MINISTRY OF FOOD PROCESSING INDUSTRIES
GOVERNMENT OF INDIA

# GROUNDNUT PROCESSING

**AATMANIRBHAR BHARAT**

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

# INTRODUCTION

- Groundnut (*Arachis hypogeal linn)*
- Family Leguminosae and subfamily pappillonaceae.
- Rich nutty flavor , sweet taste , crunchy feel
- Longer shelf life over oilseeds
- Largest crop of oil seeds
- **Major Growing States:**

  Gujarat, Andhra Pradesh, Tamil Nadu, Karnataka, Maharashtra, Rajasthan, Madhya Pradesh, Orissa, and Uttar Pradesh. (apeda)

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# NUTRITION

| Principle | Nutrient value | Percentage of RDA |
|---|---|---|
| Energy | 567 Kcal | 29 |
| Carbohydrate | 16.13g | 12 |
| Protein | 25.80g | 46 |
| Total fat | 49.24g | 165 |
| Cholesterol | 0 | 0 |
| Dietary fibre | 8.5g | 22 |

(USDA , national nutrition basis)

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# VARIETIES

Tag 24 : bunchy type, mature in 110 days . The average yield is 25 q / ha. A shelling percentage is 72 %. Oil content is 53%. Resistant to bud necrosis and leaf spot .

ICGS 11 : bunchy type, mature in 125 days. The average yield is 25 q / ha. A shelling percentage is 70 %. Oil content is 53%. Plants are dwarf with dark green leaves.

TMV 2 : bunchy type, mature in 115 days.The average yield is 16 q / ha. A shelling percentage is 70 %. Oil content is 51%. Moderately resistant to early, late leaf spot and rust dormancy absent.

# VARIETIES

AK12 – 24 : bunchy type, mature in 105 days. The average yield is 16 q / ha. A shelling percentage is 70 %. Oil content is 48%. Resistant to leaf spot and rust , Seeds rosy in colour having no dormancy.

OG52 -1 : bunchy type, mature in 110 days. The average yield is 25 q / ha. A shelling percentage is 72 %. Oil content is 51%. Kernal bold, red in color, resistant to collar rot and stem rot, dormancy absent.
TAG 24: bunchy type, mature in 110 days. The average yield is 25 q / ha. A shelling percentage is 72 %. Oil content is 53%. Resistant to bud necrosis.
(Kisansuvidha)

# PRODUCTION

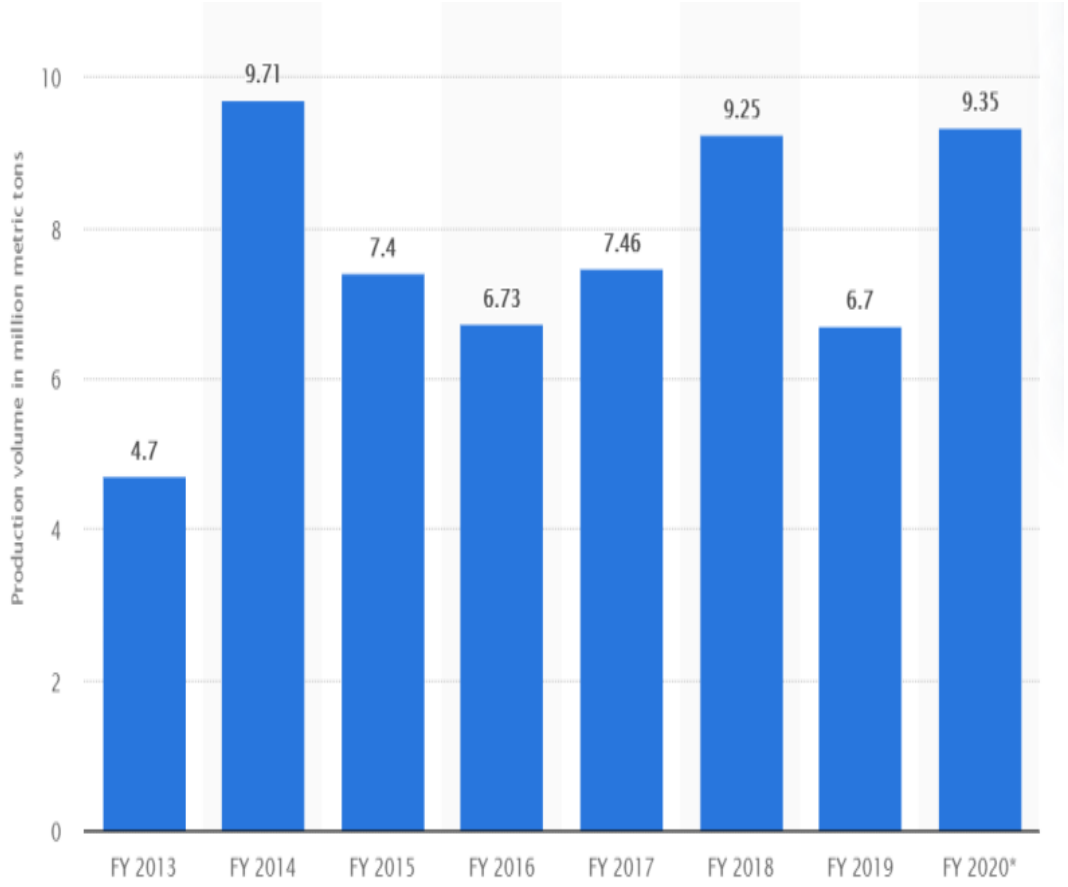
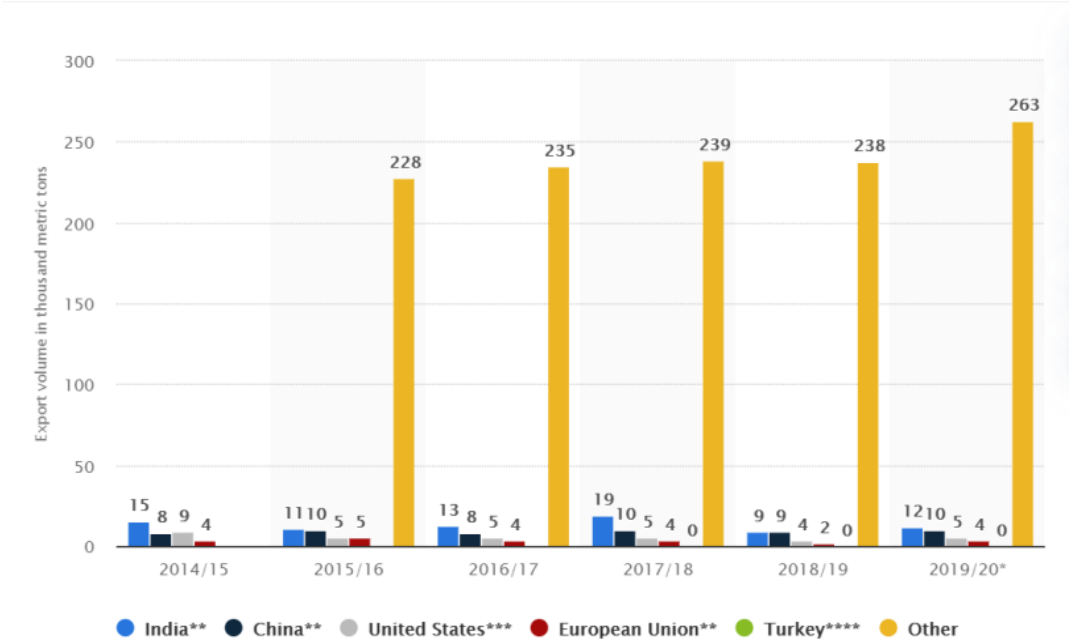



Figure 1.Production volume of groundnut across India from the financial year 2012 to 2019 (in million metric tons)

# EXPORT VOLUME




Export volume of the peanut oil from country to worldwide from 2015 to 2020 (in thousand metric tons)

The country has exported 6,64,442.93 MT of groundnuts to the world for the worth of Rs. 5,096.34 crores/ 711.38 USD Millions during the year 2019-20.

# ANTI NUTRITIOANL FACTORS

- Trypsin inhibitor
- Lectin

# BIOACTIVES

▪**p-Coumaric acid** The main antioxidant in peanuts

▪**Resveratrol.** a powerful antioxidant helps in reducing cardiovascular disease and cancer

▪**Isoflavones.** class of polyphenols associated with much health effects

▪**Phytic acid.** Delibilate the absorption of fe and zinc

▪**Phytosterols.** Delibilate the absorption of cholesterol in the digestive tract .

(TNAU Agritech portal)

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# PRE –PROCESSING STEPS

# ISI SPECIFICATION FOR GROUNDNUT KERNELS FOR OIL MILLING

| Characteristics | Requirement for milling | | |
|---|---|---|---|
| Damaged kernals and weevil kernals by %by weight (max) | 1 | 2 | 3 |
| Split and broken kernals% by weight | 5 | 10 | 15 |
| Impurities % by weight | 1 | 2 | 3 |
| Moisture content by weight | 6 | 6 | 6 |

# STORAGE

- After the commercial analysis of the various conditions of storage of groundnut particularly in India , there are some recommendations put forward as :
- The products which are expected to be stored, must be dried to a maximum of 5% moisture content.
- It is better to store as pods than as kernels.
- The caking up of the kernels and devastation of the gunny bags can be avoided by using dry sand bedding to a depth of about 1 foot covered by hessa cloth rather than storing in hard floor/bedding materials.
- Bins are the best choices for storage
- Miniature warehouses with natural ventilation and semi-underground storage can be utilized. (fao)

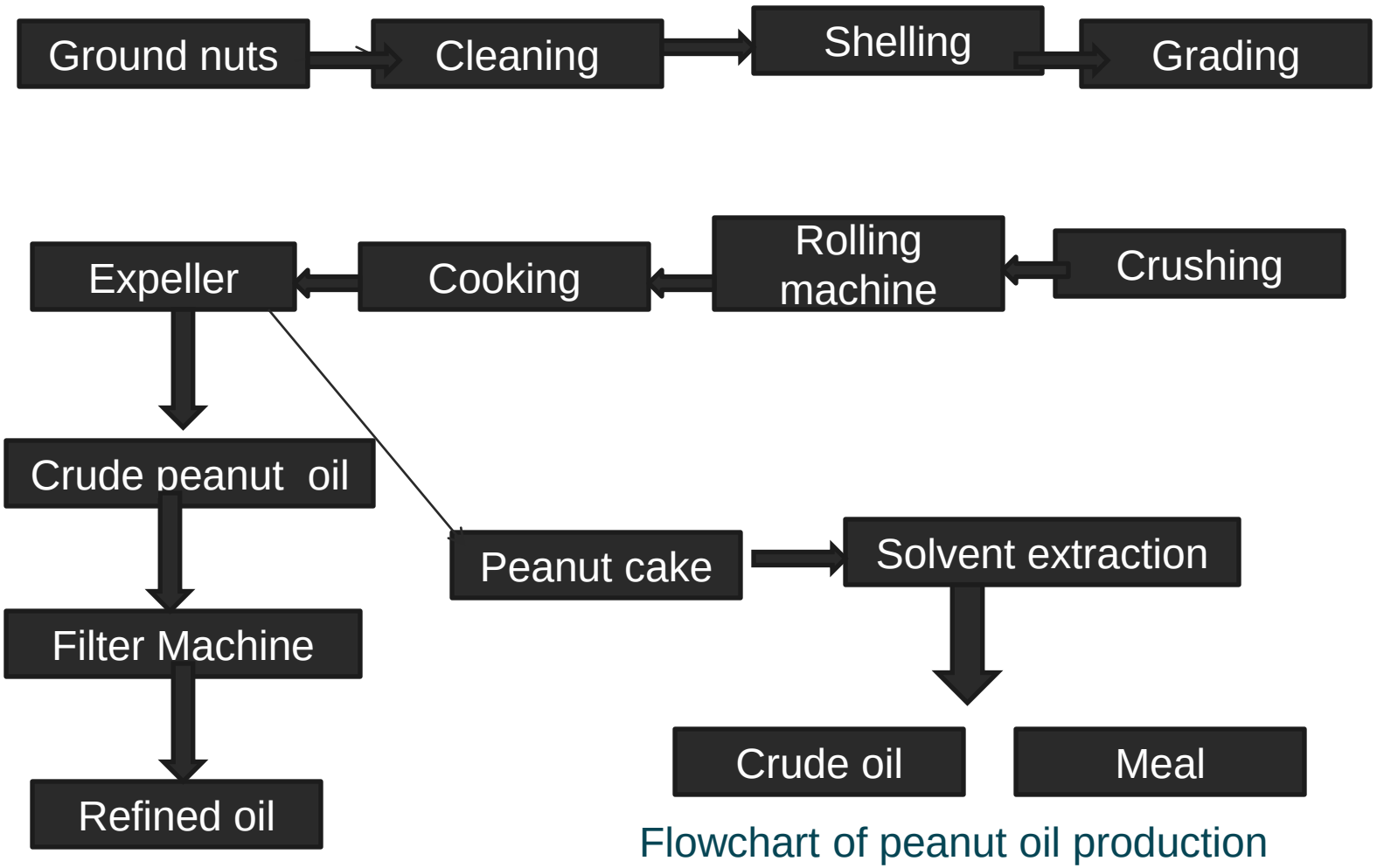
# MAJOR PRODUCTS

- Roasted peanut
- Peanut butter
- Groundnut oil

# OTHER PRODUCTS

- Salted groundnut
- Groundnut milk
- Groundnut bar

# PEANUT OIL




Flowchart of peanut oil production ( agrifarming)

# EQUIPMENTS

- GHANI - EXPELLLER BY PRESSING - double Ghani capacity of 560 kg / day.
- BABY EXPELLERS MILLS – capacity of 350 – 450 k / day .
- SOLVENT EXTRACTION - Range of production - 50 – 200 tonns /day.
- FILTER PRESS – Chamber filter press with 10 – 15 plates can be used .

# EQUIPMENTS

Vibratory Pre-cleaner machine

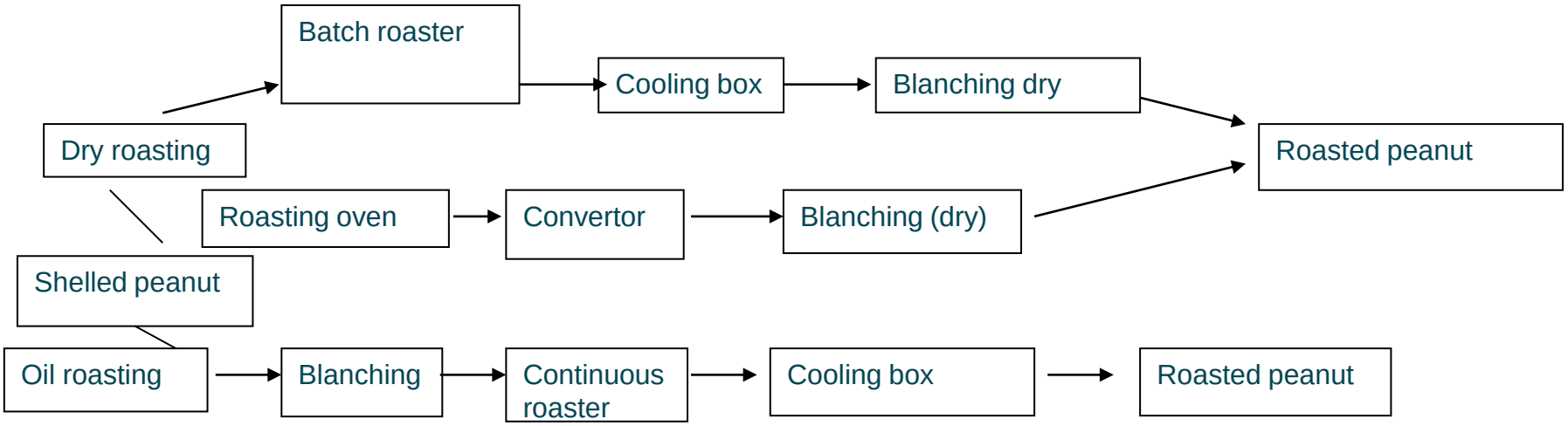
Decorticator Machine

Cross Tube Boiler

# ROASTED PEANUT

- Batch process
- Rotating furnace – drum shaped – 430 °C.
- Roasting for 40 – 60 min .
- Groundnut temperature reaches (160 °C).
- Blanching is done to loosen the skin .
- Roasting of kernels at temperature of 90°C and 110°C -under roasted
- Temperature of 150°c for 60min and 170°c for 45 and 60 min - over-roasted .

# ROASTED PEANUT



# ROASTED PEANUT

Pan roaster

Automatic seasoning system

# PEANUT BUTTER

Oil Expeller


Oil Filter Press

Bottle Filter machine


Screw Conveyer

Collection Tank

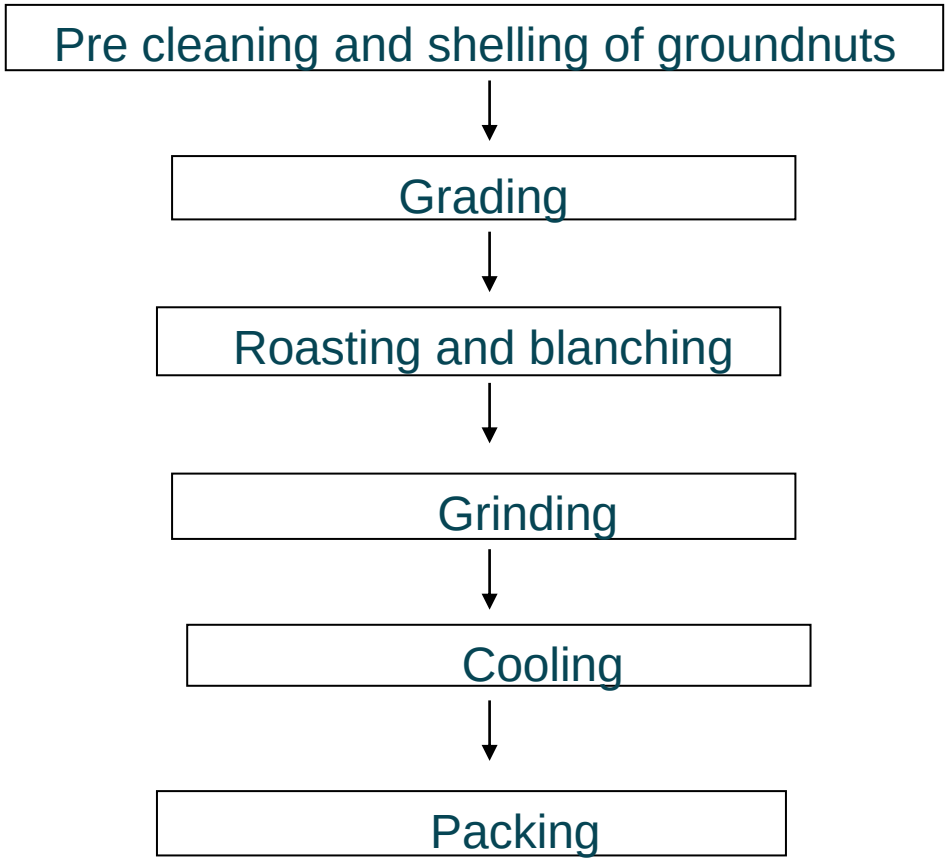
# SALTED GROUNDNUT

- Soaking the groundnut kernels in water( 4 % NaCl) for 12 hours .
- Soaked kernels are dried and roasted with sand.
- Skin is peeled off and packed

# PEANUT BUTTER

- Pre cleaning and shelling
- Grading
- Roasting ( 1600 ℃) for 40 – 60 min
- Grinding ( Ingredients salt (2 %), sugar and stabilizer added ,outlet temperature is 65 – 75℃)
- De aeration – cooling by scraped surface heat exchanger
- Filling and packaging (metal drums / PET jars)
- Jars are placed for 35 – 40 hours at 20 ℃ - Settling

# FLOWCHART OF THE PROCESSING OF PEANUT BUTTER



# PEANUT BUTTER

Peanut Roasting Machine

Peanut Grinder

Food Paste Filling Machine

Jar Capping Machine

# BYPRODUCT UTILIZATION

- **Peanut** meal. Most peanuts grown in world are primarily used to produce edible oil.
- **Peanut** skin. The kernels are used to make **peanut** butter, roasted snack peanuts, **peanut** confections, and **peanut** oil.
- **Peanut** hull.
- **Peanut** vine.
- The by-products of peanut contain many functional compounds, such as protein, fiber and polyphenolics, which can be incorporated into processed foods to serve as functional ingredients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