

Protected food, drink or agricultural product name

# Product specification for CAFÉ MACHU PICCHU - HUADQUIÑA

**A protected designation of origin (PDO)**

Responsible country: Peru

This document sets out the elements of the product specification for information purposes.

## Competent authority

The National Institute for the Defense of Competition and Protection of Intellectual Property (INDECOPI) is the Peruvian authority in charge of running the scheme of the appellations of origin and geographical indications.

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## Applicant group

Name: The Café Machu Picchu – Huadquiña's application was submitted by Cooperativa Agraria Cafetalera Huadquiña Ltda. N° 109, from Peru. However, it must be noted that according to the Peruvian legislation, the Peruvian State is the exclusive owner of the Peruvian appellations of origin or geographical indications.

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## Type of product (as in Annex XI Implementing Regulation 668/2014)

Class 1.8. Other products listed in Annex 1 to the treaty (spices etc).

# 1. Product name(s)

Café Machu Picchu - Huadquiña

## 2. Description

The product is characterized for being a product that has high values of lipids, proteins and ash. It is high in fiber and carbohydrates. These particularities are what explain why this coffee expresses an intense aroma, sweet acidity, balanced flavour, with a dense body (excellent body), and a long-lasting taste in the mouth.

*Coffea Arabica* L. is a self-pollinated species, that is, capable of self-fertilization and, in the designated geographical area, producers usually maintain a proportion of 80% of Typica variety plants, 10% of Catimor and the rest of the Caturra and Bourbon varieties. However, in almost all growing plots it is customary to keep the plants of the different varieties mixed, so that the cherries that are harvested and processed will result in a parchment and then a green coffee that is a mixture of all the varieties, where the one that predominates is Typica. This condition is an aspect that differentiates MACHU PICCHU HUADQUIÑA coffee from those that are grown in other places. In other geographical areas, such as "La Merced", there are areas with the Catimor and Caturra varieties (proportion 75% and 25%); in others it is Typica with Caturra (40% and 60%) being the proportion of Typica always lower. In the study of bromatological variables, samples from MACHU PICCHU HUADQUIÑA coffee were compared with coffee samples from other areas, such as "Quillabamba", "La Merced", "Pichanaki" and "Satipo", and the average values of the content of lipids, proteins, crude fiber, ash and carbohydrates were determined, which are components that can allow us to differentiate green and gold coffee grains by their origin and which will also determine their quality characteristics during the tasting tests. The study concludes that green coffee grains from the designated geographical area differ completely in:

A higher percentage in lipid content, 14.27%, versus 8.01%, 7.74%, 6.23% and 5.84% in the areas around Huadquiña, La Merced, Pichanaki and Satipo, respectively.

The protein, fiber and ash content present significantly high values compared to the contrast zones: 21.7%, 35.58%, and 5.77% in Huadquiña, versus 13.95%, 16.88%, 3.44% in the surroundings of Huadquiña; 13.90%, 18.88, 3.35% in La Merced; 10.77%, 15.78% and 2.96% in Pichanaki; and, finally, 12.04%, 16.65% and 3.06% in Satipo.

The total carbohydrate content in Huadquiña turned out to be the lowest with respect to the comparison places: 47.26% versus 63.59%, 64.02%, 69.04% and 68.05% in the surroundings of Huadquiña, La Merced, Pichanaki and Satipo, respectively.

In relation to the morphological characters of the green bean of CAFÉ MACHU PICCHU - HUADQUIÑA, it is characterized by having an average length of  $0.72 \pm 0.04$  cm, an average diameter of  $0.44 \pm 0.03$  cm, a thickness or average thickness of  $0.15 \pm 0.01$  cm. The weight of

100 green beans is  $21.17 \pm 1.70$  g and the average number of green beans in 100g was  $480.40 \pm 38.82$ .

About the granulometry of the green bean, the following is established:

Net graduation 16.

The humidity ranges in green bean are: Around 12% humidity.

The characteristics of colour and odour that the green bean must present are:

Colour that varies from homogeneous to uniform and with a fresh smell.

Therefore, it has been demonstrated that all the indicated factors are very important and make the production area a particular space, where they combine and allow coffee plants to express their grain quality characteristics. In addition, the organoleptic characteristics that give commercial value to coffee, such as: the body, aroma, smell, flavour, acidity, among others, are the result of the lipid oils contained in the grains that will be transformed into volatile aromatic compounds that will highlight the particular characteristics of coffee. Also, the density that gives body to this coffee is explained by its good supply of fibre and protein in the green grains, which increase its texture in the cup.

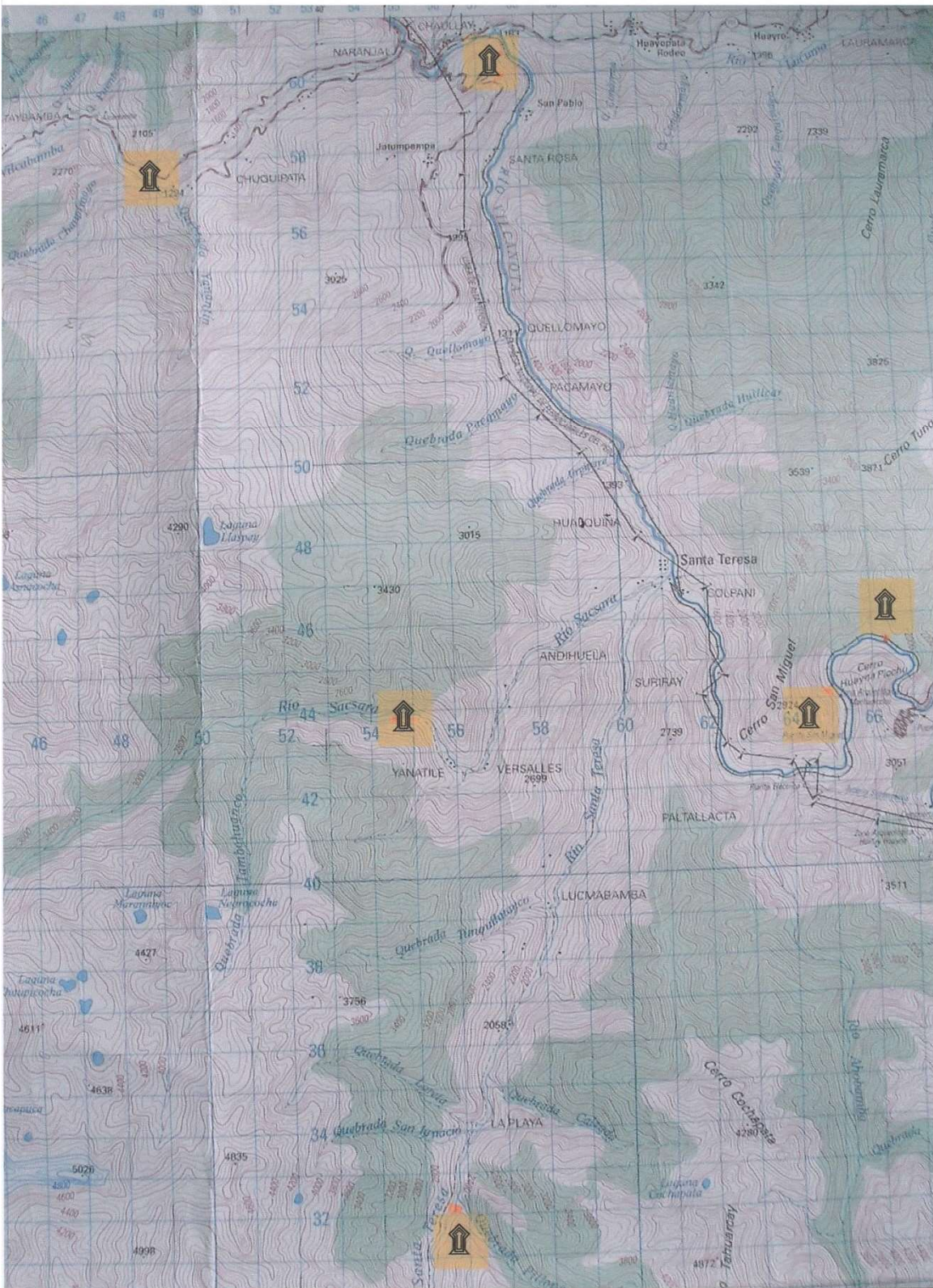
### **3. Geographical area**

The geographical area delimited for the cultivation and production of CAFÉ MACHU PICCHU - HUADQUIÑA comprises the territorial scope detailed below:

By the south, the coffee trees extend from the Pillone ravine, west longitude of the Greenwich Meridian  $72^{\circ}38.50'$  and south latitude  $13^{\circ}16.4'$ ; up to the height of Hatumpampa in the northern part, at the coordinates west longitude  $72^{\circ}37'49.0$  and south latitude  $13^{\circ}00'56.6''$ , encompassing several secondary basins of the Santa Teresa, Sacsara, Vilcabamba and Lucumayo rivers, all of which flow into the main basin of the Vilcanota river. Among all the mentioned basins, coffee trees are distributed on both riverbanks.

In the north from west to east, the coffee trees extend from the descent of the Viscachamayo ravine, continuing through the Chaupimayo ravine, to the Vilcanota basin and the junction with the Lucumayo river.

By the south-east, the crops are included from the Vilcanota basin, at the height of the archaeological zone of Machu Picchu; towards the south-west, plantations scattered along the banks of the Sacsara river can be found.



Map. Production area of the appellation of origin Café Machu Picchu - Huadquiña.

## 4. Proof of origin

Using his Knowledge and experience once the farmer considers that the beans are dry, he proceeds to place the parchment coffee beans in jute bags to transfer them to the

COOPERATIVA AGRARIA CAFETALERA HUADQUIÑA LTDA N° 109 plant and, from there to the CENTRAL DE COOPERATIVAS AGRARIAS CAFETALERAS COCLA LTDA. 281, where samples will be taken from each of the bags in a batch consisting of 8 to 10 bags.

Each farmer manages a **Producer's Notebook** where he records all the activities he carries out on a daily basis.

The bags containing the parchment from the plant of the Cooperativa Agraria Cafetalera Huadquiña Ltda. N° 109 arrive at the Central De Cooperativas Agrarias Cafetaleras Cocola Ltda. 281 with a humidity of 12% and go in sewn jute bags with an identification or label. The farmer's coding is maintained at all times to identify the provenance in each lot.

Documentation is generated with a series of data that is used to carry out the traceability of the product, as well as the physical and organoleptic analyzes (humidity, homogeneity, conditions of the bags in which the parchment was transported). The batch is then weighed, and a warehouse entry note is issued.

The parchment is stored in the space designated for the type of quality (if it is organic or conventional).

Once the batch has been piled up, a process report is issued and the batch is coded with the farmer's code, according to the Producer's Notebook.

The result of the process gives rise to the following types of coffee:

- i) Export coffee: Clean, homogeneous green beans.
- ii) Second-rate coffee: Defective beans (contains broken, black beans). iii) Discard coffee: With many defects.
- iv) Bola Coffee (coconut): It is a difficult coffee to pile and must be made by hand, the resulting bean has very strong and acidic organoleptic characteristics.
- v) Impurities
- vi) Shell.

After the separation, they are dispatched to Lima with a referral guide. The quality tests are carried out with all the beans that are sampled from each of the bags by the equipment that processes the coffee. To do this, the equipment separates a sample of approximately 10 to 30 g from each of the bags. The tests are carried out simultaneously and are divided into two types of analysis:

- a) Physical analysis: A 350 g sample of green beans is used and visually checked for beans of a color other than the optimal standard.
- b) Organoleptic analysis: For this test the same sample is used, in which a graduation scale that goes from zero to ten (0-10) is used and characters such as: Aroma, acidity, body, flavor are compared. It will be carried out by the tasting experts of the respective quality control laboratories. For this, 100g of green coffee is roasted moderately in a test roaster, they enter at 200° for a time of 6 minutes. Then it is cooled, about 10 g of roasted coffee is weighed for each 200 ml cup, each sample is ground for each cup for each sample, 5 cup repetitions are made and they are evaluated by trained personnel (between 3 to 5 people) to the analysis. Then, each one assigns a score and the respective averages are taken.

## 5. Method of production

In the entire CAFÉ MACHU PICCHU - HUADQUIÑA production area, coffee growers usually maintain a proportion of 80% of Typica variety plants, 10% of Catimor and the rest with the Caturra and Bourbon varieties. Since in almost all the cultivation plots it is customary to keep the plants of the different varieties mixed, from the cherry trees that are harvested and processed a parchment is obtained, and then a green coffee, which is the result of the mixture of all the varieties, predominantly Typica. This aspect differentiates CAFÉ MACHU PICCHU - HUADQUIÑA coffee from the coffees that are grown elsewhere.

It is customary to grow in the shade, the species that predominate as part of the shade or associated flora in the growing area of CAFÉ MACHU PICCHU - HUADQUIÑA, are constituted by Banana plantations, Avocado, Pacay, Granadilla and Papaya trees.

It is a dry crop, which means that its irrigation depends on the rain. The Huadquiña area corresponds to an irregular area, with very steep slopes, with coffee trees growing on slopes that can reach almost 45° in many places, the valleys are very narrow, and the altitudes are higher than in other areas.

The spacing that is customary to have between plants is slightly variable, prevailing between 2 m to 1.5 m.

### Seedbed:

Farmers obtain the seed from their own farms. Previously they carried out the selection of plants with good size, age, good production of cherry or parchment grain. Since 2002, the Cooperative has been producing coffee mother plants of the Typica variety and since 2004, seedlings of other different varieties such as Catimor and Bourbon have been produced, with an average production of 100 000 seedlings per year. The seed is provided from the previously selected farmer. This selection is in charge of the extension workers and to date 120 000 seedlings of the Typica, Catimor and Bourbon varieties have been produced in a proportion of 80%, 15% and 5%, respectively.

### Germinators:

Each germinator consists of 1,5 m<sup>2</sup> per kilogram of seed, it is a low-level bedding system, containing substrates of river sand. The seed in the substrate is watered inter daily up to 45 to 60 days (which is the germination period).

### Seedlings:

They are transferred to nurseries of beds that are fertilized with island guano and compost for a period of 30 days so that the organic matter decomposes and then makes the peeling (transfer of seedlings in the phosphorite and / or butterfly stage); or else, they are bagged in a medium consisting of soil and compost for a period of 5 to 6 months, to later be transferred to the field.

#### Step to Field:

Before the transfer of the seedlings, holes are opened at a distance of 2 x 1.5 m where they will be taken for the final transfer and agronomically handled like the rest of the plants, hoping that they will be able to produce at the third year. During the development of the plant in the field, weeding and fertilizing with island guano and phosphate rock is practiced every 3 months.

#### Flowering stage:

Fertilizing is practiced between 15 to 30 days before flowering, depending on the altitudinal floors. The flowering period begins, which lasts approximately 2 months, although the period of time varies according to the altitude of each of the production sectors. In this phase, weed control is practiced at ground level with tools designed and produced in the community.

#### Fruit filling or fruiting stage:

It begins in the months of September in sectors such as Santa Rosa, Quellomayo Bajo and Limonpata, at an altitude range of approximately 1,350 to 1,500 masl and lasts 5-6 months. In the highest areas (Sahuayaco, Lucmabamba, Yanatile, Chaupimayo), it begins in the months of October and lasts for a period of approximately 7 months. The maximum fruiting values occur in the months of January to February, with a formation of more than 80%. During this stage, activities such as weeding (llauchi), composting, shade thinning, biological control (*Beauveria bassiana*) are also carried out, which consists of the application of a biological control fungus to the coffee drill. During fruit ripening, it is not customary to use prohibited products to induce ripening or to control diseases. It is customary to carry out a pre and postharvest training course, where farmers are instructed on the care that must be taken when picking the cherry. The baskets where the cherry trees are collected are also prepared, cleaning them properly; Likewise, equipment is maintained (pulper, cherry and ferment wells).

#### Harvest and process to parchment grain:

It is practiced by the farmers themselves in an ancestral Ayllu system, that is, the harvest of the different sectors is carried out by the community members. They do this by using a polyethylene basket with a wire with which pull the branches from which they will take the ripe cherry. During the cherry picking, only the ripe grains are selected, which have cherry colour characteristics ranging from red to wine red. They are placed in jute-type cloth baskets. On the last day, the cherries are taken to the well where they are washed and selected from the plant remains and vain (defective) grains. Then, wet pulping is carried out, which consists of separating the grain from the shell in a manual grinder; This last by-product is taken to the ponds for the production of humus. The grains are taken to a fermentation well for a period of 14 to 18 hours. The ferment well is immediately filled with water to wash the grain in a period of approximately 2 hours, depending on the volume of grains. In this period of time, 3 washes are carried out, where the floating grains are eliminated and only the grains that remain at the bottom of the well are carefully selected. Next, the water is drained, and the grains are dried manually in bags or wheelbarrows and taken to the dryer. The dryers are spaces made of cement tiles, which, previously washed and cleaned, will be where the grains are spread for a period of time of 3 to 4 days, in which they will be aired using a wooden rake. At this stage it is also used to make a manual selection of some defective grains. Once the producer considers that the grains are dry, he uses his experience to do so, he proceeds to place the parchment coffee grains in jute bags to transfer them to the COOPERATIVA AGRARIA CAFETALERA HUADQUIÑA LTDA plant and from there to the CENTRAL DE COOPERATIVAS AGRARIAS CAFETALERAS COCLA LTDA., where samples will be taken from each of the bags of a batch

consisting of 8 to 10 bags. Each farmer manages a Producer's Notebook where he records all the activities he carries out on a daily basis.

Parchment process to export green coffee and traceability:

The bags containing the parchment from the plant of the COOPERATIVA AGRARIA CAFETALERA HUADQUIÑA LTDA. arrive at the CENTRAL DE COOPERATIVAS AGRARIAS CAFETALERAS COCLA LTDA. with a humidity of 12% and are in sewn jute bags with an identification or label in which the following information is recorded:

Cooperative data (name)

Certifier

Producer Code

It is attached with a Reference Guide, a Vehicle Cleaning Report and a List of Producers to whom the batch of coffee corresponds (this allows traceability). In CENTRAL DE COOPERATIVAS AGRARIAS CAFETALERAS COCLA LTDA. documentation, humidity, homogeneity, and conditions of the bags in which the parchment was transported, are verified. Then, the batch is passed, and an entry note is issued to the warehouse, the weight is expressed in quintals of 46k. The parchment is stored in the space designated for the type of quality (if it is organic or conventional), according to the certifier with which the Cooperative is monitored. Then, prior coordination with the Office of CENTRAL DE COOPERATIVAS AGRARIAS CAFETALERAS COCLA LTDA - Lima, regarding shipment requirements, it is threshed to turn it into green coffee.

Threshing consists of the following steps:

- a) Pre cleaning the parchment.
- b) Dispenser, this equipment separates the stones and waste from the grains
- c) Thresher, which separates the parchment shell from the gold grain and then from the green grain.
- d) Ventilation separation of parchment from grain.
- e) Classification of green grains. They go through a sorter that has sieves or nets. It is classified by gravimetry in 16 and 17 nets. The separation is carried out by weight gravimetry, for this, the coffee is weighed in export jute bags of 69k, at the moment, a sample of 30 grams is separated from each bag to be taken to the CENTRAL DE COOPERATIVAS AGRARIAS CAFETALERAS COCLA LTDA quality control laboratory for quality tests. Once the batch has been piled up, a process report is issued and the batch is coded with the farmer's code, according to the Producer's Notebook.

The process report includes the following data:

a) Owner's name b)

Type of coffee to be processed (parchment)

c) Number of bags or quintals

Then, the result of the process gives rise to the following types of coffee:

- i) Export coffee: Clean, homogeneous green grains
- ii) Second-rate coffee: Defective grains (contains broken, black grains)

iii) Discard coffee: With many defects

iv) Bola Coffee (coconut):

It is a difficult coffee to pile and must be made by hand, the resulting grain has very strong and acidic organoleptic characteristics. After the separation, they are dispatched to Lima with a referral guide that describes the following: - The characteristics of the product.

Batch number (through which you can check from which farmer that coffee grain comes from).  
- The quality - The type of certification - Number of bags and quintals. Information required by the tax authority is also recorded, such as: - Date - Departure point - Arrival point - Product - Weight - Carrier details - Driver data .

Organoleptic analysis: For this test the same sample is used, in which a graduation scale that goes from zero to ten (0-10) is used and characters such as: Aroma, acidity, body, flavour are compared. It will be carried out by the tasting experts of the respective quality control laboratories. For this, 100g of green coffee is roasted moderately in a test roaster, they enter at 200°C for a time of 6 minutes. Then it is cooled, about 10g of roasted coffee is weighed for each 200 ml cup, each sample is ground for each cup for each sample, 5 cup repetitions are made and they are evaluated by trained personnel (between 3 to 5 people) to the analysis. Then each one assigns a score, and the respective averages are taken.

If everything is in order, the shipment is sent.

## **6. Link with the geographical area**

The special characteristics of the product CAFÉ MACHU PICCHU - HUADQUIÑA is the result of the interaction of environmental factors: the climate, the soil, the water, the presence of fresh winds, the annual precipitation rates that supply the amount of water available for the various physiological functions during the phenology of the crop. The variations of maximum and minimum daytime and night-time temperatures throughout the year, the degrees of relative humidity that are not very high compared to other coffee growing areas, the number of hours of sunshine that coffee trees receive in a year.

As well as geographical factors: The growing area of CAFÉ MACHU PICCHU - HUADQUIÑA is geographically located near the valleys where the Historic Sanctuary of Machu Picchu is located and in the vicinity of snow peaks such as Salkantay, Sacsarayoc and Humantay. These snow peaks strongly influence the climate of the area, since they contribute to cooling the winds that run through the narrow valleys through which the Santa Teresa, Vilcanota, Lucumayo and Sacsara rivers pass. In this way, a microclimate is created where temperatures in the area favour a slow ripening of the cherry trees.

On the other hand, the less illumination due to the natural shade (provided by trees such as Pacay, Banana, Avocado, Papaya and Granadilla shrubs, among others) and the narrowness of the valleys, favour the mobilization of photosynthates from the leaves towards the cherry trees, helping said fruits and the seed to accumulate enough organic substance - such as the content of lipids, fibre, ash, carbohydrates and proteins - that contributes to this coffee having an excellent body.

The contribution of climate to the physiology of coffee trees is related as follows: The coffee tree is a C3 type plant and, apparently, it does not require high radiation for carbon assimilation. However, according to some studies, this crop would require sun to produce; although in soils with low fertility, excess humidity and moderate temperatures, a good availability of shade for the plants is favourable to obtain better characteristics of the fruit. In the case of the designated geographic area, shade is provided by trees such as pacay, banana, avocado, and passion fruit bushes, among others.

The associated flora creates appropriate conditions of humidity of the environment that together with the currents of fresh winds cooled by the 3 snow peaks that are near the production areas, determine that the temperatures to which the flowers are exposed during flowering and pollination, as well as cherries during the fruit setting phase, are appropriate for these physiological phases of the plant to occur at a low average speed, achieving a good accumulation of photosynthates that would be mobilized from the leaves to the tissues that are in development phase (those of the fruit). On the other hand, the irregularity of the mountains with very steep slopes where it is customary to plant coffee, mean that the availability of light is not excessively high, but rather moderate, which would contribute to achieve good quality fruits in the coffee body. All this set of factors creates an appropriate microclimate so that the metabolites synthesized and stored by plants produce aromatic components, oils and carbohydrates that are formed during the roasting of green grains, during grinding and when it is mixed with water during preparation, resulting in an excellent body and flavour.

Other areas such as La Merced, Villa Rica, etc. produce good quality coffee, but the differences with CAFÉ MACHU PICCHU HUADQUIÑA could lie in the less irregular geography of those areas, where there are spaces or cultivation areas with coffee plantations exposed to less shade than that observed in the designated geographical area. In addition, there is the factor of the altitudinal variation, which is different in both regions. Regarding the soil component, the pH in the soils of Huadquiña varies according to the different localities where it has been sampled in a range of 5.56 to 7.83. This indicates a pH trending from moderately acidic to slightly alkaline. In the Maranura zone, in Quillabamba, the soil samples showed pH values between 5.12 and 7.29, from strongly acidic to slightly alkaline, showing a trend quite similar to that of Huadquiña. However, when contrasted with the soils of La Merced, it is noted that the samples from this locality exhibit soils with more acid pHs (4.2 to 4.4.), classifying them as strongly acid soils.

Therefore, there is a clear differentiation between the area where the appellation of origin CAFÉ MACHU PICCHU HUADQUIÑA is located and other spaces. In line with the above, in physiological terms it is known that soils with slightly acidic to neutral pHs allow a better availability of nutrients to plants, which improves the metabolic capacity of plants and their ability to synthesize many more metabolites, which are then mobilized and stored in structures such as seeds, fruits, etc. For this reason, the soils where the coffee trees are grown present differences in the degree of acidity in relation to other spaces, which impacts on the determination of the quality of CAFÉ MACHU PICCHU HUADQUIÑA.

The producers of the CAFÉ MACHU PICCHU HUADQUIÑA have a series of skills they carry out at different stages of production, which includes the seedbed of carefully selected seeds of mother plants to germinators where they remain between 5 to 6 months. The plants

are taken to the field and fertilized with organic fertilizers such as compost, island guano, so that they begin to produce after 3 years at a distance of 2 x 1.5 meters.

In all the places of Huadquiña, the producers tend to maintain a proportion of 80% of plants of the Typica variety, 10% of Catimor and the rest with the Caturra and Bourbon varieties. However, in almost all cultivation plots it is customary to keep the plants of the different varieties mixed, so that the cherries that are harvested and processed will result in a parchment and then a green coffee that is a mixture of all the varieties, where the one that predominates is the Typica. This condition is an aspect that differentiates CAFÉ MACHU PICCHU HUADQUIÑA from those grown in other places. In the areas of Huadquiña and the upper part of La Merced, it is cultivated in the shade, although in the lower part of La Merced there are many plots with crops with little shade or none.

The species that predominate as part of the shade or associated flora are made up of banana trees, avocado trees, pacay, granadilla and papaya. The plantations in the area of study ranged in age from 5 to 30 years, while in La Merced the plantations are younger. During the development of the fruits, the producers practice biological control of Broca with Beauveria Bastiana. It is customary to carry out a pre and post-harvest training course, where farmers are instructed on the care that must be taken when picking the cherry. The baskets where the cherries are collected are also prepared, cleaning them properly; Likewise, equipment is maintained (pulper, cherry and ferment wells).

Regarding soil fertilization, in the production area most farmers do not use any product or in some cases add humus or compost. For the harvest, producers take care of the preparation of equipment and infrastructure such as pulpers, fermentation wells and tools such as baskets, etc. The cherries are harvested in an Ayllu system and with care that only ripe cherries are collected.

At all times, farmers record all activities related to cultivation, which includes harvesting and marketing, in a "Producer's Notebook". In addition, producers carry out wet pulping and wash and sort defective grains. The water undergoes filtration in wells so to avoid contamination of the water sources. The pulp remains are used for the preparation of compost. The fermentation process takes between 14 to 18 hours, the grains are washed for 2 hours, the parchment grain is transferred to the dryers in pottery for a period of 3 to 4 days. They are then moved to the C.A.C. Huadquiña warehouse with the farmer's code and from there they are taken to the Quillabamba plant of CENTRAL DE COOPERATIVAS AGRARIAS CAFETALERAS COCLA LTDA in jute bags.

## **7. Inspection body**

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## 8. Labelling

Peruvian Metrological Standard NMP 001: 2019 "Requirements for the labelling of pre-packages" - 5th edition, as applicable.

PDO PGI Product specification template PN09 v1 December 2020