

Processing of Oilseeds

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What are Oilseeds?

- Oilseeds are seeds in which oil can be extracted from. The seeds are crushed to obtain oil for human consumption, biodiesel/fuel production and the remainder is processed into meal which is used as high protein livestock and poultry feed.

Major oilseeds grown in India:

- Groundnut, soyabean, mustard seed, sunflower, sesame, safflower, castor, niger, linseed.
- Groundnut, soyabean and rapeseed-mustard account for about 88% of the total production of oilseeds in India

- In a balanced diet, the oils and fats requirement per person per day is 35 g for vegetarians, 39 g for non-vegetarian and 38 g for average diet.
- Oilseeds and animals are the main sources of fat.
- The major responsibility of oil production in India, both for edible and industrial usages depends on vegetable oil seeds production.
- India accounts 10 percent of the total global output of the vegetable oils and fats.
- The difference between an oil and a fat is that an oil is usually liquid at ambient temperature while a fat is solid.

- For processing of oilseeds and oil bearing materials, India has a large network of oil mills employing more than 10 million people.
- The installed capacity of oil mills is estimated as **35 million tonnes per annum** besides, there is solvent extraction plants of about 6.8 million tonnes per annum capacity in the country.
- Most of our installed capacity of oilseed processing industries are extremely old and inefficient with high consumption of steam and thus have **low recoveries of oil**.
- The quality of the products is also poor and large quantities of oil is left in the oilmeal.
- It is reported that not less than 0.5 million tonnes of oil of the value about 10,000 million Rupees is lost due to improper processing of oilseeds.

MAJOR CONSTRAINTS

- (i) In-efficient processing
- (ii) Inadequate utilization of some oil bearing materials such as rice bran.
- (iii) Unscientific and inadequate storage,
- (iv) Exploitation of oilseed based proteins,
- (V) Inefficient and expensive packaging,
- (vi) Inadequate research and development, and
- (vii) Problems in exporting oilseed materials are the big hurdles in increasing oil yields in this century which need attention.

Seed Oil	(%)	Use
Almond	50	Food, salad oil, soap
Castor	50	Medicine, lubricant
Cotton seed	30	Food, paint, resin
Hemp seed	35	Paint, varnish, soap
Linseed	40	Paint, soap, varnish, linoleum
Olive	40	Salad oil, cooking oil
Peanuts	50	Salad oil, cooking oil
Perilla seed	50	Drying oil for paint, resin
Poppy seed	50	Salad oil, cooking oil
Rape seed	40	Salad oil, cooking oil
Sesame seed	50	Salad oil, cooking oil
Sunflower seed	35	Salad oil, cooking oil, soap

Grades and standards

- Grades and standards for oilseeds, oils and oilcakes are laid down by the directorate of Marketing and Inspection, Government of India.
- Apart from these standards and specifications, these produce also comply with the restrictions in regard to **pesticides/Insecticides residue (Rule 65), poisonous metals (Rules 57), naturally occurring toxic substances (Rule 57-B) and other provisions prescribed under Prevention of Food Adulteration (PFA) Rules, 1955** and as amended time to time

Example: **Soya flour**

- Solvent extracted soya flour means the product obtained from clean, sound and healthy soyabeans by a process of cracking, dehulling, solvent extraction with food grade hexane and grinding.
- It shall be in the form of coarse or fine powder or grits, white to creamy white in colour, of uniform composition and free from rancid and objectionable odour, extraneous matter, insects, fungus, rodent hair and excreta.
- It shall be free from any added colour and flavour.

➤ It shall conform to the some standards

- (a) Moisture - Not more than 9.0%
- (b) Total ash - Not more than 7.2%, dry basis
- (c) Ash insoluble in dilute HCL - Not more than 0.4%, dry basis
- (d) Protein (N*6.25) - Not more than 48%, dry basis
- (e) Crude fibre - Not more than 4.2%, dry basis
- (f) Fat - Not more than 1.5%, dry basis
- (g) Total bacterial count - not more than 50,000/g
- (h) Coliform bacteria - Not more than 10/g
- (i) Salmonella bacteria - Nil in 25g
- (j) Hexane (Food grade) - Not more than 10 ppm

Grade specification for sesame oil

- This oil expressed from clean and sound seeds of til, black, brown, white or mixed.
- It shall be clear, free from rancidity, suspended or other foreign matter, separated water, added colouring or flavouring substances, or mineral oil.
- It shall conform to the following standards:

(a) Refractive index at 40C	- 1.4646-1.4665
(b) Saponification value	- 188 – 193
(c) Iodine value	- 103-120
(d) Unsaponification matter	- Not more than 1.5%
(e) Acid value	- Not more than 6.0%

There are several steps involved in oilseeds processing:

- Harvesting
- Cleaning
- Dehulling
- Drying
- Pre-treatments
- Oil expelling/extraction
- Refining
- Packaging
- Storage and Utilization

Objective: To minimize losses and to sustain or improve the quality of the product