**UNIT :- 5 OILS AND FATS**

1. Oils and fats form an important part of a diet.  2. Fatty acids are a component of dietary fats that are necessary for vital functions in our bodies. 3. Fats are solid or semi – solid at ordinary temperature, whereas oils are usually in a liquid state. 4. Edible fats and oils are so much in demand, So government of various countries are paying attention in finding out new sources of vegetables oils. **FAT** 1. They are the chemically esters of fatty acids and a trihydric alcohol. 2. The fats contain stearic or palmitic acid and the oil contain oleic acid. 3. They are actually colourless and tasteless, but the colour and taste may develop due to the presence of traces of essential oils or pigments. 4. If stored for long and at high temperature, they break into various aldehydes, ketones etc. and develop unpleasant taste and smell. **OIL**  1. Oil is produced by the pressing or crushing of fruit. 2. It comes in different grades, depending on the amount of processing involved. 3. These are of unrefined (virgin) grades and refined grades. 4. The less the oil is refined by heat and chemical treatments, the higher the quality of the oil.

**CLASSIFICATION OF OILS AND FATS** Oils and fats are classified into four types :- I. VEGETABLE FATS II. DRYING OILS III. SEMI – DRYING OILS IV. NON – DRYING OILS

**I. VEGETABLE FATS** :- 1. They are solid or semi – solid at ordinary temperature. 2. They include Coconut oil, Palm oil etc.

**II. DRYING OILS** :- 1. They harden into elastic films on exposure to air. 2. They include Linseed oil, Walnut oil, Soyabean oil etc.

**III. SEMI – DRYING OILS** :- 1. They form soft solid films only after long exposure to air. 2. They include Cottonseed oil, Corn oil, Sunflower oil, Mustard oil etc.

**IV. NON – DRYING OILS** :- 1. They do not form solid films on exposure to air. 2. They include Olive oil, Castor oil, Groundnut oil etc.

**EXTRACTION OF OILS AND FATS** 1. The fatty acids are insoluble in water and are present in form of insoluble droplets or deposits within cells. 2. Most oils are stored in seeds but they may be found in fruits, stems, tubers etc. 3. Extraction of oil takes place by separation of kernels from the seed coats. 4. The oil are removed from the kernels in the mill by passing with several process.

**USES OF FATS AND OILS** :- 1. The Coconut oil, Soyabean oil, Cottonseed oil, Mustard oil and Groundnut oil are well known edible oils and are widely used for cooking. 2. Some other oils are used for body and hairs. 3. Oils are extensively used for manufacturing soaps and candles. 4. They are also used in preparing paints, varnishes, furnitures, leather polishes, oil papers, putty, laxatives (medicine), lubricants, cosmetics, waterproof fabrics, inks, oil cloth etc.

**GROUNDNUT (PEANUT)** Vernacular name :- Moongphali, Badam Botanical name :- Arachishypogaea **CLASSIFICATION** Class :- Eudicots Order :- Fabales Family :- [Fabaceae](https://en.wikipedia.org/wiki/Fabaceae) / Leguminosae Genus :- Arachis species :- hypogaea

1. It is a [legume](https://en.wikipedia.org/wiki/Legume) [crop](https://en.wikipedia.org/wiki/Crop) grown mainly for its edible seeds. 2. It is a highly nutritious legume crop. 3. The high oil content of the seed has made groundnut an important oil yielding crop. 4. It has many other local names, Such as earthnuts, goober peas, monkey nuts, pygmy nuts and pig nuts. 5. Its pods (fruits) develop underground. 6. It is a [nitrogen – fixing](https://en.wikipedia.org/wiki/Nitrogen_fixation) bacteria in [root nodules](https://en.wikipedia.org/wiki/Root_nodule). 7. India is the largest producer of groundnuts in the world.

**DISTRIBUTION/OCCURRENCE** 1. The groundnut was probably first cultivated in the valleys of Paraguay and Brazil. 2. It is widely grown in the [tropics](https://en.wikipedia.org/wiki/Tropics) and subtropics regions. 3. There are many peanut [cultivars](https://en.wikipedia.org/wiki/Cultivar) grown around the world. 4. The chief groundnut growing countries are China, India, United States, [Nigeria](https://en.wikipedia.org/wiki/Nigeria), [Myanmar](https://en.wikipedia.org/wiki/Myanmar), [Sudan](https://en.wikipedia.org/wiki/Sudan), Indonesia, Philippines, Vietnam, Malaysia, Africa, Polland, France, Europe, West Indies, Mexico and Thailand. 5. Groundnuts in India are available throughout the year. 6. The major groundnut growing states in India are Gujarat, Andhra Pradesh, Tamil Nadu, Karnataka, Maharashtra ,Rajasthan, Madhya Pradesh, Orissa, and Uttar Pradesh.

**NUTRITION** 1. They are rich in [essential nutrients](https://en.wikipedia.org/wiki/Essential_nutrients) and edible oil . 2. They are an excellent source of several [vitamins](https://en.wikipedia.org/wiki/B_vitamins), several [dietary minerals](https://en.wikipedia.org/wiki/Dietary_minerals), such as [manganese](https://en.wikipedia.org/wiki/Manganese), [magnesium](https://en.wikipedia.org/wiki/Magnesium), copper and [phosphorus](https://en.wikipedia.org/wiki/Phosphorus) and [dietary fiber](https://en.wikipedia.org/wiki/Dietary_fiber). 3. They also contain protein and amino acid . 4. It also has [polyunsaturated](https://en.wikipedia.org/wiki/Polyunsaturated_fat), [monounsaturated](https://en.wikipedia.org/wiki/Monounsaturated_fat) [fats](https://en.wikipedia.org/wiki/Fat), and [phytosterols](https://en.wikipedia.org/wiki/Phytosterol) [dietary fiber](https://en.wikipedia.org/wiki/Dietary_fiber). The seeds are rich in fatty acids.

**BOTANICAL DESCRIPTION/STRUCTURE** 1. It is an [annual](https://en.wikipedia.org/wiki/Annual_plant) [herbaceous](https://en.wikipedia.org/wiki/Herbaceous) plant. 2. The plant is bushy with the branches trailing on the ground.

**Root** :- 1. It has a tap root. 2. The tap roots are elongated, fairly straight, and slender.



**Stem** :- 1. The central stem is more or less upright. 2. The prostrate or the sub – erect branches grows 30 – 50 cm. (1.0 – 1.6 ft) tall. **Leaves** :- 1. The [leaves](https://en.wikipedia.org/wiki/Leaf%22%20%5Co%20%22Leaf) are [opposite](https://en.wikipedia.org/wiki/Opposite_leaves) and [pinnate](https://en.wikipedia.org/wiki/Pinnate) compound. 2. The compound leaves are with four leaflets (quadrifoliate). 3. Each leaflet is 1 – 7 cm. long and 1 – 3 cm. across. 4. They bear large stipules. **Inflorescence/Flower** :- 1. Groundnuts are peculiar in that the flowers are small air borne, but after pollination the long pedicels of the flower enters in the soil. 2. The flowers are 1.0 – 1.5 cm. across, and yellowish orange with reddish veining. 3. They are borne in [axillary](https://en.wikipedia.org/wiki/Axillary_bud) clusters on the stems above ground, and last for just one day. **Fruit (pod)** :- 1. It is simple, dry and dehiscent. 2. Its pods (fruits) develop underground. 3. Pods are 3 – 7 cm. long, normally containing 1 – 4 [seeds](https://en.wikipedia.org/wiki/Seed). 4. It is oblong, pale straw colour. 5. It varies in size according to varieties. **Seed** :- 1. It is covered by a thin papery brownish or reddish membrane. 2. The seed has two cotyledons.

**CULTIVATION/PLANTING** 1. It is a rainfed kharif crop. 2. It is generally sown from April – May to June – July depending upon monsoon rains. 3. In some areas an irrigated crop is grown between January – March and May – July as a rabi crop (South India). 4. The field is ploughed 3 – 4 times followed by harrow till a fine tilth is obtained. 5. The seeds are generally sown after shelled, but sometimes unshelled pods having only one seed are selected for sowing. 6. The method of planting varies in different regions. 7. In some areas, the seed is drilled and in some areas the seed is dropped in the furrow opened by the plough. 8. The seeds in the plough are covered by plankers . 9. The spacing of sown seeds should be about the distance of 1 Ft. from plant to plant and the spacing between the lines is 5 – 9 inches. 10. They become mature in about two months. 11. After maturation, the leaves of the plants turn yellow and the lower leaves sheds. 12. The minerals such as phosphorus, potassium, calcium, magnesium, and micronutrients are also necessary for good yields. 13. The plants continue to produce flowers when pods are developing, therefore even when they are ready for harvest, some pods are immature. 14. The 15 – 30 % and 15 – 50 % yields can be increased in summer and kharif cultivation of groundnut by inoculating the seeds.

**HARVESTING** 1. Groundnut is harvested when fully ripe. 2. If harvested before, there is a high percentage of fatty acid, which has not been converted into oil yet. 3. Depending on growing conditions harvesting is usually 90 – 130 days after planting. 4. For harvesting, the entire plant, including most of the roots is removed from the soil . 5. The bunch variety is harvested by pulling out the plants and the spreading variety is harvested after loosening the soil by digging, ploughing or by light irrigation. 6. The groundnuts are dried slowly over a period of 3 – 4 days. 7. After 3 – 6 weeks the dried groundnut are [threshed](https://en.wikipedia.org/wiki/Threshing) and removed the pods from the plants and dried in the sun for storage. 8. Due to a two-crop cycle it is harvested in March and October.

**ECOLOGICAL FACTOR Climate** :- 1. It is widely grown in the [tropics](https://en.wikipedia.org/wiki/Tropics) and subtropics regions. 2. It need warm weather throughout the growing season for better development. 3. The plant requires a certain amount moisture. 4. The excess of water is harmful for growth. 5. They can grow with as little as 350 mm. of water, but for best yields needs 500mm. 6. In India grown mostly under rain-fed conditions. 7. The plant cannot bear frost or long severe drought or water stagnation. 8. During its ripening period, there should be about a month of warm dry weather. 9. The plant grows best where the temperature is from 70\* – 80\* F. 10. Lower temperature are not suitable for its development. 11. An optimum soil temperature for good germination is 30\* C. 12. Low temperature at sowing delay germination and increases seed and seedling disease. **Soil** :- 1. It grows best in light soil with a pH of 5.9 – 7. 2. Sandy, loam and well drained black soil are best for the crop. 3. It spreads very rapidly in the black cotton soil areas, where it is being used as a rotation fo r cotton. 4. It develops best on well manure and rich in organic matter soil.

 **SOME VARIETIES OF GROUNDNUT**  1. Bhabha Atomic Research Center (BARC) has developed several varieties. 2. Indian groundnuts are available in different varieties Bold or Runner, Java or Spanish and Red Natal. 3. The main Groundnut varieties produced in India are Kadiri-2, Kadiri-3, BG-1, BG-2, Kuber , GAUG-1, GAUG-10, PG-1 , T-28, T-64, TG – 1, TG – 3, TG – 18, Chandra, Chitra, Kaushal, Parkash, Amber etc.

**USES** 1. The [boiled groundnuts](https://en.wikipedia.org/wiki/Boiled_peanuts) are a popular snack in India, China, West Africa, and the southern United States. 2. [Its oil](https://en.wikipedia.org/wiki/Peanut_oil) is often used in cooking. 3. Its butter is a food [paste](https://en.wikipedia.org/wiki/Paste_%28food%29). 4. Its butter is served as a spread on bread, toast or crackers, and used to make sandwiches. 5. The crop is used as rotation crop. 6. The plant tops and crop residues can be used for [hay](https://en.wikipedia.org/wiki/Hay). 7. Groundnut cake is a livestock feed, mostly used by cattle as protein supplements. 8. It have a variety of industrial uses. 9. The groundnut oil are used to made Paint, varnish, lubricating oil, leather dressings, furniture polish, insecticides etc. 10. Its shells are used in the manufacture of plastic, wallboard, abrasives, fuel, paper, and [mucilage](https://en.wikipedia.org/wiki/Mucilage) (glue). 11. The groundnut protein is used in the manufacture of synthetic fibre called ardil.

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