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UNIVERSIDAD NACIONAL AGRARIA
LA MOLINA

NATURAL PRODUCTS OF THE PERUVIAN AMAZON

HEALTHY, QUALITY AND SAFETY

PERU-Hub | Peruvian Extension and Research Utilization

Alianza

Bioversity International

CIAT
Centro Internacional de Agricultura Tropical
Desde 1967 Ciencia para cultivar el cambio

The UNIVERSITY of OKLAHOMA

PURDUE UNIVERSITY

UtahState University

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PERU-Hub is an initiative of La Molina National Agrarian University (UNALM) and the United States Agency for International Development (USAID), in alliance with The University of Oklahoma, Purdue University, Utah State University, and the international research center Bioversity-CIAT.

This institutional hub is dedicated to establishing a center of excellence, leveraging research for technology transfer and crop diversification. PERU-Hub fosters new crops and entrepreneurships, connecting farmers and food producers to markets. This collective effort is at the forefront of driving innovation, sustainable development and fair trade, engaging women and native communities.

While La Molina University is located in Lima, PERU-Hub is situated in the vibrant city of Tarapoto, within the Amazonian province of San Martín. Additionally, through other La Molina and USAID development initiatives, PERU-Hub has the capacity to increase its portfolio of products.

To date, November 2023, all the products featured in this publication are currently in different developmental stages under the guidance of PERU-Hub.

Indigenous communities

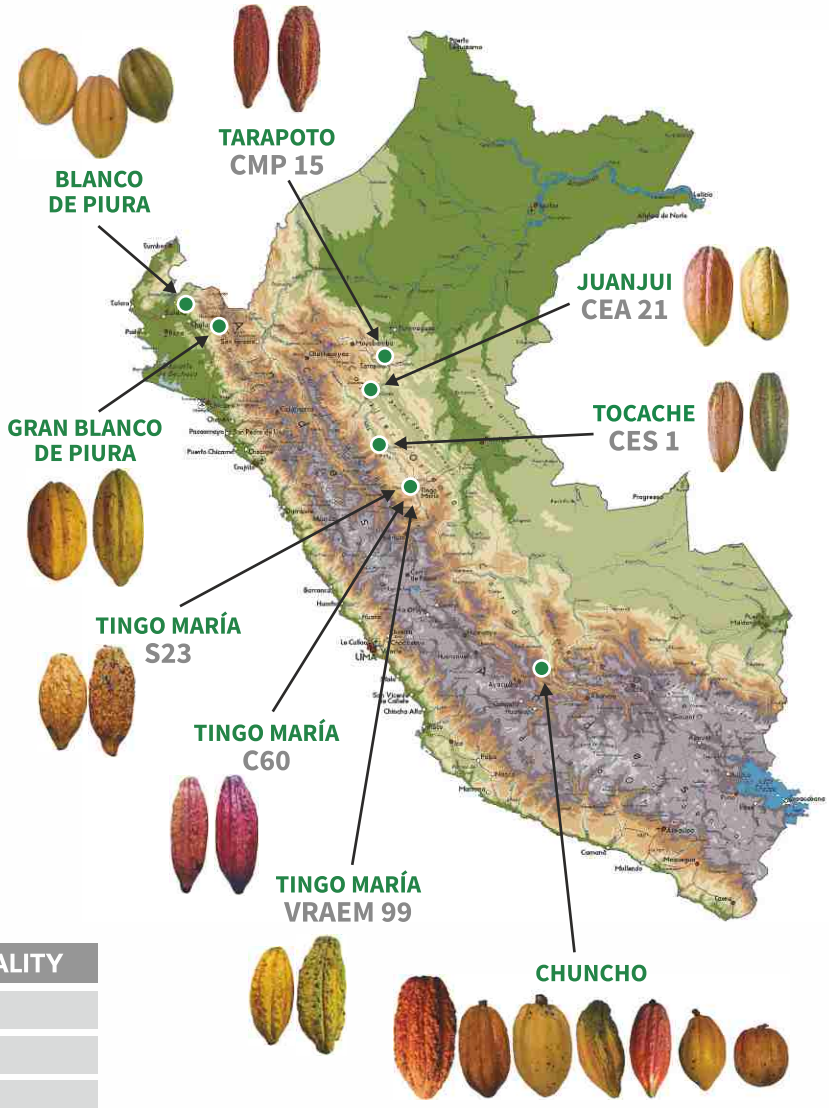
Peru boasts a rich tapestry of 54 indigenous communities, with San Martín ranking as the first region in terms of the number of indigenous populations. These communities represent four linguistic families, namely Awajún, Kichwa, Shawi, and Yaminahua. Spread across 9 out of its 10 provinces, the indigenous population in the region adds to its cultural diversity. PERU-Hub actively engages with indigenous communities in San José de Sisa, located in El Dorado province of San Martín. Through the implementation of Field Schools, designed for the training of farmers and producers, the project works towards fortifying their capacities with their present crops, and preparing them for crop diversification, ultimately leading to increase their family income.

The PERU-Hub project is not just an endeavor in sustainable development; it is a commitment to preserving the unique biodiversity of the Peruvian Amazon while empowering women and local communities. We look forward to the continued success and positive impact of this initiative on both the environment and the people it serves.

FINE AROMA COCOA

Cocoa *(Theobroma cocoa L.)* is a tropical Malvaceae tree, native to the Amazon basin of South America. Cocoa was domesticated around 5,000 years ago, between south-eastern Ecuador and Montegrande, Jaen, Peru. Cocoa varieties are traditionally classified as Criollo, Forastero and Trinitario. Forastero encompassed a range of cocoa types, with more than 15 genetic groups known mostly as Fine Flavor Cocoa.

PERU-Hub is characterizing the Fine Flavor Cocoa, using qualitative and quantitative parameters. Twelve outstanding award-winning clones cropped in the Peruvian Amazon have been identified to perform chemical (Purdue) and sensory (UNALM) analysis of the beans to identify the high quality characteristics that differentiate them; and for subsequent processing into high quality chocolate and other products.



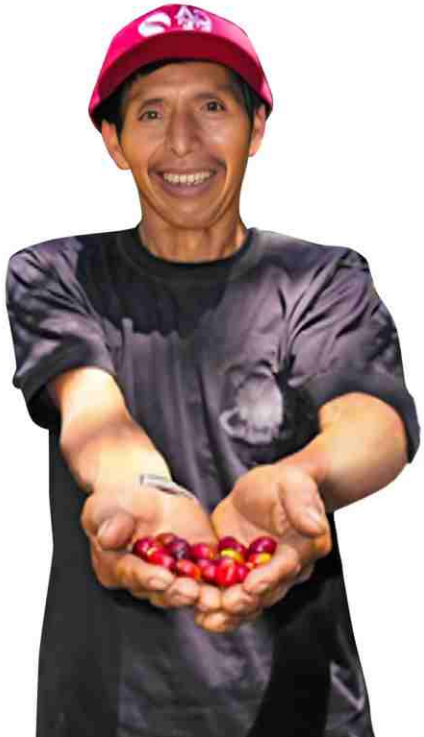
Fine Flavor Cocoa Clones Studied by PERU-Hub

CLONE	LOCATION	SENSORY QUALITY
CEA 21	JUANJUI	Herbal
S23	TINGO MARÍA	Herbal
C60	TINGO MARÍA	Fruity
CES 1	TOCACHE	Fruity
CMP 15	TARAPOTO	Flowery
VRAEM 99	TINGO MARÍA	Herbal and Flowery

COFFEE

The great diversity of ecological conditions existing in Peru has resulted in sixteen different regions producing high quality coffee, each one with its unique sensory profile. These profiles vary from notes of jasmine flower to rose tea and chamomile; smells of red or berry fruits, pineapple, citrus, apple or peach, with a base of walnuts and hazelnuts or cinnamon, or vanilla, caramelized or honey. The acidity of these coffees ranges from medium to high, depending on the variety and the region.

The Coffee Alliance for Excellence (CAFÉ) is an initiative of USAID - TechnoServe, whose objective is to improve the living conditions of 10,000 small coffee producers through increases in productivity and income, improving the quality of their coffee and its articulation to the market, in an inclusive and socially and environmentally sustainable way. This initiative carried out sensory analyzes of specialty coffees in different producing regions of the country, having identified coffees with distinctive quality attributes, originating from the special soils and climates of each region, and from the particular care and effort of each producer.



PASSION FRUIT

Passion fruit *(Passiflora edulis)* is a crop native to tropical South America. The fruit is round to oval, 4 to 8 cm in diameter, yellow or dark purple when ripe, with a soft to firm texture, sweet, acidic and juicy, filled with numerous seeds.

The juice has a characteristic and pleasant aroma, which is used alone or added to fruit juices to enhance the aroma. It is considered a good source of vitamin A (beta-carotene). Its vitamin C (ascorbic acid) content is similar to other citrus fruits (30 mg/100 g of juice).

FROZEN PASSION FRUIT JUICE

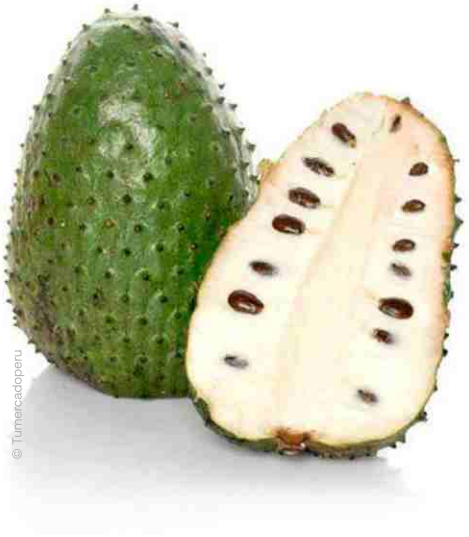
Passion fruit juice is obtained from healthy, fresh and ripe fruits, through a mechanical extraction process, refined, pasteurized, cooled and frozen for conservation, with no additives or artificial preservatives. The product has a pH lower than 4.0 which limits the growth of pathogenic microorganisms.

PHYSICAL-ORGANOLEPTIC CHARACTERISTICS	
Color	Orange yellow, characteristic of passion fruit juice.
Flavor/Odor	Typical to the variety, free from any off-flavors and/or off-odors of any kind.
Texture	Refined juice, lump-free, liquid consistency, free from skins or other foreign matter.

PHYSICOCHEMICAL CHARACTERISTICS	
PARAMETERS	**RANGE:**
° Brix	Mín. 11
% Acidity (as citric acid)	Mín. 2.80
pH	2.5 – 3.0

SOURSOP

Soursop *(Annona muricata)* is a crop native to tropical America and the Caribbean. The fruit is called soursop because of its slightly acidic flavor when ripe. In South America is called guanabana (graviola in Brazil). Soursop is a low tree 6 to 8 meters high. The fruit is long, ovoid and green that can weigh up to 15 pounds. The pulp of the fruit is white, edible, juicy, acidic, aromatic, with some fiber and black seeds.



- The pulp is used to make fruit nectars, smoothies, fruit juices, candy and ice cream.
- Soursop pulp leaves are widely promoted as an alternative to treat cancer.

SOURSOP PULP

Natural product, not diluted or concentrated, without preservatives, obtained by a mechanical process of extraction and sieving of the edible fraction of ripe and healthy fruits. Naturally free of fat and cholesterol, low in sodium.

PHYSICAL-ORGANOLEPTIC CHARACTERISTICS	
COLOR	White, characteristic of the specie.
Flavor/Odor	Typical to the variety, free from any off-flavors and/or off-odors of any kind.
Texture	Pulp is homogeneous, free from peelor other foreign matter.

PHYSICOCHEMICAL CHARACTERISTICS	
PARAMETERS	RANGE:
° Brix	Mín. 13
% Acidity (as citric acid)	Mín. 0.5
pH	3.0 – 4.0

CAMU CAMU

Camu camu *(Myrciaria dubia)* is a fruit native of the Peruvian amazon. It grows naturally in alluvial soils that are flooded seasonally, but it is also cultivated in non flooding areas. Fruits are from red to purple red color and have the highest vitamin C content of the cropped fruits (2,994 mg ascorbic acid/100 g pulp). They also have a high citric acid content (900 to 1,400 mg/100 g pulp). It is an excellent source of natural vitamin C, vitamin B1 (Tiamine), vitamin B2 (Riboflavine) and vitamin B5 (Niacine).

FROZEN CAMU CAMU PULP

Camu camu is exported usually as frozen natural pulp with the following characteristics:

PHYSICAL-ORGANOLEPTIC CHARACTERISTICS	
COLOR	Yellowish to pink, c typical of the variety.
Flavor/Odor	Tart taste and is full of essential vitamins, minerals.
Texture	Pulp is homogeneous, free from skins or other foreign matter.
PHYSICOCHEMICAL CHARACTERISTICS	
° Brix	5.0 to 6.0
Vitamin C (as ascorbic acid)	1,800 mg/100 g
pH	2.5 to 3.0

VANILLA

Vanilla *(Vanilla planifolia)* is a member of the orchid family, a native of Gulf of Mexico. The first people to have cultivated it seem to have been the Totonacs of Mexico's east coast. Vanilla is a clonally propagated crop and grows as a vine, climbing up an existing tree (also called a tutor), pole, or other support. It can be grown in a forest (on trees), in a plantation (on trees or poles), or in a "nursery/greenhouse", which increase its productivity. Vanilla grows best in a hot, humid climate from sea level to an elevation of 1,500 m. The ideal climate has moderate rainfall, 1,500–3,000 mm. Most successful vanilla growing and processing is done in the region within 10 to 20° of the equator. The harvested green fruit can be commercialized as such or cured according to market.

CINNAMON

Cinnamon *(Cinnamomum verum)* is native to Ceylon (Sri Lanka), and is cultivated in the tropical regions for its bark. When a cinnamon tree is around two years old, farmers coppice or cut back, these shoots are used to make cinnamon. Once cut, the shoots are stripped of their bark and the peels are set out to dry in the sun (form sticks).

Cinnamon is usually sold in sticks form, and it is characterized by a sweet smell and light brown color, but also can be found in a variety of forms, the most common of which is ground and essential oils.

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