

# Peanut

The **peanut** (***Arachis hypogaea***), also known as the **groundnut**,<sup>[a][2]</sup> **goober** (US),<sup>[3]</sup> **goober pea**,<sup>[4]</sup> **pindar** (US)<sup>[3]</sup> or **monkey nut** (UK), is a legume crop grown mainly for its edible seeds, contained in underground pods. It is widely grown in the tropics and subtropics by small and large commercial producers, both as a grain legume<sup>[5]</sup> and as an oil crop.<sup>[6]</sup> Geocarpy is atypical among legumes, which led botanist Carl Linnaeus to name the species *hypogaea*, from Greek 'under the earth'.

The peanut belongs to the botanical family Fabaceae (or Leguminosae), commonly known as the legume, bean, or pea family.<sup>[1]</sup> Like most other legumes, peanuts harbor symbiotic nitrogen-fixing bacteria in root nodules,<sup>[7]</sup> which improve soil fertility, making them valuable in crop rotations.

Despite not meeting the botanical definition of a nut as "a fruit whose ovary wall becomes hard at maturity",<sup>[8]</sup> peanuts are usually categorized as nuts for culinary purposes and in common English. Some people are allergic to peanuts and can have a potentially fatal reaction; this is distinct from tree nut allergies.

Peanuts are similar in taste and nutritional profile to tree nuts such as walnuts and almonds, and, as a culinary nut, are often served in similar ways in Western cuisines.

## Botanical description

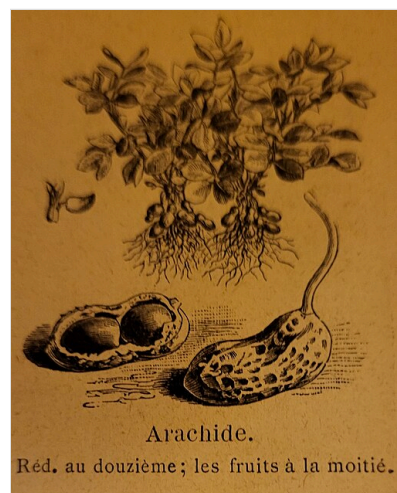


Illustration of a peanut plant and pods with seeds in "Les plantes potagères" Vilmorin Andrieux 1903

The peanut is an annual herbaceous plant growing 30 to 50 centimetres (12 to 20 in) tall.<sup>[9]</sup> As a legume, it belongs to the botanical family Fabaceae, also known as Leguminosae, and commonly known as the legume, bean, or pea family.<sup>[1]</sup> Like most other legumes, peanuts harbor symbiotic nitrogen-fixing bacteria in their root nodules.<sup>[7]</sup>

The leaves are opposite and pinnate with four leaflets (two opposite pairs; no terminal leaflet); each leaflet is 1 to 7 cm ( $\frac{1}{2}$  to  $2\frac{3}{4}$  in) long and 1 to 3 cm ( $\frac{1}{2}$  to  $1\frac{1}{4}$  in) across. Like those of many other legumes, the leaves are nyctinastic; that is, they have "sleep" movements, closing at night.<sup>[10]</sup>

The flowers are 1 to 1.5 cm ( $\frac{3}{8}$  to  $\frac{5}{8}$  in) across, and yellowish orange with reddish veining.<sup>[11][9]</sup> They are borne in axillary clusters on the stems above ground and last for just one day. The ovary is


located at the base of what appears to be the flower stem but is a highly elongated floral cup.

Peanut fruits develop underground, an unusual feature known as geocarpy.<sup>[12]</sup> After fertilization, a short stalk at the base of the ovary—often termed a gynophore, but which appears to be part of the ovary—elongates to form a thread-like structure known as a "peg". This peg grows into the soil, allowing the fruit to develop underground.<sup>[12]</sup> These pods, technically called legumes, are 3 to 7 centimetres (1 to 3 in) long, normally containing one to four seeds.<sup>[11][9]</sup> The shell of the peanut fruit consists primarily of a mesocarp with several large veins traversing its length.<sup>[12]</sup>

Parts of the peanut include:

- Shell – outer covering, in contact with soil
- Cotyledons (two) – the 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

**Peanut**



**Scientific classification**

Kingdom: Plantae

Clade: Tracheophytes

Clade: Angiosperms

Clade: Eudicots

Clade: Rosids

Order: Fabales

Family: Fabaceae

Subfamily: Faboideae

Genus: Arachis

Species: **A. hypogaea**

**Binomial name**

**Arachis hypogaea**

L.

**Subspecies and varieties**

- subsp. fastigiata Waldron
  - var. aequatoriana Krapov. & W. C. Greg
  - var. fastigiata (Waldron) Krapov. & W. C. Greg
  - var. peruviana Krapov. & W. C. Greg
  - var. vulgaris Harz
- subsp. hypogaea L.
  - var. hirsuta J. Kohler
  - var. hypogaea L.

**Synonyms**<sup>[1]</sup>

*Arachis nambyquarae* Hoehne

*Lathyrus esquirelii* H. Lév.

- Plumule – embryonic shoot emerging from the top of the radicle

## Phytochemistry

Peanuts contain polyphenols, polyunsaturated and monounsaturated fats, phytosterols, and dietary fiber in amounts similar to several tree nuts.<sup>[13]</sup> Peanut skins contain resveratrol.<sup>[14]</sup>

## History

The *Arachis* genus is native to South America, east of the Andes, around Peru, Bolivia, Argentina, and Brazil.<sup>[15]</sup> Cultivated peanuts (*A. hypogaea*) arose from a hybrid between two wild species of peanut, thought to be *A. duranensis* and *A. ipaensis*.<sup>[15][16][17]</sup> The initial hybrid would have been sterile, but spontaneous chromosome doubling restored its fertility, forming what is termed an amphidiploid or allotetraploid.<sup>[15]</sup> Genetic analysis suggests the hybridization may have occurred only once and gave rise to *A. monticola*, a wild form of peanut that occurs in a few limited locations in northwestern Argentina, or in southeastern Bolivia, where the peanut landraces with the most wild-like features are grown today,<sup>[11]</sup> and by artificial selection to *A. hypogaea*.<sup>[15][16]</sup>

The process of domestication through artificial selection made *A. hypogaea* dramatically different from its wild relatives. The domesticated plants are bushier, more compact, and have a different pod structure and larger seeds. From this center of origin, cultivation spread and formed secondary and tertiary centers of diversity in Peru, Ecuador, Brazil, Paraguay, and Uruguay. Over time, thousands of peanut landraces evolved; these are classified into six botanical varieties and two subspecies (as listed in the peanut scientific classification table). Subspecies *A. h. fastigiata* types are more upright in their growth habit and have shorter crop cycles. Subspecies *A. h. hypogaea* types spread more on the ground and have longer crop cycles.<sup>[11]</sup>

The oldest known archeological remains of pods have been dated at about 7,600 years old, possibly a wild species that was in cultivation, or *A. hypogaea* in the early phase of domestication.<sup>[18]</sup> They were found in Peru, where dry climatic conditions are favorable for the preservation of organic material. Almost certainly, peanut cultivation predated this at the center of origin where the climate is moister. Many pre-Columbian cultures, such as the Moche, depicted peanuts in their art.<sup>[19]</sup> Cultivation was well-established in Mesoamerica before the Spanish arrived. There, the conquistadors found the *tlālcacahuatl* (the plant's Nahuatl name, hence the name in Spanish *cacahuate*) offered for sale in the marketplace of Tenochtitlan. Its cultivation was introduced in Europe in the 19th century through Spain, particularly Valencia, where it is still produced, albeit marginally.<sup>[20]</sup> European traders later spread the peanut worldwide, and cultivation is now widespread in tropical and subtropical regions. In West Africa, it substantially replaced a crop plant from the same family, the Bambara groundnut, whose seed pods also develop underground.<sup>[21]</sup> In China and India, it became an agricultural mainstay, and these countries are the largest producers in the world (*Production* section).

Peanuts were introduced to the US during the colonial period and grown as a garden crop.<sup>[22][9]</sup> Starting in 1870, they were used as an animal feedstock until human consumption grew in the 1930s.<sup>[9]</sup> George Washington Carver (1864–1943) championed the peanut as part of his efforts for agricultural extension in the American South, where soils were depleted after repeated plantings of cotton. He invented and promulgated hundreds of peanut-based products, including cosmetics, paints, plastics, gasoline and nitroglycerin.<sup>[23]</sup>

Peanut butter was first manufactured in Canada by a process patented in the US in 1884 by Marcellus Gilmore Edson of Montreal.<sup>[24]</sup> Peanut butter became well known in the United States after the Beech-Nut company began selling it at the St. Louis World's Fair in 1904.<sup>[25]</sup> The US Department of Agriculture initiated a program to encourage agricultural production and human consumption of peanuts in the late 19th and early 20th centuries.<sup>[9]</sup>

## Varieties

### Cultivars in the United States

There are many peanut cultivars grown around the world. The market classes grown in the United States are Spanish, Runner, Virginia, and Valencia.<sup>[26]</sup> Peanuts are produced three major areas of the US: the southeastern US region which includes Alabama, Georgia, and Florida; the southwestern US region which includes New Mexico, Oklahoma, and Texas; and in the



Peanut flower

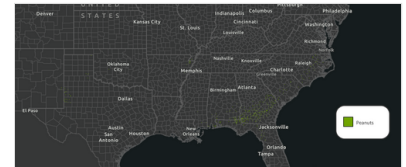


Peanut seed separated showing the cotyledon, plumule and radicle



Peanuts

general eastern US which includes Virginia, North Carolina, and South Carolina.<sup>[26]</sup> In Georgia, Naomi Chapman Woodroof is responsible for developing the breeding program of peanuts, resulting in a harvest almost five times greater.<sup>[27]</sup>



Peanut fields in the United States

Certain cultivar groups are preferred for particular characteristics, such as differences in flavor, oil content, size, shape, and disease resistance.<sup>[28]</sup> Most peanuts marketed in the shell are of the Virginia type, along with some Valencias selected for large size and the attractive appearance of the shell. Spanish peanuts are used mostly for peanut candy, salted nuts, and peanut butter.

### Spanish group

The small Spanish types are grown in South Africa and the southwestern and southeastern United States. Until 1940, 90% of the peanuts grown in the US state of Georgia were Spanish types, but the trend since then has been larger-seeded, higher-yielding, more disease-resistant cultivars. Spanish peanuts have a higher oil content than other types of peanuts. In the US, the Spanish group is primarily grown in New Mexico, Oklahoma, and Texas.<sup>[26]</sup>

Cultivars of the Spanish group include 'Dixie Spanish', 'Improved Spanish 2B', 'GFA Spanish', 'Argentine', 'Spantex', 'Spanette', 'Shaffers Spanish', 'Natal Common (Spanish)', 'White Kernel Varieties', 'Starr', 'Comet', 'Florispan', 'Spanhoma', 'Spancross', 'OLin', 'Tamsan 90', 'AT 9899-14', 'Spanco', 'Wilco I', 'GG 2', 'GG 4', 'TMV 2', and 'Tamnut 06'.

### Runner group

Since 1940, the southeastern US region has seen a shift to producing Runner group peanuts. This shift is due to good flavor, better roasting characteristics, and higher yields than Spanish types, leading to food manufacturers' preference for the use in peanut butter and salted nuts. Georgia's production is now almost 100% Runner-type.<sup>[28]</sup>

Cultivars of Runners include 'Southeastern Runner 56-15', 'Dixie Runner', 'Early Runner', 'Virginia Bunch 67', 'Bradford Runner', 'Egyptian Giant' (also known as 'Virginia Bunch' and 'Giant'), 'Rhodesian Spanish Bunch' (Valencia and Virginia Bunch), 'North Carolina Runner 56-15', 'Florunner', 'Virugard', 'Georgia Green', 'Tamrun 96', 'Flavor Runner 458', 'Tamrun OLO1', 'Tamrun OLO2', 'AT-120', 'Andru-93', 'Southern Runner', 'AT1-1', 'Georgia Brown', 'GK-7', and 'AT-108'.

### Virginia group

The large-seeded Virginia group peanuts are grown in the US states of Virginia, North Carolina, Tennessee, Texas, New Mexico, Oklahoma, and parts of Georgia. They are increasing in popularity due to the demand for large peanuts for processing, particularly for salting, confections, and roasting in shells.

Virginia group peanuts are either bunch or running in growth habit. The bunch type is upright to spreading. It attains a height of 45 to 55 cm (18 to 22 in), and a spread of 70 to 80 cm (28 to 31 in), with 80 to 90 cm (31 to 35 in) rows that seldom cover the ground. The pods are borne within 5 to 10 cm (2 to 4 in) of the base of the plant.

Cultivars of Virginia-type peanuts include 'NC 7', 'NC 9', 'NC 10C', 'NC-V 11', 'VA 93B', 'NC 12C', 'VA-C 92R', 'Gregory', 'VA 98R', 'Perry', 'Wilson', 'Hull', 'AT VC-2' and 'Shulamit'.

### Valencia group

Valencia group peanuts are coarse and have heavy reddish stems and large foliage. In the United States, large-scale commercial production is mainly in the South Plains of West Texas and in eastern New Mexico near and south of Portales, but they are grown on a small scale elsewhere in the South as the best-flavored and preferred type for boiled peanuts. They are comparatively tall, reaching a height of 125 cm (49 in) and a spread of 75 cm (30 in). Peanut pods are borne on pegs arising from the main stem and the side branches. Most pods are clustered around the base of the plant, and only a few are found several inches away. Valencia types are three- to five-seeded and smooth, with no constriction of the shell between the seeds. Seeds are oval and tightly crowded into the pods. Typical seed weight is 0.4 to 0.5 g. This type is used heavily for selling roasted and salted in-shell peanuts and peanut butter. Varieties include 'Valencia A' and 'Valencia C'.



Valencia peanuts

### Tennessee Red and Tennessee White groups

These are alike except for the color of the seed. Sometimes known also as Texas Red or White, the plants are similar to Valencia types, except the stems are green to greenish brown, and the pods are rough, irregular, and have a smaller proportion of kernels.



## Cultivation



Peanut pegs growing into the soil. The tip of the peg, once buried, swells and develops into a peanut fruit.

seasons are sufficiently long.



Cultivation of peanut crop at the [Indian Directorate of Groundnut Research](#) ([Junagadh](#), [Gujarat](#), 2009)

Peanuts grow best in light, sandy loam soil with a pH of 5.9–7. Their capacity to fix nitrogen means that providing they nodulate properly, peanuts benefit little or not at all from nitrogen-containing fertilizer.<sup>[29]</sup> and they improve soil fertility. Therefore, they are valuable in crop rotations. Also, the yield of the peanut crop itself is increased in rotations through reduced diseases, pests, and weeds. For example, in [Texas](#), peanuts in a three-year rotation with corn yield 50% more than nonrotated peanuts.<sup>[29]</sup> Adequate levels of phosphorus, potassium, calcium, magnesium, and micronutrients are also necessary for good yields.<sup>[29]</sup> Peanuts need warm weather throughout the growing season to develop well. They can be grown with as little as 350 mm (14 in) of water,<sup>[30]</sup> but for best yields need at least 500 mm (20 in).<sup>[31]</sup> Depending on growing conditions and the cultivar of peanut, harvest is usually 90 to 130 days after planting for subspecies *A. h. fastigiata* types, and 120 to 150 days after planting for subspecies *A. h. hypogaea* types.<sup>[30][32][33]</sup> Subspecies *A. h. hypogaea* types yield more and are usually preferred where the growing

Peanut plants continue to produce flowers when pods are developing; therefore, some pods are immature even when they are ready for harvest. To maximize yield, the timing of harvest is important. If it is too early, too many pods will be unripe; if too late, the pods will snap off at the stalk and remain in the soil.<sup>[34]</sup> For harvesting, the entire plant, including most of the roots, is removed from the soil.<sup>[34]</sup> The pods are covered with a network of raised veins and are constricted between seeds.

The main yield-limiting factors in semi-arid regions are drought and high-temperature stress. The stages of reproductive development before flowering, at flowering, and at early pod development are particularly sensitive to these constraints. Apart from nitrogen, phosphorus and potassium, other nutrient deficiencies causing significant yield losses are calcium, iron and boron. Biotic stresses mainly include pests, diseases, and weeds. Among insects pests, pod borers, aphids, and mites are of importance. The most important diseases are leaf spots, rusts, and the toxin-producing fungus *Aspergillus*.<sup>[35]</sup>

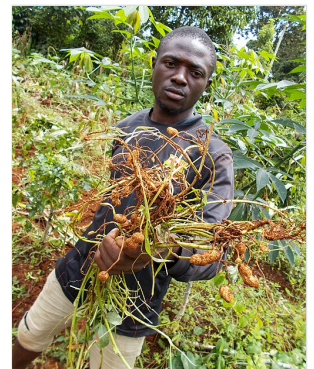
Harvesting occurs in two stages.<sup>[28]</sup> In mechanized systems, a machine is used to cut off the main root of the peanut plant by cutting through the soil just below the level of the peanut pods. The machine lifts the "bush" from the ground, shakes it, then inverts it, leaving the plant upside down to keep the peanuts out of the soil. This allows the peanuts to dry slowly to a little less than a third of their original moisture level over three to four days. Traditionally, peanuts were pulled and inverted by hand.

After the peanuts have dried sufficiently, they are threshed, removing the peanut pods from the rest of the bush.<sup>[34]</sup> Peanuts must be dried properly and stored in dry conditions. If they are too high in moisture, or if storage conditions are poor, they may become infected by the mold fungus *Aspergillus flavus*. Many strains of this fungus release toxic and highly carcinogenic substances called aflatoxins.

### Pests and diseases

If peanut plants are subjected to severe drought during pod formation, or if pods are not properly stored, they may become contaminated with the mold *Aspergillus flavus* which may produce carcinogenic substances called aflatoxins. Lower-quality peanuts, particularly where mold is evident, are more likely to be contaminated.<sup>[36]</sup> The USDA tests every truckload of raw peanuts for aflatoxin; any containing aflatoxin levels of more than 15 parts per billion are destroyed. The peanut industry has manufacturing steps to ensure all peanuts are inspected for aflatoxin.<sup>[37]</sup> Peanuts tested to have high aflatoxin are used to make peanut oil where the mold can be removed.<sup>[38]</sup>

The plant leaves can also be affected by a fungus, *Alternaria arachidis*.<sup>[39]</sup>



Harvest of peanuts ([Bandjoun](#), [Cameroon](#), 2016)

## Production

In 2023, world production of peanuts (reported as groundnuts excluding shelled) was 54 million tonnes, led by China with 36% of the total and India with 19% (table).

# Toxicity

## Allergies

Some people (1.4–2% in Europe and the United States<sup>[41]</sup>) report that they experience allergic reactions to peanut exposure; symptoms can be especially severe, ranging from watery eyes to anaphylactic shock, the latter of which is generally fatal if untreated. Eating a small amount of peanuts can cause a reaction. Because of their widespread use in prepared and packaged foods, avoiding peanuts can be difficult. Reading ingredients and warnings on product packaging is necessary to avoid this allergen. Foods processed in facilities that also handle peanuts on the same equipment as other foods are required to carry such warnings on their labels. Avoiding cross-contamination with peanuts and peanut products (along with other severe allergens like shellfish) is a promoted and common practice of which chefs and restaurants worldwide are becoming aware.

The hygiene hypothesis of allergy states that a lack of early childhood exposure to infectious agents like germs and parasites could be causing the increase in food allergies.<sup>[42]</sup>

Studies comparing age of peanut introduction in Great Britain with introduction in Israel showed that delaying exposure to peanuts in childhood can dramatically increase the risk of developing peanut allergies.<sup>[43][44]</sup>

Peanut allergy has been associated with the use of skin preparations containing peanut oil among children, but the evidence is not regarded as conclusive.<sup>[45]</sup> Peanut allergies have also been associated with family history and intake of soy products.<sup>[45]</sup>

Some school districts in the US and elsewhere have banned peanuts or products containing peanuts.<sup>[46][47][48]</sup> However, the efficacy of the bans in reducing allergic reactions is uncertain. A 2015 study in Canada found no difference in the percentage of accidental exposures occurring in schools prohibiting peanuts compared to schools allowing them.<sup>[49]</sup>

Refined peanut oil will not cause allergic reactions in most people with peanut allergies.<sup>[50]</sup> However, crude (unrefined) peanut oils have been shown to contain protein, which may cause allergic reactions.<sup>[51]</sup> In a randomized, double-blind crossover study, 60 people with proven peanut allergy were challenged with both crude peanut oil and refined peanut oil. The authors concluded, "Crude peanut oil caused allergic reactions in 10% of allergic subjects studied and should continue to be avoided." They also stated, "Refined peanut oil does not seem to pose a risk to most people with peanut allergy." However, they point out that refined peanut oil can still pose a risk to peanut-allergic individuals if the oil that has previously been used for cooking foods containing peanuts is reused.<sup>[52]</sup>

# Uses

## Nutrition

Raw Valencia peanuts are 4% water, 48% fat, 25% protein, and 21% carbohydrates (table).



In a reference amount of 100 grams (3.5 oz), peanuts provide 2,385 kilojoules (570 kilocalories) of food energy, supply 9 g (0.32 oz) of dietary fiber, and are a rich source (defined as more than 20% of the Daily Value, DV) of several B vitamins, vitamin E, and various dietary minerals, such as manganese, magnesium, and phosphorus. The fats are mainly polyunsaturated and monounsaturated (83% of total fats when combined; table source).

Some studies show that regular consumption of peanuts is associated with a lower specific risk of mortality from certain diseases.<sup>[55][13]</sup> However, the study designs do not allow cause and effect to be inferred. According to the US Food and Drug Administration, "Scientific evidence suggests but does not prove that eating 1.5 ounces per day of most nuts (such as peanuts) as part of a diet low in saturated fat and cholesterol may reduce the risk of heart disease."<sup>[56]</sup>

## Culinary

### Whole peanuts

Dry-roasting peanuts is a common form of preparation. Dry peanuts can be roasted in the shell or shelled in a home oven if spread out one layer deep in a pan and baked at a temperature of 177 °C (351 °F) for 15 to 20 min (shelled) and 20 to 25 min (in shell).

|   |             |
|---|-------------|
| Peanut production<br>2023, millions of tonnes   |             |
|  <a href="#">China</a>         | 19.2        |
|  <a href="#">India</a>         | 10.3        |
|  <a href="#">Nigeria</a>       | 4.3         |
|  <a href="#">United States</a> | 2.7         |
|  <a href="#">Sudan</a>         | 1.4         |
| <b>World</b>  | <b>54.3</b> |
| Source: FAOSTAT<br>of the <a href="#">United Nations</a> <sup>[40]</sup>  |             |

| Peanuts, valencia, raw   |                     |
|--|---------------------|
| Nutritional value per 100 g (3.5 oz)   |                     |
| <b>Energy</b>  | 2,385 kJ (570 kcal) |
| <b>Carbohydrates</b>   | 21 g                |
| Dietary fiber  | 9 g                 |
| <b>Fat</b>   | 48 g                |
| Saturated  | 7 g                 |
| Monounsaturated  | 24 g                |
| Polyunsaturated  | 16 g                |
| <b>Protein</b>   | 25 g                |
| <b>Amino acids</b>   |                     |
| <b>Vitamins and minerals</b>   |                     |
| <b>Other constituents</b>  | <b>Quantity</b>     |
| Water  | 4.26 g              |
| Link to full USDA Database entry ( <a href="https://fdc.nal.usda.gov/food-details/172432/nutrients">https://fdc.nal.usda.gov/food-details/172432/nutrients</a> )   |                     |
| †Percentages estimated using<br>US recommendations for adults, <sup>[53]</sup> except for<br>potassium, which is estimated based on expert<br>recommendation from the <a href="#">National Academies</a> , <sup>[54]</sup> |                     |



Roasted peanuts as snack food

Boiled peanuts are a popular snack in India, China, West Africa, and the southern United States. In the US South, boiled peanuts are often prepared in briny water and sold in streetside stands.

A distinction can be drawn between raw and green peanuts. A green peanut is a term to describe farm-fresh harvested peanuts that have not been dehydrated. They are available from grocery stores, food distributors, and farmers markets during the growing season. Raw peanuts are also uncooked but have been dried/dehydrated and must be rehydrated before boiling (usually in a bowl full of water overnight). Once rehydrated, the raw peanuts are ready to be boiled.<sup>[57]</sup>

### Peanut oil

Peanut oil is often used in cooking because it has a mild flavor and a relatively high smoke point. Due to its high monounsaturated content, it is considered more healthful than saturated oils and is resistant to rancidity. The several types of peanut oil include aromatic roasted peanut oil, refined peanut oil, extra virgin or cold-pressed peanut oil, and peanut extract. Refined peanut oil is exempt from allergen labeling laws in the US.<sup>[58]</sup>

A common cooking and salad oil, peanut oil is 46% monounsaturated fats (primarily oleic acid), 32% polyunsaturated fats (primarily linoleic acid), and 17% saturated fats (primarily palmitic acid) (source in nutrition table).<sup>[59]</sup> Extractable from whole peanuts using a simple water and centrifugation method, the oil is being considered by NASA's Advanced Life Support program for future long-duration human space missions.<sup>[60]</sup>



Peanut oil

### Peanut butter

Peanut butter is a food paste or spread made from ground dry roasted peanuts. It often contains additional ingredients that modify the taste or texture, such as salt, sweeteners, or emulsifiers. Many companies have added twists on traditionally plain peanut butter by adding various flavor varieties, such as chocolate, birthday cake, and cinnamon raisin.<sup>[61]</sup> Peanut butter is served as a spread on bread, toast or crackers, and used to make sandwiches (notably the peanut butter and jelly sandwich). It is also used in a number of confections, such as peanut-flavored granola bars or croissants and other pastries. The United States<sup>[62]</sup> is a leading exporter of peanut butter, and itself consumes \$800 million of peanut butter annually.<sup>[63]</sup>



Peanut butter

### Peanut flour

Peanut flour is used in gluten-free cooking.

### Peanut proteins

Peanut protein concentrates and isolates are commercially produced from defatted peanut flour using several methods. Peanut flour concentrates (about 70% protein) are produced from dehulled kernels by removing most of the oil and the water-soluble, non-protein components. Hydraulic pressing, screw pressing, solvent extraction, and pre-pressing followed by solvent extraction may be used for oil removal, after which protein isolation and purification are implemented.<sup>[64]</sup>

### Latin America

Peanuts are particularly common in Peruvian and Mexican cuisine, both of which marry indigenous and European ingredients. For instance, in Peru, a popular traditional dish is *picante de cuy*,<sup>[65]</sup> a roasted guinea pig served in a sauce of ground peanuts (ingredients native to South America) with roasted onions and garlic (ingredients from European cuisine). Also, in the Peruvian city of Arequipa, a dish called *ocopa* consists of a smooth sauce of roasted peanuts and hot peppers (both native to the region) with roasted onions, garlic, and oil, poured over meat or potatoes.<sup>[66]</sup> Another example is a fricassee combining a similar mixture with sautéed seafood or boiled and shredded chicken. These dishes are generally known as *ajíes*, meaning "hot peppers", such as *ají de pollo* and *ají de mariscos* (seafood *ajíes* may omit peanuts). In Mexico, it is also used to prepare different traditional dishes, such as chicken in peanut sauce (*encacahuatado*), and is used as the main ingredient for the preparation of other famous dishes such as red pipián, mole poblano and oaxacan mole negro.<sup>[67]</sup>



Japanese-style peanuts, invented in Mexico

Likewise, during colonial times in Peru, the Spanish used peanuts to replace nuts unavailable locally but used extensively in Spanish cuisine, such as almonds and pine nuts, typically ground or as a paste mixed with rice, meats, and vegetables for dishes like rice pilaf.



Throughout the region, many candies and snacks are made using peanuts. In Mexico, it is common to find them in different presentations as a snack or candy: salty, "Japanese" peanuts, praline, enchilados or in the form of a traditional sweet made with peanuts and honey called palanqueta, and even as peanut marzipan. There is a similar form of peanut candy in Brazil, called pé-de-moleque, made with peanuts and molasses, which resembles the Indian chikki in form.<sup>[68]</sup>

## West Asia

Crunchy coated peanuts, called kabukim in Hebrew, are a popular snack in Israel. Kabukim are commonly sold by weight at corner stores where fresh nuts and seeds are sold, though they are also available packaged. The coating typically consists of flour, salt, starch, lecithin, and sometimes sesame seeds. The origin of the name is obscure (it may be derived from kabuk, which means nutshell or husk in Turkish). An additional variety of crunchy coated peanuts popular in Israel is "American peanuts". The coating of this variety is thinner but harder to crack.

Bamba puffs are a popular snack in Israel. Their shape is similar to Cheez Doodles, but they are made of peanuts and corn.

## Southeast Asia

Peanuts are also widely used in Southeast Asian cuisine, such as in Malaysia, Vietnam, and Indonesia, where they are typically made into a spicy sauce. Peanuts came to Indonesia from the Philippines, where the legume was derived from Mexico during Spanish colonization. One Philippine dish using peanuts is kare-kare, a mixture of meat and peanut butter. Apart from being used in dishes, fried shelled peanuts are a common inexpensive snack in the Philippines. The peanuts are commonly served plain salted with garlic chips and variants, including adobo and chili flavors.

Common Indonesian peanut-based dishes include gado-gado, pecel, karedok, and ketoprak, vegetable salads mixed with peanut sauce, and the peanut-based sauce, satay.



Fried peanuts in the Philippines

## Indian subcontinent

In the Indian subcontinent, peanuts are a light snack, usually roasted and salted (sometimes with the addition of chilli powder), and often sold roasted in pods or boiled with salt. They are also made into dessert or sweet snack of peanut brittle by processing with refined sugar and jaggery. Indian cuisine uses roasted, crushed peanuts to give a crunchy body to salads; they are added whole (without pods) to leafy vegetable stews for the same reason. Another use is peanut oil for cooking. Most Indians use mustard, sunflower, and peanut oil for cooking. In South India, groundnut chutney is eaten with dosa and idli as breakfast. Peanuts are also used in sweets and savory items in South India and also as a flavor in tamarind rice. Kovilpatti is known for its sweet peanut chikki or peanut brittle, which is also used in savory and sweet mixtures, such as Bombay mix.



Boiled groundnuts (peanuts)

## West Africa

Peanuts grow well in southern Mali and adjacent regions of the Ivory Coast, Burkina Faso, Ghana, Nigeria, and Senegal; peanuts are similar in both agricultural and culinary qualities to the Bambara groundnut native to the region, and West Africans have adopted the crop as a staple. Peanut sauce, prepared with onions, garlic, peanut butter/paste, and vegetables such as carrots, cabbage, and cauliflower, can be vegetarian (the peanuts supplying ample protein) or prepared with meat, usually chicken.

Peanuts are used in the Malian meat stew maafe. In Ghana, peanut butter is used for peanut butter soup nkate nkwan.<sup>[69]</sup> Crushed peanuts may also be used for peanut candies nkate cake and kuli-kuli, as well as other local foods such as oto.<sup>[69]</sup> Peanut butter is an ingredient in Nigeria's "African salad". Peanut powder is an important ingredient in the spicy coating for kebabs (Suya) in Nigeria and Ghana.

## East Africa

Peanuts are a common ingredient of several types of relishes (dishes which accompany nshima) eaten in Malawi, and in the eastern part of Zambia, and these dishes are common throughout both countries. Thick peanut butter sauces are also made in Uganda to serve with rice and other starchy foods. Groundnut stew, called ebinyebwa in Luganda-speaking areas of Uganda, is made by boiling ground peanut flour with other ingredients, such as cabbage, mushrooms, dried fish, meat or other vegetables.<sup>[70]</sup> Across East Africa, roasted peanuts, often in cones of newspaper, are obtained from street vendors.



Peanut plant

## North America

The state of Georgia leads the US in peanut production, with 49 percent of the nation's peanut acreage and output. In 2014, farmers cultivated 591,000 acres of peanuts, yielding of 2.4 billion pounds. The most famous peanut farmer was Jimmy Carter of Sumter County, Georgia, who became US president in 1976.<sup>[71]</sup>



Fried curry peanuts

In the US and Canada, peanuts are used in candies, cakes, cookies, and other sweets. Individually, they are eaten dry-roasted with or without salt. Ninety-five percent of Canadians eat peanuts or peanut butter, with the average consumption of 3 kilograms (6½ lb) of peanuts per person annually, and 79% of Canadians consume peanut butter weekly.<sup>[72]</sup> In the United States, peanuts and peanut butter are central to American dietary practices, and are typically considered as comfort foods.<sup>[73]</sup> Peanuts were sold at fairs or by pushcart operators through the 19th century.<sup>[74]</sup> Peanut butter is a common peanut-based food, representing half of the American total peanut consumption and \$850 million in annual retail sales.<sup>[75]</sup> Peanut soup is found on restaurant menus in the southeastern states.<sup>[76]</sup> In some southern portions of the US, peanuts are boiled for several hours until soft and moist.<sup>[77]</sup> Peanuts are also deep-fried, sometimes within the shell. Per person, Americans eat 2.7 kg (6 lb) of peanut products annually, spending a total of \$2 billion in peanut retail purchases.<sup>[75]</sup>

## Manufacturing

### Industrial

Peanuts have a variety of industrial end uses. Paint, varnish, lubricating oil, leather dressings, furniture polish, insecticides, and nitroglycerin are made from peanut oil. Soap is made from saponified oil, and many cosmetics contain peanut oil and its derivatives. The protein portion is used in the manufacture of some textile fibers. Peanut shells are used in the manufacture of plastic, wallboard, abrasives, fuel, cellulose (used in rayon and paper), and mucilage (glue).

### Malnutrition

With their high protein concentration, peanuts are used to help reduce or prevent malnutrition. Plumpy Nut, MANA Nutrition,<sup>[78][79]</sup> and Medika Mamba<sup>[80]</sup> are high-protein, high-energy, and high-nutrient peanut-based pastes developed to be used as a therapeutic food to aid in famine relief. The World Health Organization, UNICEF, Project Peanut Butter, and Doctors Without Borders have used these products to help save malnourished children in developing countries.

Peanuts can be used like other legumes and grains to make a lactose-free, milk-like beverage, peanut milk, which is promoted in Africa as a way to reduce malnutrition among children.

### Animal feed

Peanut plant tops and crop residues can be used for silage.<sup>[81]</sup>

The protein cake (oilcake meal) residue from oil processing is used as animal feed and soil fertilizer. **Groundnut cake** is a livestock feed, mostly used by cattle as protein supplements.<sup>[82]</sup> It is one of the most important and valuable feeds for all types of livestock and one of the most active ingredients for poultry rations.<sup>[83]</sup> Poor storage of the cake may sometimes result in its contamination by aflatoxin, a naturally occurring mycotoxin that is produced by Aspergillus flavus and Aspergillus parasiticus.<sup>[84]</sup> The major constituents of the cake are essential amino acids such as lysine and glutamine. Other components are crude fiber, crude protein, and fat.

Some peanuts can also be fed whole to livestock, for example, those over the peanut quota in the US or those with a higher aflatoxin content than that permitted by the food regulations.<sup>[85]</sup>

Peanut processing often requires dehulling: the hulls generated in large amounts by the peanut industries can feed livestock, particularly ruminants.<sup>[86]</sup>



## Gallery



Roasted Peanuts with shell



A warning sign for the presence of peanuts and peanut dust



*Arachis hypogaea* flower



Peanut pegs penetrating the ground



Textural detail



Developing pods of peanut



Track-type peanut harvester



Harvesting peanuts by hand (Haiti, 2012)



A bowl of sev mamra, consisting of puffed rice, peanuts and fried seasoned noodles



Peanut sweet known as chikki made from peanuts and jaggery

## See also

- Aflatoxin
- African Groundnut Council
- BBCH-scale (peanut)
- Beer Nuts
- Columbian exchange
- Cracker nuts
- Ground nut soup
- List of peanut dishes
- List of edible seeds
- Peanut pie
- Power snack
- Tanganyika groundnut scheme, a failure started in 1951
- Universal Nut Sheller



## Notes

a. One of the original names, along with **ground pea**.

## References

1. "*Arachis hypogaea* (L.)" (<https://www.worldfloraonline.org/taxon/wfo-0000174378>). *The World Flora Online*. World Flora Consortium. 2024. Retrieved May 31, 2024.
2. *USDA GRIN Taxonomy* (<https://npgsweb.ars-grin.gov/gringlobal/taxonomydetail.aspx?id=3785>), retrieved June 29, 2016.
3. Domonoske, Camila (April 20, 2014). "A Legume With Many Names: The Story Of 'Goober' " (<https://www.npr.org/sections/codeswitch/2014/04/20/304585019/a-legume-with-many-names-the-story-of-goober>). *National Public Radio*. Archived (<https://web.archive.org/web/20200606234944/https://www.npr.org/sections/codeswitch/2014/04/20/304585019/a-legume-with-many-names-the-story-of-goober>) from the original on June 6, 2020.

4. Beattie, H. R. (1911). "Farmer's Bulletin No. 431" (<https://www.nal.usda.gov/exhibits/ipd/carver/items/show/77>). *USDA National Agricultural Library*. "The peanut is known under the local names of 'goober', 'goober pea', 'pindar', 'ground pea', and 'groundnut'. The names 'goober' and 'goober pea' are more properly applied to an allied species having no true stem and only one pea in each pod which has been introduced and is frequently found growing wild in the Gulf Coast States."
5. Hymowitz, Theodore (1990). "Grain Legumes" (<https://www.hort.purdue.edu/newcrop/proceedings1990/V1-154.html>). In Janick, J.; Simon, J. E. (eds.). *Advances in new crops*. Portland, OR: Timber Press. pp. 54–57.
6. "Oil crops for the production of advanced biofuels" ([https://web.archive.org/web/20150909130233/http://www.biofuelstp.eu/oil\\_crops.html](https://web.archive.org/web/20150909130233/http://www.biofuelstp.eu/oil_crops.html)). *European Biofuels Technology Platform*. Archived from the original ([http://www.biofuelstp.eu/oil\\_crops.html](http://www.biofuelstp.eu/oil_crops.html)) on September 9, 2015. Retrieved September 28, 2015.
7. "Legumes Of The World" (<http://www.kew.org/science-conservation/research-data/resources/legumes-of-the-world>). *Royal Botanic Gardens, Kew*. Retrieved September 29, 2015.
8. "The Peanut Institute – Peanut Facts" (<https://web.archive.org/web/20190408185751/http://www.peanut-institute.org/peanut-facts/>). *peanut-institute.org*. Archived from the original (<http://www.peanut-institute.org/peanut-facts/>) on April 8, 2019.
9. Putnam, D.H., et al. (1991) Peanut (<http://www.hort.purdue.edu/newcrop/afcm/peanut.html>) Archived (<https://web.archive.org/web/20060810173649/http://www.hort.purdue.edu/newcrop/afcm/peanut.html>) August 10, 2006, at the Wayback Machine. University of Wisconsin-Extension Cooperative Extension: Alternative Field Crops Manual.
10. Meng, Zhao (June 27, 2024). "The Anatomical Basis and Molecular Mechanism of *Arachis hypogaea* Nyctinastic Movement" ([https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=4873031](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4873031)). *SSRN*. SSRN 4873031 ([https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=4873031](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4873031)). Retrieved August 11, 2025.
11. Krapovickas, Antonio; Gregory, Walton C. (2007). "Taxonomy of the genus *Arachis* (Leguminosae)" ([https://web.archive.org/web/20160304060107/http://ibone.unne.edu.ar/objetos/uploads/documentos/bonplandia/public/16\\_0/1\\_205.pdf](https://web.archive.org/web/20160304060107/http://ibone.unne.edu.ar/objetos/uploads/documentos/bonplandia/public/16_0/1_205.pdf)) (PDF). *IBONE*. 16 (Supl.). Translated by David E. Williams and Charles E. Simpson: 1–205. Archived from the original ([http://ibone.unne.edu.ar/objetos/uploads/documentos/bonplandia/public/16\\_0/1\\_205.pdf](http://ibone.unne.edu.ar/objetos/uploads/documentos/bonplandia/public/16_0/1_205.pdf)) (PDF) on March 4, 2016. Retrieved September 13, 2016.
12. Smith, Ben W. (January 1, 1950). "Arachis hypogaea. Aerial Flower and Subterranean Fruit". *American Journal of Botany*. **37** (10): 802–815. doi:10.2307/2437758 (<https://doi.org/10.2307/2437758>). JSTOR 2437758 (<https://www.jstor.org/stable/2437758>).
13. "Nuts (including peanuts)" (<https://lpi.oregonstate.edu/mic/food-beverages/nuts>). Micronutrient Information Center. Linus Pauling Institute, Oregon State University. September 2018. Retrieved July 2, 2025.
14. "Resveratrol" (<https://lpi.oregonstate.edu/mic/dietary-factors/phytochemicals/resveratrol>). Micronutrient Information Center. Linus Pauling Institute, Oregon State University. May 2015. Retrieved July 2, 2025.
15. Seijo, Guillermo; Lavia, Graciela I.; Fernandez, Aveliano; et al. (December 1, 2007). "Genomic relationships between the cultivated peanut (*Arachis hypogaea*, Leguminosae) and its close relatives revealed by double GISH" (<https://doi.org/10.3732/ajb.94.12.1963>). *American Journal of Botany*. **94** (12): 1963–1971. Bibcode:2007AmJB...94.1963S (<https://ui.adsabs.harvard.edu/abs/2007AmJB...94.1963S>). doi:10.3732/ajb.94.12.1963 (<https://doi.org/10.3732/ajb.94.12.1963>). hdl:11336/36879 (<https://hdl.handle.net/11336/36879>). ISSN 0002-9122 (<https://search.worldcat.org/issn/0002-9122>). PMID 21636391 (<https://pubmed.ncbi.nlm.nih.gov/21636391/>).
16. Kochert, Gary; Stalker, H. Thomas; Gimenes, Marcos; et al. (October 1, 1996). "RFLP and Cytogenetic Evidence on the Origin and Evolution of Allotetraploid Domesticated Peanut, *Arachis hypogaea* (Leguminosae)". *American Journal of Botany*. **83** (10): 1282–1291. doi:10.2307/2446112 (<https://doi.org/10.2307/2446112>). JSTOR 2446112 (<https://www.jstor.org/stable/2446112>).
17. Moretzsohn, Márcio C.; Gouvea, Ediene G.; Inglis, Peter W.; et al. (January 1, 2013). "A study of the relationships of cultivated peanut (*Arachis hypogaea*) and its most closely related wild species using intron sequences and microsatellite markers" (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3523650>). *Annals of Botany*. **111** (1): 113–126. doi:10.1093/aob/mcs237 (<https://doi.org/10.1093/aob/mcs237>). ISSN 0305-7364 (<https://search.worldcat.org/issn/0305-7364>). PMC 3523650 (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3523650>). PMID 23131301 (<https://pubmed.ncbi.nlm.nih.gov/23131301/>).
18. Dillehay, Tom D. "Earliest-known evidence of peanut, cotton and squash farming found" ([https://web.archive.org/web/20070911192923/http://www.eurekalert.org/pub\\_releases/2007-06/vu-eeo062507.php](https://web.archive.org/web/20070911192923/http://www.eurekalert.org/pub_releases/2007-06/vu-eeo062507.php)). *eurekalert.org*. Archived from the original ([http://www.eurekalert.org/pub\\_releases/2007-06/vu-eeo062507.php](http://www.eurekalert.org/pub_releases/2007-06/vu-eeo062507.php)) on September 11, 2007. Retrieved June 29, 2007.
19. Berrin, Katherine & Larco Museum. *The Spirit of Ancient Peru: Treasures from the Museo Arqueológico Rafael Larco Herrera*. New York: Thames & Hudson, 1997.
20. Polo, Claudia (November 21, 2023). "El 'cacau del collar' el cacahuete valenciano al borde de la extinción" (<https://elpais.com/gastronomia/2023-11-21/el-cacau-del-collaret-el-cacahuete-valenciano-al-borde-de-la-extincion.html>). *El País* (in Spanish). Retrieved February 1, 2024.
21. Carney, Judith (2011). *In the Shadow of Slavery Africa's Botanical Legacy in the Atlantic World* (<https://books.google.com/books?id=N-eS3OUQsekC&q=peanut>). University of California Press. p. 141. ISBN 9780520949539.
22. Romans, B. (1775). *A Concise Natural History of East and West Florida*. New York: Printed for the author. p. 131 (<http://archive.org/details/concisenaturalhi00roma/page/130/mode/2up>). OCLC 745317190 (<https://search.worldcat.org/oclc/745317190>).
23. McMurtry, Linda O. (1982). *George Washington Carver: scientist and symbol*. Galaxy books (1. issued as an Oxford Univ. Pr. paperback ed.). New York: Oxford University Press. ISBN 978-0-19-503205-5.

24. "Manufacture of peanut candy, US Patent #306727" (<http://pdfpiw.uspto.gov/piw?Docid=00306727&homeurl=http%3A%2F%2Fpatft.uspto.gov%2Fnetacgi%2Fnph-Parser%3FSection%3DPTO2%2526Section%3DHITOFF%2526p%3D1%2526u%3D%25252Fnethtml%25252FPTO%25252Fsearch-bool.html%2526r%3D1%2526f%3DG%2526l%3D50%2526co1%3DAND%2526d%3DPALL%2526s1%3D0306727.PN.%2526OS%3DPN%2F0306727%2526RS%3DPN%2F0306727&PageNum=&Rtype=&SectionNum=&idkey=NONE&Input=View+first+page>). US Patent Office. October 21, 1884. Archived (<https://web.archive.org/web/20170405145402/http://pdfpiw.uspto.gov/piw?Docid=00306727&homeurl=http%3A%2F%2Fpatft.uspto.gov%2Fnetacgi%2Fnph-Parser%3FSection%3DPTO2%2526Section%3DHITOFF%2526p%3D1%2526u%3D%25252Fnethtml%25252FPTO%25252Fsearch-bool.html%2526r%3D1%2526f%3DG%2526l%3D50%2526co1%3DAND%2526d%3DPALL%2526s1%3D0306727.PN.%2526OS%3DPN%2F0306727%2526RS%3DPN%2F0306727&PageNum=&Rtype=&SectionNum=&idkey=NONE&Input=View+first+page>) from the original on April 5, 2017. Retrieved May 8, 2017.
25. Michaud, Jon (November 28, 2012). "A chunky history of peanut butter" (<https://www.newyorker.com/books/page-turner/a-chunky-history-of-peanut-butter>). *newyorker.com*. New Yorker. Archived (<https://web.archive.org/web/20170331194928/http://www.newyorker.com/books/page-turner/a-chunky-history-of-peanut-butter>) from the original on March 31, 2017. Retrieved May 9, 2017.
26. Ruark, Elinor. "Peanut Cultivars and Descriptions" (<https://web.archive.org/web/20161122224427/http://caes2.caes.uga.edu/commodities/fieldcrops/peanuts/production/cultivardescription.html>). *caes2.caes.uga.edu*. Archived from the original (<http://caes2.caes.uga.edu/commodities/fieldcrops/peanuts/production/cultivardescription.html>) on November 22, 2016. Retrieved November 22, 2016.
27. "naomi chapman woodroof; Programs & People Summer 2000" ([https://www.cals.uidaho.edu/edcomm/magazine/summer\\_2000/naomi.html](https://www.cals.uidaho.edu/edcomm/magazine/summer_2000/naomi.html)). *www.cals.uidaho.edu*. Retrieved April 9, 2021.
28. Bilello, Stanley (October 10, 2016). *21st Century Homestead: Nitrogen-Fixing Crops* ([https://books.google.com/books?id=yZc\\_DQAAQBAJ&q=flavor,+oil+content,+size,+shape,+and+disease+resistance+peanuts&pg=PA93](https://books.google.com/books?id=yZc_DQAAQBAJ&q=flavor,+oil+content,+size,+shape,+and+disease+resistance+peanuts&pg=PA93)). Lulu.com. pp. 93–94. ISBN 9781365452901.
29. Baughman, Todd; Grichar, James; Black, Mark; Woodward, Jason; Porter, Pat; New, Leon; Baumann, Paul; McFarland, Mark "Texas Peanut Production Guide ([http://peanut.tamu.edu/files/2012/04/D\\_peanut\\_pdfs\\_productionguide07\\_3\\_11.pdf](http://peanut.tamu.edu/files/2012/04/D_peanut_pdfs_productionguide07_3_11.pdf)) Archived ([https://web.archive.org/web/20160304205427/http://peanut.tamu.edu/files/2012/04/D\\_peanut\\_pdfs\\_productionguide07\\_3\\_11.pdf](https://web.archive.org/web/20160304205427/http://peanut.tamu.edu/files/2012/04/D_peanut_pdfs_productionguide07_3_11.pdf)) March 4, 2016, at the Wayback Machine" (PDF). Texas A&M University. Retrieved October 16, 2015.
30. Schilling, Robert (February 5, 2003). "L'arachide histoire et perspectives" (<https://web.archive.org/web/20150504233111/http://www.museum.agropolis.fr/pages/savoirs/arachide/arachide.htm>). *L'arachide histoire et perspectives*. Agropolis Museum. Archived from the original (<http://museum.agropolis.fr/pages/savoirs/arachide/arachide.htm>) on May 4, 2015. Retrieved October 16, 2015.
31. Jauron, Richard (February 5, 1997). "Growing Peanuts in the Home Garden | Horticulture and Home Pest News" (<http://www.ipm.iastate.edu/ipm/hortnews/1997/5-2-1997/peanuts.html>). *ipm.iastate.edu*. Retrieved May 30, 2011.
32. Marsalis, Mark; Puppala, Naveen; Goldberg, Natalie; Ashigh, Jamshid; Sanogo, Soumaila; Trostle, Calvin (July 2009). "New Mexico Peanut Production" ([http://aces.nmsu.edu/pubs/\\_circulars/CR-645.pdf](http://aces.nmsu.edu/pubs/_circulars/CR-645.pdf)) (PDF). *Circular-645*. New Mexico State University. Retrieved October 16, 2015.
33. "Peanut" (<https://www.hort.purdue.edu/newcrop/afcm/peanut.html>). *www.hort.purdue.edu*. Retrieved October 16, 2015.
34. "How peanuts are Grown – Harvesting – PCA" ([https://web.archive.org/web/20080719165546/http://www.pca.com.au/howgrown.php?subaction=showfull&id=1207540158&archive=&start\\_from=&ucat=25&](https://web.archive.org/web/20080719165546/http://www.pca.com.au/howgrown.php?subaction=showfull&id=1207540158&archive=&start_from=&ucat=25&)). Peanut Company of Australia. Archived from the original ([http://www.pca.com.au/howgrown.php?subaction=showfull&id=1207540158&archive=&start\\_from=&ucat=25&](http://www.pca.com.au/howgrown.php?subaction=showfull&id=1207540158&archive=&start_from=&ucat=25&)) on July 19, 2008. Retrieved May 30, 2011.
35. Willy H. Verheye, ed. (2010). "Growth and Production of Groundnuts". *Soils, Plant Growth and Crop Production Volume II* (<https://www.eolss.net/ebooklib/bookinfo/soils-plan-t-growth-crop-production.aspx>). EOLSS Publishers. p. 153. ISBN 978-1-84826-368-0.
36. Hirano, S; Shima, T; Shimada, T (August 2001). "[Proportion of aflatoxin B1 contaminated kernels and its concentration in imported peanut samples]" (<https://doi.org/10.3358/2Fshokueishi.42.237>). *Shokuhin Eiseigaku Zasshi*. **42** (4): 237–42. doi:10.3358/shokueishi.42.237 (<https://doi.org/10.3358/2Fshokueishi.42.237>). PMID 11817138 (<https://pubmed.ncbi.nlm.nih.gov/11817138/>).
37. 7 CFR 2011 – Part 996a
38. "Why Georgia farmers decided to shell their own peanuts" (<https://web.archive.org/web/20190704053851/https://newfoodeconomy.org/georgia-peanut-farmers-face-an-unlikely-challenge-shelling/>). *New Food Economy*. April 26, 2017. Archived from the original (<https://newfoodeconomy.org/georgia-peanut-farmers-face-an-unlikely-challenge-shelling/>) on July 4, 2019. Retrieved July 4, 2019.
39. "Species Fungorum - Names Record" (<https://www.speciesfungorum.org/Names/NamesRecord.asp?RecordID=308498>). *www.speciesfungorum.org*. Retrieved August 7, 2023.
40. "Peanut production (as groundnuts excluding shelled) in 2023, Crops/Regions/World list/Production Quantity/Year (pick lists)" (<https://www.fao.org/faostat/en/#data/QCL>). UN Food and Agriculture Organization, Corporate Statistical Database (FAOSTAT). 2025. Retrieved July 2, 2025.
41. Lange L, et al. (September 28, 2021). "White paper on peanut allergy – part 1: Epidemiology, burden of disease, health economic aspects" (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8477625>). *Allergo J Int*. **30** (8): 261–269. doi:10.1007/s40629-021-00189-z (<https://doi.org/10.1007/s40629-021-00189-z>). PMC 8477625 (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8477625>). PMID 34603938 (<https://pubmed.ncbi.nlm.nih.gov/34603938/>).
42. "Peanut Allergy on the Rise: Why?" (<http://www.webmd.com/allergies/news/20100514/peanut-allergies-in-kids-on-the-rise>). *WebMD*. May 14, 2010. Retrieved May 18, 2010.
43. Food allergy advice may be peanuts ([http://www.sciencenews.org/view/generic/id/38370/title/Food\\_allergy\\_advice\\_may\\_be\\_peanuts](http://www.sciencenews.org/view/generic/id/38370/title/Food_allergy_advice_may_be_peanuts)) Archived ([https://web.archive.org/web/20081109032845/http://www.sciencenews.org/view/generic/id/38370/title/Food\\_allergy\\_advice\\_may\\_be\\_peanuts](https://web.archive.org/web/20081109032845/http://www.sciencenews.org/view/generic/id/38370/title/Food_allergy_advice_may_be_peanuts)) November 9, 2008, at the Wayback Machine, *Science News*, December 6, 2008
44. Høst, A; Halken, S; Muraro, A; Dreborg, S; Niggemann, B; Aalberse, R; Arshad, SH; Von Berg, A; et al. (2008). "Dietary prevention of allergic diseases in infants and small children". *Pediatric Allergy and Immunology*. **19** (1): 1–4. doi:10.1111/j.1399-3038.2007.00680.x (<https://doi.org/10.1111/j.1399-3038.2007.00680.x>). PMID 18199086 (<https://pubmed.ncbi.nlm.nih.gov/18199086/>). S2CID 8831420 (<https://api.semanticscholar.org/CorpusID:8831420>).
45. Lack G, Fox D, Northstone K, Golding J (2003). "Factors Associated with the Development of Peanut Allergy in Childhood" (<https://doi.org/10.1056/2FNEJMoa013536>). *New England Journal of Medicine*. **348** (11): 977–85. doi:10.1056/NEJMoa013536 (<https://doi.org/10.1056/2FNEJMoa013536>). PMID 12637607 (<https://pubmed.ncbi.nlm.nih.gov/12637607/>). S2CID 13280248 (<https://api.semanticscholar.org/CorpusID:13280248>).



46. Hartocollis, Anemona (September 23, 1998). "Nothing's Safe: Some Schools Ban Peanut Butter as Allergy Threat" (<https://query.nytimes.com/gst/fullpage.html?sec=health&res=9907E3D81E30F930A1575AC0A96E958260>). *The New York Times*. Retrieved August 18, 2009.
47. Nevius, C.W. (September 9, 2003). "One 5-year-old's allergy leads to class peanut ban" (<http://www.sfgate.com/cgi-bin/article.cgi?file=/chronicle/archive/2003/09/09/MN79933.DTL%0D>). *San Francisco Chronicle*. Retrieved August 18, 2009.
48. "School peanut ban in need of review" (<https://web.archive.org/web/20081005120233/http://www.nashuatelegraph.com/apps/pbcs.dll/article?AID=/20080914/OPINION01/309149938>). *Nashua Telegraph*. September 14, 2008. Archived from the original (<http://www.nashuatelegraph.com/apps/pbcs.dll/article?AID=/20080914/OPINION01/309149938>) on October 5, 2008. Retrieved August 18, 2009.
49. Cherkaoui, Sabine; Ben-Shoshan, Moshe; Alizadehfar, Reza; Asai, Yuka; Chan, Edmond; Cheuk, Stephen; Shand, Greg; St-Pierre, Yvan; Harada, Laurie (January 1, 2015). "Accidental exposures to peanut in a large cohort of Canadian children with peanut allergy" (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4389801>). *Clinical and Translational Allergy*. **5** 16. doi:10.1186/s13601-015-0055-x (<https://doi.org/10.1186/s13601-015-0055-x>). ISSN 2045-7022 (<https://search.worldcat.org/issn/2045-7022>). PMC 4389801 (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4389801>). PMID 25861446 (<https://pubmed.ncbi.nlm.nih.gov/25861446>).
50. "The anaphylaxis campaign: peanut oil" ([https://web.archive.org/web/20080418090105/http://www.anaphylaxis.org.uk/information/peanut\\_oil.html](https://web.archive.org/web/20080418090105/http://www.anaphylaxis.org.uk/information/peanut_oil.html)). Anaphylaxis.org.uk. Archived from the original ([http://www.anaphylaxis.org.uk/information/peanut\\_oil.html](http://www.anaphylaxis.org.uk/information/peanut_oil.html)) on April 18, 2008. Retrieved August 18, 2009.
51. Hoffman DR, Collins-Williams C (1994). "Cold-pressed peanut oils may contain peanut allergen" (<https://doi.org/10.1016%2F0091-6749%2894%2990262-3>). *The Journal of Allergy and Clinical Immunology*. **93** (4): 801–2. doi:10.1016/0091-6749(94)90262-3 (<https://doi.org/10.1016%2F0091-6749%2894%2990262-3>). PMID 8163791 (<https://pubmed.ncbi.nlm.nih.gov/8163791>).
52. Hourihane JO, Bedwani SJ, Dean TP, Warner JO (1997). "Randomised, double blind, crossover challenge study of allergenicity of peanut oils in subjects allergic to peanuts" (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2126478>). *BMJ*. **314** (7087): 1084–8. doi:10.1136/bmj.314.7087.1084 (<https://doi.org/10.1136%2Fbmj.314.7087.1084>). PMC 2126478 (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2126478>). PMID 9133891 (<https://pubmed.ncbi.nlm.nih.gov/9133891>).
53. United States Food and Drug Administration (2024). "Daily Value on the Nutrition and Supplement Facts Labels" (<https://www.fda.gov/food/nutrition-facts-label/daily-value-nutrition-and-supplement-facts-labels>). FDA. Archived (<https://web.archive.org/web/20240327175201/https://www.fda.gov/food/nutrition-facts-label/daily-value-nutrition-and-supplement-facts-labels>) from the original on March 27, 2024. Retrieved March 28, 2024.
54. "TABLE 4-7 Comparison of Potassium Adequate Intakes Established in This Report to Potassium Adequate Intakes Established in the 2005 DRI Report" ([https://www.ncbi.nlm.nih.gov/books/NBK545428/table/tab\\_4\\_7/](https://www.ncbi.nlm.nih.gov/books/NBK545428/table/tab_4_7/)). p. 120. In: Stallings, Virginia A.; Harrison, Meghan; Oria, Maria, eds. (2019). "Potassium: Dietary Reference Intakes for Adequacy". *Dietary Reference Intakes for Sodium and Potassium*. pp. 101–124. doi:10.17226/25353 (<https://doi.org/10.17226%2F25353>). ISBN 978-0-309-48834-1. PMID 30844154 (<https://pubmed.ncbi.nlm.nih.gov/30844154>). NCBI NBK545428 (<https://www.ncbi.nlm.nih.gov/books/NBK545428>).
55. Bao, Ying; Han, Jiali; Hu, Frank B.; Giovannucci, Edward L.; Stampfer, Meir J.; Willett, Walter C.; Fuchs, Charles S. (November 21, 2013). "Association of Nut Consumption with Total and Cause-Specific Mortality" (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3931001>). *New England Journal of Medicine*. **369** (21): 2001–2011. doi:10.1056/NEJMoa1307352 (<https://doi.org/10.1056%2FNEJMoa1307352>). ISSN 0028-4793 (<https://search.worldcat.org/issn/0028-4793>). PMC 3931001 (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3931001>). PMID 24256379 (<https://pubmed.ncbi.nlm.nih.gov/24256379>).
56. Taylor CL (July 14, 2003). "Qualified Health Claims: Letter of Enforcement Discretion – Nuts and Coronary Heart Disease (Docket No 02P-0505)" (<https://web.archive.org/web/20131002013831/http://www.fda.gov/Food/IngredientsPackagingLabeling/LabelingNutrition/ucm072926.htm>). Center for Food Safety and Applied Nutrition, FDA. Archived from the original (<https://www.fda.gov/Food/IngredientsPackagingLabeling/LabelingNutrition/ucm072926.htm>) on October 2, 2013. Retrieved October 14, 2015.
57. "FAQ" (<https://web.archive.org/web/20111113031350/http://www.boiledpeanuts.com/faq.html>). *BoiledPeanuts.com*. The Lee Bros. Archived from the original (<http://www.boiledpeanuts.com/faq.html>) on November 13, 2011. Retrieved October 30, 2011.
58. "Food Allergen Labeling and Consumer Protection Act of 2004 (Public Law 108-282, Title II)" (<https://web.archive.org/web/20090606082335/http://www.fda.gov/Food/LabelingNutrition/FoodAllergensLabeling/GuidanceComplianceRegulatoryInformation/ucm106187.htm>). FDA.gov. US Food & Drug Administration. Archived from the original (<https://www.fda.gov/Food/LabelingNutrition/FoodAllergensLabeling/GuidanceComplianceRegulatoryInformation/ucm106187.htm>) on June 6, 2009. Retrieved May 30, 2011.
59. Ozcan MM (2010). "Some nutritional characteristics of kernel and oil of peanut (*Arachis hypogaea* L.)" ([https://www.jstage.jst.go.jp/article/jos/59/1/59\\_1\\_1/pdf](https://www.jstage.jst.go.jp/article/jos/59/1/59_1_1/pdf)). *J Oleo Sci*. **59** (1): 1–5. doi:10.5650/jos.59.1 (<https://doi.org/10.5650%2Fjos.59.1>). PMID 20032593 (<https://pubmed.ncbi.nlm.nih.gov/20032593>).
60. Shi L, Lu JY, Jones G, Loretan PA, Hill WA (1998). "Characteristics and composition of peanut oil prepared by an aqueous extraction method". *Life Support Biosph Sci*. **5** (2): 225–9. PMID 11541680 (<https://pubmed.ncbi.nlm.nih.gov/11541680>).
61. Boyd, Kristine (November 6, 2017). "Crazy Peanut Butter Flavors You Need to Try Now! | Parenting" (<https://www.tlc.com/parenting/crazy-peanut-butter-flavors-you-need-to-try-now->). *TLC.com*. Retrieved August 6, 2022.
62. Press Release Number: CB23-SFS.152 (October 22, 2023). "U.S. Exports of (NAICS 311911) Roasted Nuts & Peanut Butter With All Countries" (<https://www.census.gov/newsroom/stories/nut-day.html>). *census.gov*. National Nut Day. Archived (<https://web.archive.org/web/20250821084742/https://www.census.gov/newsroom/stories/nut-day.html>) from the original on August 21, 2025. Retrieved August 21, 2025.
63. Chakravorty, Rup. "Breeding a better peanut butter" (<https://web.archive.org/web/20151110080259/https://www.agronomy.org/science-news/breeding-better-peanut-butter>). *agronomy.org*. American Society of Agronomy. Archived from the original (<https://www.agronomy.org/science-news/breeding-better-peanut-butter>) on November 10, 2015. Retrieved October 15, 2015.
64. Wang, Qiang (2016). *Peanuts: processing technology and product development*. London: Academic Press, Elsevier. doi:10.1016/C2015-0-02292-4 (<https://doi.org/10.1016%2FC2015-0-02292-4>). ISBN 978-0-12-809595-9. OCLC 951217525 (<https://search.worldcat.org/oclc/951217525>).
65. "Gastronomía de Huánuco - Platos típicos - Pachamanca Picante de cuy" (<http://www.huanuco.com/departamento/cultura/gastronomia/>). *huanuco.com*. Retrieved October 26, 2015.

66. "Menú, recetas, cocina, nutrición" (<https://web.archive.org/web/20151117021747/http://menuperu.elcomercio.pe/recetas/ocopa-1197>). *menuperu.elcomercio.pe*. Archived from the original (<http://menuperu.elcomercio.pe/recetas/ocopa-1197>) on November 17, 2015. Retrieved October 26, 2015.
67. "Demystifying mole, Mexico's national dish" (<https://www.mexconnect.com/articles/2122-demystifying-mole-mexico-s-national-dish/>). *MexConnect*. June 18, 2020. Retrieved January 2, 2025.
68. "Brazilian sweets and desserts you must taste" (<https://riodejaneirobycariocas.com/7-brazilian-sweets-and-desserts-you-must-taste-in-rio-de-janeiro/>). *riodejaneirobycariocas.com*. December 20, 2019. Retrieved April 8, 2023.
69. Ghanaian cuisine
70. "Ebinyebwa; a tale of the Ugandan groundnut stew" (<http://www.monitor.co.ug/SpecialReports/ugandaat50/-/1370466/1381822/-/uj1i9az/-/index.html>). *monitor.co.ug*. Kampala, Uganda: Daily Monitor/Monitor Publications Ltd. April 8, 2008. Retrieved December 28, 2015.
71. John Beasley, "Peanuts" *New Georgia Encyclopedia* (2019) online (<https://www.georgiaencyclopedia.org/articles/business-economy/peanuts/>)
72. "Peanuts in Canada" (<https://web.archive.org/web/20171207015440/http://www.peanutbureau.ca/all-about-peanuts/peanuts-in-canada.html>). *peanutbureau.ca*. Peanut Bureau of Canada. 2017. Archived from the original (<http://www.peanutbureau.ca/all-about-peanuts/peanuts-in-canada.html>) on December 7, 2017. Retrieved December 6, 2017.
73. Martinez-Carter, Karina (February 14, 2014). "As American as peanut butter" (<https://psmag.com/social-justice/american-peanut-butter-73234>). *psmag.com*. Pacific Standard. Retrieved December 6, 2017.
74. Smith, Andrew F. (2012). *Fast Food and Junk Food: An Encyclopedia of What We Love to Eat* (<https://books.google.com/books?id=7-WcKK01H1cC>). ABC-CLIO. p. 41. ISBN 978-0-313-39393-8.
75. "History of Peanuts & Peanut Butter" (<https://nationalpeanutboard.org/peanut-info/history-peanuts-peanut-butter.htm>). *nationalpeanutboard.org*. US National Peanut Board. 2017. Retrieved December 6, 2017.
76. "The history of peanut soup" (<http://thevirginiamarketplace.blogspot.ca/2012/09/peanut-soup-mix-considered-asouthern.html>). The Virginia Marketplace. September 19, 2012. Retrieved December 6, 2017.
77. "16 Fun Facts about Peanuts & Peanut Butter; Number 13" (<https://nationalpeanutboard.org/peanut-info/fun-facts.htm>). *nationalpeanutboard.org*. US National Peanut Board. 2017. Retrieved December 6, 2017.
78. Lee, M. J. (March 3, 2025). "USAID reinstates contracts for Georgia company that helps feed malnourished kids after Elon Musk responds to CNN reporting | CNN Politics" (<https://www.cnn.com/2025/03/03/politics/usaid-reinstates-contracts-for-georgia-company/index.html>). *CNN*. Retrieved March 3, 2025.
79. Raymond, Bret. "Rwaza Health Centre: Efficacy Study Results" (<https://web.archive.org/web/20120118120743/http://mananutrition.org/img/uploads/MANA-Report-final.pdf>) (PDF). *mananutrition.org*. MANA Nutrition. Archived from the original (<http://mananutrition.org/img/uploads/MANA-Report-final.pdf>) (PDF) on January 18, 2012. Retrieved July 15, 2011.
80. "Meds & Food For Kids :: — Medika Mamba" ([https://web.archive.org/web/20100408043914/http://mfkhaiti.org/index.php/the\\_solution/medika\\_mamba](https://web.archive.org/web/20100408043914/http://mfkhaiti.org/index.php/the_solution/medika_mamba)). *mfkhaiti.org*. Archived from the original ([http://mfkhaiti.org/index.php/the\\_solution/medika\\_mamba/](http://mfkhaiti.org/index.php/the_solution/medika_mamba/)) on April 8, 2010. Retrieved April 23, 2010.
81. Heuzé V., Thiollet H., Tran G., Lebas F., 2017. Peanut forage. Feedipedia, a program by INRA, CIRAD, AFZ, and FAO. <https://www.feedipedia.org/node/695> Archived (<https://web.archive.org/web/20170824174944/https://www.feedipedia.org/node/695>) August 24, 2017, at the Wayback Machine
82. Deshpande, S. S. (2000). *Fermented Grain Legumes, Seeds and Nuts* (<https://books.google.com/books?id=xq5Nxd7v5MC&q=Preparation+of+groundnut+cake&pg=PA73>). Food & Agriculture Org. ISBN 9789251044445. Retrieved May 25, 2015.
83. Onwudike, O.C. (November 1986). "Palm kernel meal as a feed for poultry. 1. Composition of palm kernel meal and availability of its amino acids to chicks" (<https://linkinghub.elsevier.com/retrieve/pii/0377840186901082>). *Animal Feed Science and Technology*. **16** (3): 179–186. doi:10.1016/0377-8401(86)90108-2 ([https://doi.org/10.1016/0377-8401\(86\)90108-2](https://doi.org/10.1016/0377-8401(86)90108-2)).
84. "3. Feed values and feeding potential of major agro-byproducts" (<https://web.archive.org/web/20150528215615/http://www.fao.org/wairdocs/ilri/x5480e/x5480e03.htm>). *fao.org*. Archived from the original (<http://www.fao.org/wairdocs/ilri/x5480e/x5480e03.htm>) on May 28, 2015. Retrieved May 25, 2015.
85. Heuzé V., Thiollet H., Tran G., Bastianelli D., Lebas F., 2017. Peanut seeds. Feedipedia, a program by INRA, CIRAD, AFZ, and FAO. <https://www.feedipedia.org/node/55> Archived (<https://web.archive.org/web/20170824180241/https://www.feedipedia.org/node/55>) August 24, 2017, at the Wayback Machine
86. Heuzé V., Thiollet H., Tran G., Edouard N., Bastianelli D., Lebas F., 2017. Peanut hulls. Feedipedia, a program by INRA, CIRAD, AFZ, and FAO. <https://www.feedipedia.org/node/696> Archived (<https://web.archive.org/web/20170824215328/https://www.feedipedia.org/node/696>) August 24, 2017, at the Wayback Machine


## Further reading

- Beasley, John (2019). "Peanuts" (<https://www.georgiaencyclopedia.org/articles/business-economy/peanuts/>). *New Georgia Encyclopedia*; 49% of the American peanut crop is grown in the state of Georgia.
- Cumo, Christopher, ed. (2015). *Foods That Changed History: How Foods Shaped Civilization from the Ancient World to the Present* (<https://archive.org/details/foodsthatchanged0000cumo>). Facts on File.
- Hammons, R. O. (1994). "The origin and history of the groundnut" in *The groundnut crop: a scientific basis for improvement*. Springer Netherlands. pp. 24–42.
- Hughes, Meredith Sayles (1999). *Spill the Beans and Pass the Peanuts: Legumes*. Lerner.
- Johnson, Sylvia A. (1997). *Tomatoes, Potatoes, Corn, and Beans: How the Foods of the Americas Changed Eating around the World* (<https://archive.org/details/tomatoespotatoes00john>). Atheneum Books.
- Krampner, Jon (2013). *Creamy and Crunchy: An Informal History of Peanut Butter, the All-American Food*. Columbia University Press.
- Singh, B., and U. Singh (1991). "Peanut as a Source of Protein for Human Foods" ([http://oar.icrisat.org/4992/1/PlantFoodsforHumanNutrition\\_41\\_2\\_165-177\\_1991.pdf](http://oar.icrisat.org/4992/1/PlantFoodsforHumanNutrition_41_2_165-177_1991.pdf)). *Plant Foods for Human Nutrition* 41:165–177.

- Skolnick, Helen S., et al. (2001). "The Natural History of Peanut Allergy" (<https://cdr.lib.unc.edu/downloads/sb397b298>). *Journal of Allergy and Clinical Immunology*. 107.2:367–374.
- Smith, Andrew F. (2002). *Peanuts: The Illustrious History of the Goober Pea*. University of Illinois Press.
- Smart, J. (1994). *The Groundnut Crop: A Scientific Basis for Improvement*. Chapman and Hall.
- United States Bureau of Agricultural Economics (1947). *Peanuts in Southern Agriculture* (<https://archive.org/details/peanutsinsouther65unit/page/n2/mode/1up>).
- Variath, Murali T., and P. Janila (2017). "Economic and Academic Importance of Peanut" (<http://oar.icrisat.org/10492/1/Economic%20and%20Academic%20Importance.pdf>). *The Peanut Genome* pp. 7–26.

## External links

---

-  [Peanut](#) at the Wikibooks Cookbook subproject
- 

Retrieved from "<https://en.wikipedia.org/w/index.php?title=Peanut&oldid=1319575834>"