

PROCESSING OF PEANUT BUTTER



AATMANIRBHAR BHARAT

**PM Formalisation of Micro Food Processing
Enterprises Scheme (PM FME Scheme)**

Industrial Overview:

- Peanut is a legume crop grown mainly for its edible seeds.
- Peanuts are similar in taste and nutritional profile to “tree nuts”.
- Peanut butter is a food paste or spread made from ground, dry-roasted peanuts.
- Can contain additional ingredients that modify the taste or texture
- These ingredients include:
 1. Salt
 2. Sweeteners
 3. Emulsifiers



Product Description:

- Peanut butter is served as a spread on bread, toast, or crackers
- It's used to make sandwiches like peanut butter & jelly sandwich
- It is also used in a number of breakfast dishes & desserts
- It is similar to other nut butters such as cashew & almond butter
- Two main types of peanut butter are crunchy & smooth types
- In crunchy type some coarsely-ground peanut fragments are included



Market Potential:

Global Peanut Butter market was valued USD 3.5 billion in 2019

Expected to Grow at CAGR of 4.6% from 2020 to 2025

It's global market size is projected to reach USD 4.38 billion by 2025

Indian market is expected to Grow at CAGR of 8.2% from 2020-25

Market Drivers:

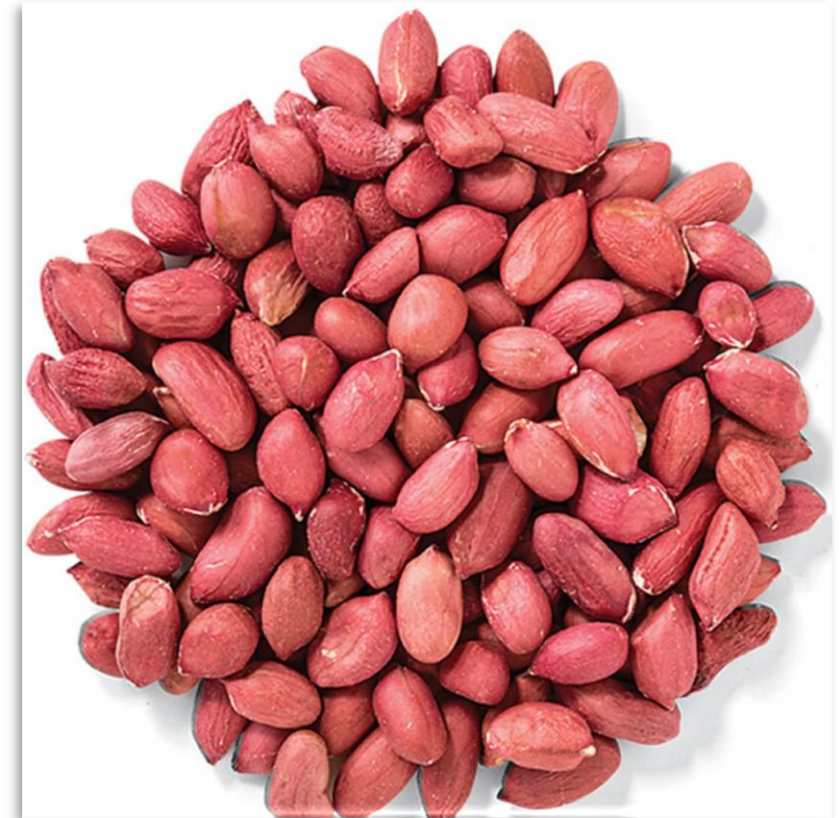
- Increase in demand for High Protein Food
- Increasing number of restaurants
- Increasing Peanut Production in Country
- Rise in income of Consumer

FACTORS AFFECTING MARKET POTENTIAL



Raw Materials Required:

1. Peanuts
2. Packaging Material



Raw Material Description:

- The peanut, also known as the groundnut botanically known as *Arachis hypogaea*.
- It is a legume crop grown mainly for its edible seeds.
- Peanut butter is served as a spread on bread, toast or crackers, and used to make sandwiches
- Peanut butter is a food paste or spread made from ground dry roasted peanuts.
- It is also used in a number of confections, such as peanut-flavored granola bars or croissants and other pastries.

INTRODUCTION

Types of Raw Material:

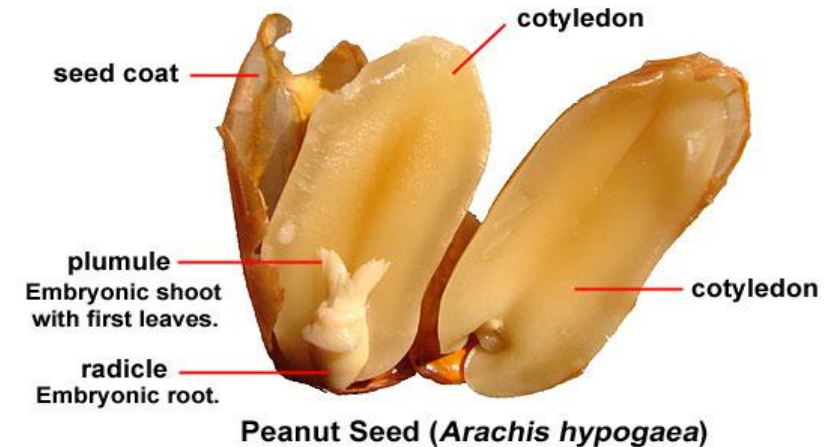
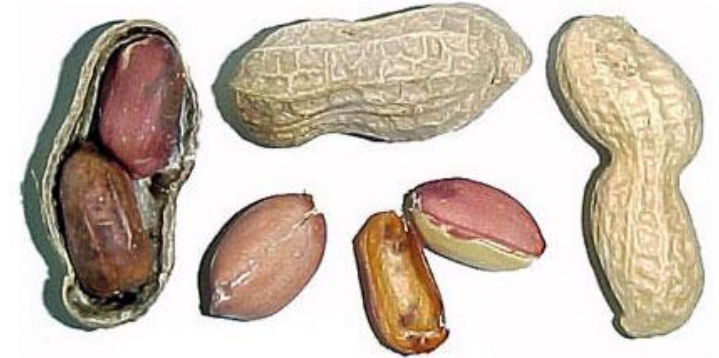
The following variety are consider as High-yielding varieties of Groundnut for

S. no.	Varieties	Av. yield (q/ha)	Special character
1.	AK12-24	16.00	Resistant to leaf spot and rust, seeds rosy in color having no dormancy
2.	Smruti OG52-(1)	25.00	Kernel bold, red in color, resistant to collar rot and stem rot, no dormancy.
3.	TAG 24	25.00	Resistant to bud necrosis, leaf spot.
4.	ICGS 11	25.00	Plants are dwarf with dark green leaves.
5.	TMV 2	16.00	Seed salmon in color spheroidal in shape,

Raw Material Aspects:

Parts of the peanut include:

- **Shell** - outer covering, in contact with dirt.
- **Cotyledons (two)** - main edible part.
- **Seed coat** - brown paper-like covering of the edible part
- **Radicle** - embryonic root at the bottom of the cotyledon, which can be snapped off.
- **Plumule** - embryonic shoot emerging from the top of the radicle.



Source of Raw Material:

- World production of groundnut reached a record of about 21 million tonnes.
- The most important groundnut-producing countries in the world are India, China, the USA, West Africa, Sudan, and Nigeria, etc.
- India ranks first in the world in area 8.5 million hectares contributes about 40 % of the total world's area.
- it occupies an area of 5.86 m ha with 8.26 m tons production.
- The main groundnut growing states are Gujarat, Tamil Nadu, Andhra Pradesh, Maharashtra, Karnataka, and Rajasthan.



Technologies:

Single Stage (Traditional method)

- Traditionally, peanut butter is produced by single-stage grinding.
- Initially, roasted peanuts are coarsely ground using typical grinding machines such as appropriate grinder machines.



Technologies:

Modern Method (Double stage)

- Commercially, peanut butter is produced by a two steps size reduction process; grinding and homogenizing.
- Initially, roasted peanuts are coarsely ground using typical grinding machines such as colloid mills, attrition mills, disintegrators, and hammer mills.
- However, to obtain finer grinding output, the paste would then be ground several times which could heat up the peanut butter to excessively high temperatures.



Manufacturing Process:



Raw material

- Raw materials are procured from the local vendor.
- All raw materials are placed in the inventory
- Peanuts are brought from raw material inventory into sorting area



Shorting and grading

- Shelled peanuts are graded according to sizes.
- Peanuts are manually sorted here, to remove bad peanuts.
- To obtain a good quality product only big or bold peanuts are taken up for the processing.

Manufacturing Process:

Roasting

- Roasting is done at around 160 °C for around 45 minutes depending upon the moisture in peanuts.
- This reduces water content to 1% which increases the shelf life and helps develop flavor.
- Roasted Peanuts are now allowed to cool down in air



Manufacturing Process:

Grinding

- These peanuts are then fed to peanut butter grinder machine
- It essentially grinds peanuts in multiple steps to required paste
- The first reduce the nuts to a medium grind and the second to a fine size and smooth texture.
- Other ingredients such as salt, sugar, and stabilizers can be added during this process



Manufacturing Process:



Filling and Packing

- The stabilized peanut butter is automatically packed in jars, capped and labeled.
- Since proper packaging is the main factor in reducing oxidation, manufacturers use vacuum packing.





PROCESS & MACHINERY REQUIREMENT

Flow Chart:

Machine and Equipments	Description	Machine Image
Peanut Roasting Machine:	<ul style="list-style-type: none"> ➤ It's a machine used to roast peanuts efficiently. ➤ Can also be used for several other nuts like cashew & almond. ➤ It's composed of a rotating drum & heater arrangement. ➤ Heaters are located in periphery of drum & provide heat required for heating. 	
Peanut Butter Grinder	<ul style="list-style-type: none"> ➤ It's an industrial grinder class machine used to grind peanuts. ➤ It grinds peanuts into a thick paste or peanut butter. ➤ Machine usually perform this task in two or more stages. ➤ Multi-Stage Type Machine provide finer control over consistency 	


PROCESS & MACHINERY REQUIREMENT

Flow Chart:

Machine and Equipments	Description	Machine Image
<p>Food Paste Filling Machine</p>	<ul style="list-style-type: none"> ➤ Used to fill paste in given containers. ➤ Can have multiple or single filling head. ➤ Composed of a holding tank, nozzle, pump & control system. ➤ Most machines also have inbuilt machine conveyor. 	
<p>Jar Capping Machine</p>	<ul style="list-style-type: none"> ➤ It's a machine designed to cap filled jars. ➤ Automated versions use vacuum attachment. ➤ It's composed of a torqueing arrangement to cap jars. ➤ Most machines also have inbuilt machine conveyor. 	

PROCESS & MACHINERY REQUIREMENT

Additional Machine & Equipment:

Machine and Equipments	Used	Machine Image
Weighing machine	Used for weighing the raw material and ingredients	
Food Grade Conveyor	These are conveyors with food grade belt to maintain food safety standards set by monitoring authorities.	

Process & Machinery Requirement

General Failures & Remedies:

S. No.	General Failures	Remedies
1.	Ball bearing failure of various machine	<ul style="list-style-type: none"> ➤ Proper periodic lubrication of all bearings in various machines. ➤ Regular replacement of all bearing to prevent critical failures.
2.	Power Drive Overload	<ul style="list-style-type: none"> ➤ Ensure proper weighing & metering specially in case of semi-automatic plant. ➤ Install warning sensor in buffer region of loading capacity to ensure efficient operation.
3.	Mechanical Key Failure	<ul style="list-style-type: none"> ➤ Ensure that mechanical keys are replaced as per there pre-defined operational life. ➤ Prevent Overloading.

Cont..

Process & Machinery Requirement

General Failures & Remedies:

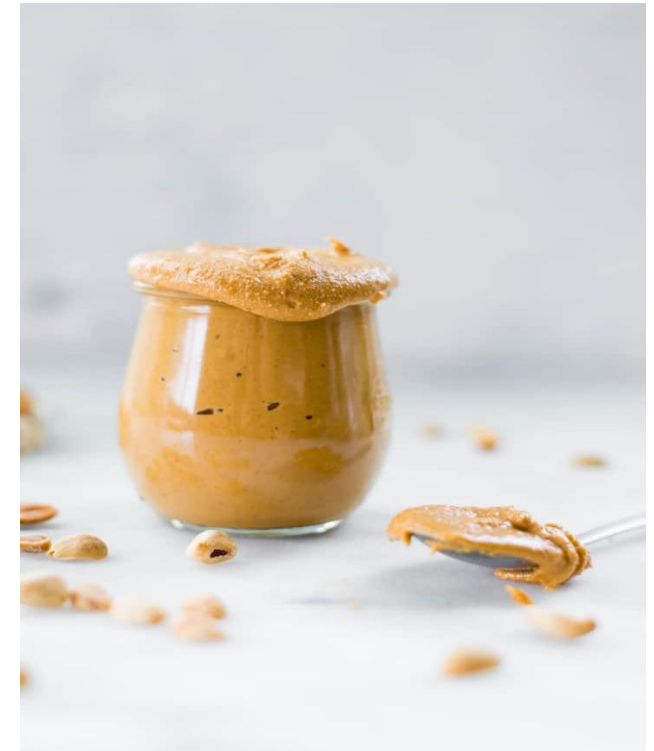
S. No.	General Failures	Remedies
4.	Loss of Interface	<ul style="list-style-type: none"> ➤ This problem is dominant in newly established automatic plant, one must learn to maintain rules in plant & ensure no employee goes near transmission lines, unless authorised. ➤ Provide proper physical shielding for the connections.
5	Improper Sieving (Optical Sorters)	<ul style="list-style-type: none"> ➤ This problem fundamentally occurs due problem with optical sensors. ➤ The solution involves cleaning the optical surface & if problem persists replacing the sensor.

Nutritional Information:

Peanuts are rich in protein, fat, and various healthy nutrients.

100 Gram of peanut contains:

1.	Calories	567
2.	Water	7%
3.	Carbs	25.8 grams
4.	Sugar	16.1 grams
5.	Fiber	4.7 grams
6.	Fat:	8.5 grams
7.	Saturated	49.2 grams
8.	Monounsaturated	6.28 grams
9.	Polyunsaturated	24.43 grams
10.	Omega-3	15.56 grams
11.	Omega-6	0 grams
12.	Trans	15.56 grams
13.	Calories	0 grams



Export Potential & Sales Aspect:



- Peanut butter is made from dry roasted peanuts.
- it is popular in many countries and flex premium peanut butter is considered as the best peanut better
- Peanut butter market is anticipated to dominate the market with a market value of USD 4.20 billion in 2019.
- it is expected to grow with a growth rate of 6.10% in the forecast period of 2020 to 2027.

The objectives of the scheme are:

- Support for capital investment for up-gradation and formalization with registration for GST, FSSAI hygiene standards and Udyog Aadhar;
- Capacity building through skill training, imparting technical knowledge on food safety, standards & hygiene and quality improvement;
- Hand holding support for preparation of DPR, availing bank loan and up-gradation;
- Support to Farmer Producer Organizations (FPOs), Self Help Groups (SHGs), producers cooperatives for capital investment, common infrastructure and support branding and marketing.
- <https://mofpi.nic.in/pmfme/docs/SchemeBrochure1.pdf>



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