perforated metal cylinder (or blower-cooler vat), where a large volume of air is pulled through the mass by suction fans. The peanuts are brought to a temperature of 86 degrees Fahrenheit (30 degrees Celsius). Once cooled, the peanuts pass through a gravity separator that removes foreign materials. The skins (or seed coats) are now removed with either heat or water. The heat blanching method has the advantage of removing the hearts of the peanuts, which contain a bitter principle.

Heat blanching: Depending on the variety and degree of doneness desired, the peanuts are exposed to a temperature of 280 degrees Fahrenheit (137.7 degrees Celsius) for up to 20 minutes to loosen and crack the skins. After cooling, the peanuts are passed through the blancher in a continuous stream and subjected to a thorough but gentle rubbing between brushes or ribbed rubber belting. The skins are rubbed off, blown into porous bags, and the hearts are separated by screening.

Water blanching: A newer process than heat blanching, water blanching was introduced in 1949. While the kernels are not heated to destroy natural antioxidants, drying is necessary in this process and the hearts are retained. The first step is to arrange the kernels in troughs, then roll them between sharp stationary blades to slit the skins on opposite sides. The skins are removed as a spiral conveyor carries the kernels through a one-minute scalding water bath and then under an oscillating canvas-covered pad, which rubs off their skins. The blanched kernels are then dried for at least six hours by a current of 120 degrees Fahrenheit (48.8 degrees Celsius) air.

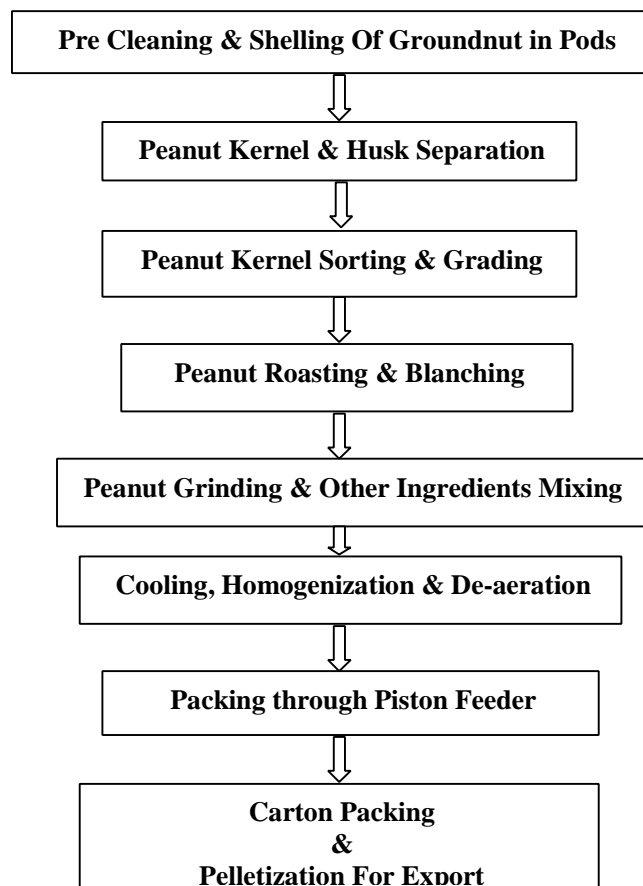
- **Grinding and Mixing of ingredients (In this phase peanut butter is prepared):** Peanut butter is usually made by two stage grinding operations. The first reduces the nuts to a medium grind and the second to a fine, smooth texture. For fine grinding, clearance between plates is about .032 inch (.08 centimeter). The second milling uses a very high-speed grinder cum mixer that has a combination cutting-shearing and attrition action and operates at 9600 rpm. This milling produces a very fine particle with a maximum size of less than 0.01 inch (.025 centimeter).

Peanuts are kept under constant pressure from start to finish of the grinding process to assure uniform grinding and to protect the product from air bubbles. A heavy screw feeds the

peanuts into the grinder. This screw may also deliver the de-aerated peanut butter into containers in a continuous stream under even pressure.

- **Rotator for creating texture of Peanut Butter:** From the grinder, the peanut butter goes to a stainless steel hopper, which serves as an intermediate mixing and storage point. The stabilized peanut butter is cooled in this rotating refrigerated cylinder (called a votator), from 170 to 120 degrees Fahrenheit (76.6 to 48.8 degrees Celsius) or less before it is packaged.
- **Packing:** The stabilized peanut butter is automatically packed in jars, capped, and labeled. Since proper packaging is the main factor in reducing oxidation (without oxygen no oxidation can occur), manufacturers use vacuum packing. After it is put into final containers, the peanut butter is allowed to remain undisturbed until crystallization throughout the mass is completed. Jars are then placed in cartons and placed in product storage until ready to be shipped out to retail or institutional customer

Peanut Butter technology could be sourced from CFTRI, Mysore or from any established food technology and machinery suppliers from India. The unit shall require procuring few critical Plant and Machineries / equipments from abroad to meet quality requirements as per international quality requirements. The manufacturing process is schematically shown in following diagram:



Raw Materials

The main raw materials required for making Peanut Butter are peanut kernels, sugar, salt, emulsifier, and preservatives. Since, Gujarat is one of the leading states producing peanuts (Groundnut) in India, the main raw material is easily available in sufficient quantities.

The ground nut area, production and yield per hectare are summarized here to give overview of raw material availability for the proposed project.

Area, Production and Yield - Groundnut

Sr. No.	Year	Area ('00 Hectares)	Production ('00 MT)	Yield, Kg. / Hectare
1	2000-01	17,448	6,882	394
2	2001-02	18,877	26,466	1,402
3	2002-03	20,294	10,945	539
4	2003-04	20,034	44,776	2,235
5	2004-05	19,850	18,120	913

Source: Department of Agriculture Statistics, Gandhinagar, Government of Gujarat

Amreli, Bhavnagar, Jamnagar, Junagadh and Rajkot are main Groundnut producing five districts of Saurashtra region in Western part of Gujarat. As observed from the above table, there is increase in area and production of groundnut in Gujarat. However, there are wide fluctuations in yield per hectare, which will now be consistent with availability of improved irrigation facilities in main groundnut cultivation areas.

It is worth noting here that Gujarat has remained as one of the leading exporters of HPS (Hand picked selected) peanuts in the global markets, hence its quality is established for value added processing.

Suggested Plant Capacity & Project Cost

The proposed units Capacity is 3,000 MTPA of raw material, which will produce 2,250 MTPA of finished product.

Capital cost is estimated to be INR 30 million (US \$ 0.67 million). Detailed cost of project and means of finance are as summarized below:

Estimated Project cost & Means of finance

Sr. No.	Description	INR in Million
1	Land and Land Development	1.0

Sr. No.	Description	INR in Million
2	Building & Civil work	5.0
3	Plant & Machinery	16.0
4	Other Fixed Assets	1.5
5	Preliminary & Pre-operative	2.0
6	Provision for contingencies	1.63
	Fixed Cost of Project	27.13
7	Margin Money for working capital	2.87
	Total Cost of Project	30.00
	Means of Finance	
8	Equity	8.50
9	Debt	21.50
	Total Means of Finance	30.00

As indicated above the proposed project will require approx. 4000 Sq.mt of land and proposed built up area for proposed unit will be approx. 1000 Sq.mt. The unit will have installed capacity of 10 TPD on single shift working basis. Total estimated fixed cost of the project is INR 27.12 million and INR 2.87 million will be as working capital margin, which will make estimated Block capital cost of INR 30 million. Since, the proposed unit is EOU, a Debt: Equity ratio of 2.5:1 is suggested. Thus, the estimated term loan amount would be of INR 21.5 million and Equity will be INR 8.5 million.

Plant and Machinery

Proposed plant and machineries details are as summarized below:

List of Main Plant and Machinery

Sr. No.	Particulars	Quantity	Suppliers
1	Hoppers & Elevators	3	Goldin (India) Equipment Pvt. Ltd., Vadodara
2	Seed Cleaner	1	Goldin (India) Equipment Pvt. Ltd., Vadodara
3	De-stoner	1	Goldin (India) Equipment Pvt. Ltd., Vadodara
4	Vibrating Sieve with dust aspiration system	1	Goldin (India) Equipment Pvt. Ltd., Vadodara
5	Pods Opener with pneumatic Husk separator	1	Parmar Engineering Co.Jasdan,
6	Slotting Screen	1	Goldin (India) Equipment Pvt. Ltd., Vadodara
7	Picking / Sorting Tables	2	Shriji Nut Co., Jam Kandorna, Rajkot
8	Vibrating Screen	1	Goldin (India) Equipment Pvt. Ltd., Vadodara
9	Radiant Ray Roaster for dry roasting	1	Shriji Nut Co., Jam Kandorna, Rajkot
10	Cooling Sieve	1	Shriji Nut Co., Jam Kandorna, Rajkot
11	Whole / broken nut blancher	1	Shriji Nut Co., Jam Kandorna, Rajkot
12	1st stage Peanut Butter mill	1	John Fowler & Co. Ltd, Bangalore
13	2nd Stage Peanut Butter mill	1	John Fowler & Co. Ltd, Bangalore
14	Stabilizer Feeder	1	Shriji Nut Co., Jam Kandorna, Rajkot

Sr. No.	Particulars	Quantity	Suppliers
15	Ingredient Feeder	1	Shriji Nut Co., Jam Kandorna, Rajkot
16	Ribbon Blender	2	Shriji Nut Co., Jam Kandorna, Rajkot
17	Scrap Surface Heat Exchanger	1	SSP, New Delhi / Cheery Burrel, USA
18	Ammonia Chilling Plant for refrigeration	1	Alfa-Laval India Ltd., Pune
19	SS Piping Kit	Lot	Alfa-Laval India Ltd., Pune
20	Piston Feeler for Peanut Butter Packing line	2	Alfa-Laval India Ltd., Pune
21	Chamber less vacuum packing machine	1	Alfa-Laval India Ltd., Pune
22	Electronic Weighing scale 1 to 5 Kg.size	3	Anamed / Every India Ltd-Ahmedabad
23	Pellet Truck for Loading in Container	1	Godrej & Boyce Mfg. Co. Ltd., Mumbai

Utilities

The unit will have utility requirement in terms of water, electric power and fuel for roasting. 30 KL water, 80 HP power and 2.5 KL HSD as fuel will be required per day for the proposed unit.

Estimated Man Power Required

Estimated total manpower requirement for the proposed unit is 20 persons, which comprises of 3 Managerial persons, 8 persons staff in manufacturing section, 2 persons in Quality control , 7 other staff including purchase and marketing assistants

Suggested Location

Saurashtra region of western Gujarat is known as the groundnut bowl of India. Amreli, Bhavnagar, Jamnagar, Jungadh and Rajkot are main Groundnut producing five districts of Saurashtra and hence suggested location for proposed Peanut Butter project in Gujarat is in this region. These districts also have availability of basic industrial infrastructure, like land, water, power, manpower and transport facilities for domestic and export market access.

Project Time Line

The proposed project will require approx. 4 to 6 months in obtaining necessary clearances from respective authorities. The project implementation period will be approx. 8 to 12 months.

Financial Indicators

Based on the profitability projections worked out for the proposed project, key financial indicators are as summarized below:

Key Financial Indicators for Proposed Unit

Sr. No.	Financial Indicators	1st Year	2nd year	3rd year
A	Break Even Point (%)	31.24	28.77	27.24
B	Debt Service Coverage Ratio	1.65	2.03	2.35
C	Average DSCR	2.01		
D	Return on Investment (ROI), %	21.45	25.88	28.69
E	IRR for 10 years Project period	40%		

As observed from the table of Project cost and Means of finance, being an EOU (Export Oriented Unit) the suggested Debt Equity Ratio for the proposed project is 2.5: 1.0. The IRR (Internal Rate of Return) for the proposed project is approx. 40% for a projected period of 10 years.

Clearances required

The proposed unit will have to register itself with Secretariat of Industrial Approvals (SIA), Ministry of Industries and Government of India, by filing Industrial Entrepreneur's Memorandum (IEM), as it will have plant and machinery investment of more than INR 10 million.

As mentioned previously the proposed unit is EOU and major peanut butter market is in advanced countries like USA, Canada, UK, Europe and Australia. The unit will be required to get registered their products with Food and Drugs Administration (FDA) in these countries, apart from registration with Indian and state food administration.

The most critical aspect of this product will be its shelf life for export consumers and hence there will need for import of stabilizers and preservative meeting FDA regulations in consuming countries and Codex standards followed by them.

The unit will get EOU registration from RBI, DGFT and with APEDA as registered manufacturer exporter to avail export incentives.

Being an EOU the unit will have to follow strict quality standards as accepted in the countries where export is to be made. BIS has laid the quality norms for Peanut Butter in their standard IS 9037:1979 and it is obligatory to meet provisions under the PFA act for all ingredients and quality aspects for marketing the product in the Indian market.

Agencies to be contacted

Industrial Extension Bureau

Mott MacDonald India

Gujarat Agro Industries Corporation Ltd.