[Template:Redirect](/wiki/Template:Redirect" \o "Template:Redirect) [Template:Taxobox](/wiki/Template:Taxobox)

***Manihot esculenta*** ([commonly called](/wiki/Common_name) **cassava** ([Template:IPAc-en](/wiki/Template:IPAc-en)),<ref name=GRIN>[Template:Cite web](/wiki/Template:Cite_web)</ref> **Brazilian arrowroot**,<ref name=GRIN/> **manioc**,<ref name=GRIN/> [**tapioca**](/wiki/Tapioca),<ref name=GRIN/>*ދަނދިއަލުވި****,***[***Template:Huh***](/wiki/Template:Huh)[***[1]***](#cite_note-1) ***in The Maldives and*** *yuca****) is a woody*** [***shrub***](/wiki/Shrub) ***native to South America of the*** [***spurge***](/wiki/Spurge) ***family,*** [***Euphorbiaceae***](/wiki/Euphorbiaceae)***. It is extensively cultivated as an annual*** [***crop***](/wiki/Agriculture) ***in*** [***tropical***](/wiki/Tropical) ***and*** [***subtropical***](/wiki/Subtropical) ***regions for its edible*** [***starchy***](/wiki/Starch)[***tuberous root***](/wiki/Tuberous_root)***, a major source of*** [***carbohydrates***](/wiki/Carbohydrate)***. Though it is often called*** *yuca* ***in Spanish and in the United States, it differs from the*** [***yucca***](/wiki/Yucca)***, an unrelated fruit-bearing shrub in the family*** [***Asparagaceae***](/wiki/Asparagaceae)***. Cassava, when dried to a powdery (or pearly) extract, is called tapioca; its fermented, flaky version is named*** [***garri***](/wiki/Garri)***.***

Cassava is the third largest source of food carbohydrates in the tropics, after [rice](/wiki/Rice) and [maize](/wiki/Maize).[[2]](#cite_note-2)[[3]](#cite_note-3) Cassava is a major [staple food](/wiki/Staple_food) in the developing world, providing a basic diet for over half a billion people.[[4]](#cite_note-4) It is one of the most drought-tolerant crops, capable of growing on marginal soils. Nigeria is the world's largest producer of cassava, while Thailand is the largest exporter of dried cassava.

Cassava is classified as either sweet or bitter. Like other roots and tubers, both bitter and sweet varieties of cassava contain [antinutritional](/wiki/Antinutrient) factors and toxins, with the bitter varieties containing much larger amounts.[[5]](#cite_note-5) They must be properly prepared before consumption, as improper preparation of cassava can leave enough residual [cyanide](/wiki/Cyanide) to cause acute cyanide intoxication,[[6]](#cite_note-6) [goiters](/wiki/Goiter), and even [ataxia](/wiki/Ataxia) or partial paralysis.[[7]](#cite_note-7) The more toxic varieties of cassava are a fall-back resource (a "food security crop") in times of famine in some places.[[8]](#cite_note-8) Farmers often prefer the bitter varieties because they deter pests, animals, and thieves.[[9]](#cite_note-9)

## Description[[edit](/index.php?title=(none)&action=edit&section=1)]

The cassava root is long and tapered, with a firm, homogeneous flesh encased in a detachable rind, about 1 mm thick, rough and brown on the outside. Commercial [varieties](/wiki/Variety_(botany)) can be [Template:Convert](/wiki/Template:Convert) in [diameter](/wiki/Diameter) at the top, and around [Template:Convert](/wiki/Template:Convert) long. A woody vascular bundle runs along the root's [axis](/wiki/Coordinate_axis). The flesh can be chalk-white or yellowish. Cassava roots are very rich in [starch](/wiki/Starch) and contain significant amounts of calcium (50 mg/100g), phosphorus (40 mg/100g) and vitamin C (25 mg/100g). However, they are poor in [protein](/wiki/Protein) and other [nutrients](/wiki/Nutrient). In contrast, cassava leaves are a good source of protein (rich in lysine) but deficient in the [amino acid](/wiki/Amino_acid) [methionine](/wiki/Methionine) and possibly [tryptophan](/wiki/Tryptophan).[[10]](#cite_note-10)[Template:Multiple image](/wiki/Template:Multiple_image) [Template:Clear left](/wiki/Template:Clear_left)

## History[[edit](/index.php?title=(none)&action=edit&section=2)]

[thumb|Yuca in Moche culture, 100 AD,](/wiki/File:Yucamuseolarco.jpg) [Larco Museum Collection](/wiki/Larco_Museum)

Wild populations of *M. esculenta* subspecies *flabellifolia*, shown to be the progenitor of domesticated cassava, are centered in west-central Brazil, where it was likely first domesticated more than 10,000 years [BP](/wiki/Before_Present).[[11]](#cite_note-11) Forms of the modern domesticated species can also be found growing in the wild in the south of [Brazil](/wiki/Brazil). By 4,600 BC, manioc pollen appears in the [Gulf of Mexico](/wiki/Gulf_of_Mexico) lowlands, at the [San Andrés](/wiki/San_Andrés_(Mesoamerican_site)) archaeological site.[[12]](#cite_note-12) The oldest direct evidence of cassava cultivation comes from a 1,400-year-old [Maya](/wiki/Maya_civilization) site, [Joya de Cerén](/wiki/Joya_de_Cerén), in [El Salvador](/wiki/El_Salvador).[[13]](#cite_note-13) With its high food potential, it had become a [staple food](/wiki/Staple_food) of the native populations of northern South America, southern Mesoamerica, and the Caribbean by the time of the Spanish conquest. Its cultivation was continued by the colonial Portuguese and Spanish.

Cassava was a staple food for [pre-Columbian](/wiki/Pre-Columbian) peoples in the Americas and is often portrayed in [indigenous art](/wiki/Pre-Columbian_art). The [Moche](/wiki/Moche_(culture)) people often depicted yuca in their ceramics.[[14]](#cite_note-14) Mass production of Casabe bread became the first Cuban industry established by the Spanish <https://books.google.ca/books?id=Rn9LZ2XrIWgC&pg=PA75&lpg=PA75&dq=casabe+primera+industria+cubana&source=bl&ots=3x9USw_LG7&sig=LH07V31uHYpwbZpKXTvCBuxnULs&hl=en&sa=X&ved=0CB0Q6AEwAGoVChMI1Kal4ey3xwIVDUySCh32KQ2i#v=onepage&q=casabe%20primera%20industria%20cubana&f=false>. Ships departing to Europe from Cuban ports such as Havana, Santiago, Bayamo and Baracoa not only carried goods to Spain. The Spanish also needed to replenish their boats with dried meat, water, fruit and large amounts of casabe bread <http://www.sjsu.edu/faculty/watkins/havana.htm>. Cuban weather was not suitable for wheat planting and casabe would not go stale as quickly as regular bread.

Cassava was introduced to Africa by Portuguese traders from Brazil in the 16th century. [Maize](/wiki/Maize) and cassava are now important staple foods, replacing native African crops.[[15]](#cite_note-15) Cassava is sometimes described as the 'bread of the tropics'[[16]](#cite_note-16) but should not be confused with the tropical and equatorial [bread tree](/wiki/Bread_tree) *(Encephalartos)*, the [breadfruit](/wiki/Breadfruit) *(Artocarpus altilis)* or the [African breadfruit](/wiki/African_breadfruit) *(Treculia africana)*.

## Economic importance and production{{anchor|Production}}[[edit](/index.php?title=(none)&action=edit&section=3)]

[Template:See also](/wiki/Template:See_also)

[thumb|200px|A cross-section of cassava](/wiki/File:Manihot_esculenta_-_cross_section_2.jpg) World production of cassava root was estimated to be 184 million [tonnes](/wiki/Tonne) in 2002, rising to 230 million tonnes in 2008.[[17]](#cite_note-17) The majority of production in 2002 was in [Africa](/wiki/Africa), where 99.1 million tonnes were grown; 51.5 million tonnes were grown in [Asia](/wiki/Asia); and 33.2 million tonnes in [Latin America](/wiki/Latin_America) and the [Caribbean](/wiki/Caribbean), specifically [Jamaica](/wiki/Jamaica). [Nigeria](/wiki/Nigeria) is the world's largest producer of cassava. However, based on the statistics from the FAO of the [United Nations](/wiki/United_Nations), [Thailand](/wiki/Thailand) is the largest exporting country of dried cassava, with a total of 77% of world export in 2005. The second-largest exporting country is [Vietnam](/wiki/Vietnam), with 13.6%, followed by [Indonesia](/wiki/Indonesia) (5.8%) and [Costa Rica](/wiki/Costa_Rica) (2.1%).

In 2010, the average yield of cassava crops worldwide was 12.5 tonnes per hectare. The most productive cassava farms in the world were in [India](/wiki/India), with a nationwide average yield of 34.8 tonnes per hectare in 2010.[[18]](#cite_note-18) Cassava, [yams](/wiki/Yam_(vegetable)) ([*Dioscorea*](/wiki/Dioscorea) spp.), and [sweet potatoes](/wiki/Sweet_potato) (*Ipomoea batatas*) are important sources of food in the tropics. The cassava plant gives the third-highest yield of [carbohydrates](/wiki/Carbohydrates) per cultivated area among crop plants, after [sugarcane](/wiki/Sugarcane) and [sugar beets](/wiki/Sugar_beet).[[19]](#cite_note-19)