

AVOCADO



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Origins: The avocado, or avocado, is the fruit of a tree native to Mexico and Central America.

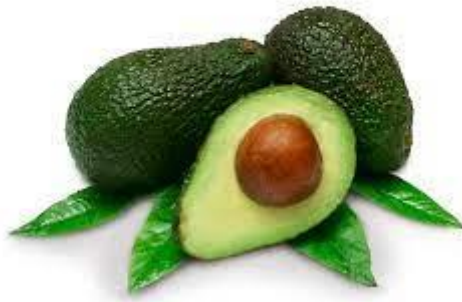
Before the arrival of the Spanish, its cultivation extended to what is now Colombia, Ecuador and Peru. The name of avocado or avocado, by which it is known in many Spanish-speaking countries, is an adaptation of *ahuácatl*, a word of Nahuatl origin, Mayan language. The first to mention avocado in a written document was Martín Fernández de Enciso, in his work *Suma de Geografía*, published in 1519. Pedro de Cieza's chronicles also refer to the abundant quantity of avocados found in the area of Colombia and in the Ecuadorian coast.

About how it got to Peru, it is believed that avocado production in Peru dates back to the 15th century, after the Inca conquest of the town called Palta. The Peruvian mestizo chronicler Garcilaso Inca de la Vega, in his *Royal Commentaries on the Incas*, recounts how Túpac Inca Yupanqui, upon conquering the southern area of Ecuador where the native group of Avocados lived, brought to Cuzco "that delicious fruit called Avocado ". Apparently, that is the origin of the name given to it in Peru, and also the approximate time in which it arrived in our lands, between the years 1450 and 1475. In addition, the chronicler, scientist and priest Bernabé Cobo in *Histories of the New World* (work completed in 1653) writes: "The avocado is so called in the general language of Peru, which in most of the Indies they name it avocado, which is the name given to it by the Indians of the Spanish island ". The Spanish (they called it "Indian pear" because of its appearance), brought the avocado to Europe in the 16th century, along with other new foods discovered in the first expeditions to America, such as potatoes, corn, some tropical fruits. and the Chocolate. Today it is one of the most popular tropical fruits in the world due to its high nutritional value, pleasant taste, versatility and easy preparation.

The Hass avocado, currently the most important variety in the world, is a hybrid between Mexican and Guatemalan race, and it originated in 1926 in La Habra Heights, California, when a graft did not take hold and the pattern or rootstock grew and fructified; The owner of the tree, Rudolph Hass noticed the good characteristics of the fruits and obtained a patent in 1935, however Rudolph did not obtain significant benefits, since it was the first time that a patent was granted on a tree, and it was not respected. The vegetative material or shoots of that first Hass tree, was what gave rise to all the other Hass variety trees.

Varieties

- **Hass:** It is a variety achieved in the state of California. Its fruits are oval pyriform, medium size (200 to 300 gr.), Excellent quality. The peel is granular, medium thick, peels easily and changes from green to purple as it matures. The pulp has no fiber and its oil content fluctuates between 18 and 22%. The seed is small in size, spherical in shape and attached to the pulp. The fruit can remain on the tree for a certain time after reaching maturity, without losing its quality. The tree is very sensitive to cold and high productivity. It is the most important variety in the markets, resisting transport and storage quite well.



- **Lamb Hass:** The fruit is very similar to Hass although with broader shoulders, turning its skin color to black when ripe. Larger in size than Hass and later harvesting. The production of this variety is higher and the tree more tolerant to winds, high temperatures and crystalline mite than Hass.



- **Mendez Hass:** The most notable virtue of this variety is its long harvest period, thanks to the fact that it has a summer-autumn flowering, which generates a harvest that coincides with the low production season of Hass. With proper management, this fruit will have its first harvests two years after sowing. It has been observed to respond well in warm terrain with altitudes of up to 1,800 meters above sea level. You need supportive water in the dry months.



- **Maluma Hass:** Of South African origin, this variety of avocado is highly productive, with large and homogeneous sizes. The tree is of medium vigor, pyriform and triangular in shape, formed in an ascending central branch, from which small branches emerge at 360°. Annual light pruning should be carried out and poking out at 4 meters. This avoids stronger pruning such as those that have to be done to Hass from time to time, which result in a decrease in harvest the following year.



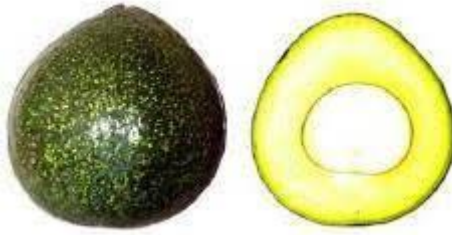
- **Strong:** This avocado comes from the bud taken from a native tree in Atlixo (Mexico), it has intermediate characteristics between the Mexican and Guatemalan races. The fruits have a pyriform appearance, of medium size (180 to 400 gr.). Its average length is 10 to 12 cm. and its width from 6 to 7 cm. The rind is slightly rough to the touch, it separates easily from the meat, medium thick, green in color and greenish in consistency. The quality of the pulp is good; the fruits have little fiber and medium-sized seeds, their oil content varying between 18 and 26%.



- **Ettinger:** The fruit is elongated oval shape, medium size, thin, smooth and bright green skin. The pulp has no fiber and is of very good quality.



- **Nabal:**Originally from Israel. Almost round variety, with a light green and smooth skin. Its shape is what distinguishes it from the others. The shell is hard and woody, making it last for a long time. It has the lowest fat content of all avocados (between 6 and 8%).



- **Edranol:**The tree is of medium development. The fruits are pyriform, rough green skin and medium size (260 to 300 gr.). The pulp has a good flavor and an oil content of 22%.



- **Bacon:**Originally from California and with good resistance to cold. The fruit is oval in shape, medium in size (250 to 300 gr.) And has a thin, shiny green skin.



- **Black of the Cross:** Known as Prada or Vicencio. It possibly originated in Olmué by natural hybridization, in which there could be some influence of the Mexican variety Leucaria, whose wide undulating foliage it resembles. It could therefore be considered as a Mexican Guatemalan hybrid. It is a fast growing tree, precocious, very loaded and with fragile wood, so it is not uncommon for its branches to break easily. The fruit is pear-shaped, with a purple to black skin.



- **Avocado Gwen:** New variety launched in California with great expectation, it comes from the "Hass" in the same way as the "Whitsell". The tree has a vegetative habit, it tends to grow in altitude, however, its abundant vegetation acts in the sense of counteracting this tendency. The productivity seems to be somewhat higher than that of the "Hass", it is considered that it can double it and the entry into fruiting of the young trees is faster. The ripening season coincides with that of the "Hass". The ripening season coincides with that of the "Hass". The fruit has characteristics similar to those of said cultivar but about 40-60 g. its fruit is larger, slightly more oval, its pulp being more accentuated with almond taste, compared to "Hass" and other cultivars.



- **Zutano:** This fruit is easy to recognize due to its shiny appearance, it has an oval pear shape, it has a thin light green skin, it has a mild flavor, and its pulp is pale green. It has a medium to large size, reaching 200 and 400 grams, it is not of great quality like Hass, but it does ripen early at the beginning of winter. It is a category B hybrid and is more resistant to low temperatures.



- **Esther (Esther):** Round Large and good-tasting, large in size, grainy green skin (between Strong and Hass). Stages of the year: Between April, May and June.



- **Avocado Reed:** Long and round fruit available in the summer months. Round in shape and medium-sized seed. Good taste. Its size from medium to large. Between 8-18 oz. Thick green skin with little graininess. Their is buttery. They are harvested from summer to early fall.



- **Pinkerton:** Small seed. Long oval and small seed. Excellent peeling characteristics. Very good taste. Size: Long. Ranges between 8-18 oz. Its skin is medium thick and its pulp is creamy and pale green in color. The green color of the skin darkens as it matures. Sensitive to pressure when maturing. Available from winter to spring.

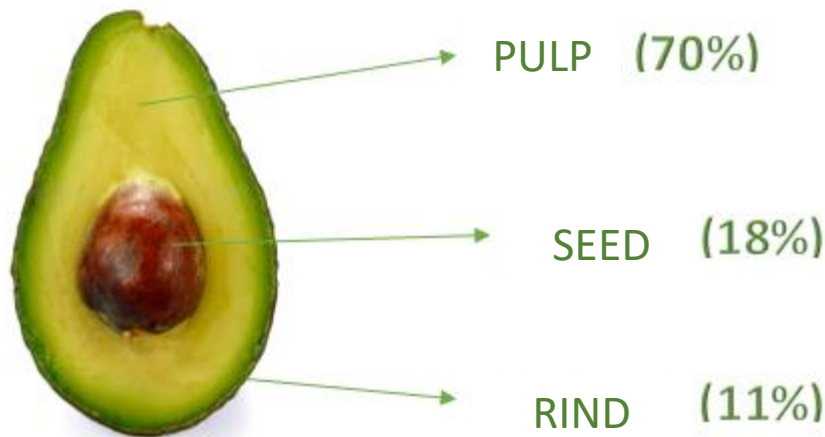


Varieties Grown in Peru: The Hass and Fuerte types are grown mainly for export purposes. Hass avocado is the most commercial crop in the world due to its creamy pulp that gives it a great flavor. This variety is adapted to develop in the coastal and jungle area of Peru, it also has a high level of resistance and an excellent degree of conservation when transported. The Fuerte avocado variety presents an alternate production, with periods of low harvest. The strong avocado season begins in January and ends in March, while the Hass avocado is available from March to June. The other varieties that are grown for export purposes are: Zutano, Ettinger, Nabal and Creole, in lower percentages (Criolla, Villacampa, Collinred, Dickinson, Hall, Linda, Queen,

According to the Ministry of Agriculture and Irrigation (2017), in Peru avocados can be produced throughout the year; but it is between the months of April-July the largest block of seasonal production; This is why the highest production volumes are reached between the second and third quarters of the year. Likewise, according to the studies carried out, Peru has been increasing its harvest area in recent years, reaching 6th place in relation to the world ranking (MINAGRI, 2015).

In this regard, Salvador and Paucar (2019) in their study point out that, in 2017, Peruvian avocado production exceeded 470 thousand tons, of which 53% was destined for export, which is why Peru managed to position itself as the second supplier of avocados (in volume) in the world (Peruvian Association of Avocado Producers of Peru, 2018). Likewise, they conclude that, thanks to current technology, it is possible to take advantage of those avocados that are discarded for not meeting the weight requirements, etc. ; In this sense, in the case of Hass avocado, it can be used in the elaboration of pulp and oils, thus generating products with added value, which allow obtaining greater income for producers and companies, the production of this product has increased, reaching at an average annual rate of 10.5% in the period 2001-2018, being the region of La Libertad the Alberto Pantaleón that concentrates the highest percentage produced (41%). (ADEX Global Business and Economics Research Center, 2019).

Composition and nutritional values



- **Fatty acids:** They are a source of energy and help regulate body temperature, protect vital organs such as the heart and kidneys, and transport fat-soluble vitamins (A, D, E, K) facilitating their absorption. Fat is essential for the formation of certain hormones and supplies essential fatty acids that the body cannot synthesize and that must necessarily be obtained from the daily diet.
- **Fiber:** It contributes to the elimination of certain harmful substances such as cholesterol or certain bile salts, and contributes to the reduction of glucose and fatty acids in the blood. For this reason, foods rich in fiber are essential in a diet that is excessively rich in carbohydrates, proteins or fats.
- **Vitamin B6 (or pyridoxine):** It favors the formation of red blood cells, blood cells and hormones, it intervenes in the synthesis of carbohydrates, proteins and fats, and it collaborates in the maintenance of the nervous and immune systems in perfect condition, indirectly participating in the production of antibodies. Vitamin B6 also reduces estrogen levels, thus relieving pre-menstruation symptoms, and stabilizing blood sugar levels during pregnancy. It also prevents the formation of calcium oxalate stones or stones in the kidney.
- **Potassium:** Together with sodium, it is responsible for regulating the acid-base balance and the concentration of water in blood and tissues. The concentrations of these two elements inside and outside the cells of our body generate an electrical potential that promotes muscle contractions and the nerve impulse, with special relevance in cardiac activity.
- **Calories:** They favor the maintenance of vital functions and body temperature of our body, as well as the development of physical activity, while providing energy to combat possible diseases or problems that the body may present. The excess of calories is only recommended in special circumstances such as times of growth and cell renewal, and in people who perform intense physical activity or suffer from stressful situations such as illness or recovery after surgery.
- **Water (67.90%):** It favors the hydration of our organism.

Production areas and exportable supply

La Libertad, Lima, Lambayeque and Ica are the main regions where Hass avocado is produced, and these areas concentrate 83% of the country's productive hectares. In the last 3 years, there has been an increase in these lands to the south: Huancavelica, Ayacucho and Cusco went from 1100 to 2000 hectares (95% of the production of this type of avocado is exported). According to the SIEA database of Midagri, the avocado harvest in 2020 was 46,780 hectares, which is equivalent to a decrease of 0.04% compared to 2019.

Avocado production in Peru takes place from March to September of each year and during 2021, Senasa has certified a total of 6,065 farms. Of the latter, 88% correspond to farms smaller than 5 hectares and 73% to farms smaller than 2 hectares. The regions where the largest number of small avocado producers are concentrated are: Ayacucho, Ancash, Lima, Arequipa, Apurímac and Huancavelica, regions that work jointly with Senasa to certify their production fields. This fruit is also produced in eleven other regions of the country.

From January to July 2021, 441,246 tons of avocado have been exported; which represents a growth of 25% compared to what was exported in the same season of 2020. As a result of international negotiations and negotiations, the Peruvian avocado can enter 65 markets in the world, with the Hass variety being the most exported, representing 90% of total exports.



Uses and presentations: An insights study for PROMPERÚ on avocado revealed that in France, Spain and the United Kingdom this product is related to a healthy diet, and as a very versatile fruit that can be complemented with products such as eggs, tomatoes, blueberries or salmon, either in breakfast, lunch and dinner, and even with a daily frequency. On the other hand, PROMPERÚ is conducting technological surveillance monitoring. The study carried out by Bioactiva confirms that despite the pandemic the consumption of this product has grown. In addition, the application of new technologies can be seen throughout the avocado value chain, from the development of new plant varieties to packaging technologies to preserve food, without losing its nutritional properties.

The main technological fields are the following: cosmetics or similar for toilet (23%); skin care preparations (11%); medicinal preparations containing organic active ingredients (8%); hair care preparations (8%); mutation or genetic engineering (7%) and biocides (6%). All these fields represent 63% of all avocado-related technologies.

The pulp is directed to food production, while the seed to cosmetology, to extract essential oils. A technology developed by the Autonomous University of Mexico that consists of a bioplastic with an extract of the avocado peel stands out, as an alternative to the use of plastic in the conservation of strawberries. Also, the development of biodegradable cutlery made with this fruit, aimed at caring for the environment.

Avocado-derived processed products include snacks, oils, mayonnaise, guacamoles, freeze-dried avocado, sauces, dressings, ready-to-mix shakes, non-perishable mixes, snacks, and chip flavorings. It also encompasses puree, beverages, freeze-dried avocado pulp powder, freeze-dried guacamole powder, and avocado honey.