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Costs of Growing Coffee (*Coffea arábiga l.*) Production, Profits and Unit Cost in the Municipality of Amatepec, State of México. 2023

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ABSTRACT

The vast majority of coffee producers in the different states of the Mexican Republic, when asked how much it costs to produce cherry, parchment or roasted coffee per unit area, do not know and do not keep records of their costs. This leaves them unable to budget effectively and allocate resources during the year, putting them in a vulnerable situation in the face of changing markets and the supply and demand of national and international coffee. With the objective of presenting an overview of coffee costs, profit and unit costs, in the Municipality of Amatepec, a comparative field study was carried out with the producing states of Veracruz, Puebla, and Chiapas, during 2023. To obtain the costs A survey was applied to representative producers of the region chosen in a completely random sampling, then the FIRA methodology was used to determine total production costs in coffee cultivation. The results indicate that for the production season the activity of cultural work 25%, harvest with 24%, then fertilization with 21% and pest control contributes with 14%. As a result of prices and costs, the profits obtained in coffee cultivation are safer in parchment and roasting both for the Municipality of Amatepec, and in the states of Veracruz, Puebla and Chiapas with which the comparisons were made.

Keyword: Cost, parchment coffee, profitability, competitive, profit.

INTRODUCTION

Coffee is one of the most important agricultural products traded internationally, being the main producers of Arabica and Robusta beans: Brazil, Vietnam, Indonesia, Colombia and Ethiopia. Mexico also participates in 9th place, as well as other Latin American countries such as

Nicaragua, Honduras, Costa Rica and El Salvador. Establishing the variables that most influence coffee production will allow us to determine its profitability and profit for the producer. The sustainability of the coffee industry begins by understanding the costs of production, profits and unit costs and the variables that affect them. Until we know this, sustainability is impossible.

The vast majority of producers do not know how much it costs to produce a kilo or sack of parchment/gold coffee. This makes them unable to budget effectively and allocate resources during the year, putting them in a vulnerable situation (Cortez, 2023.PECA).

Sadeghian, S., (2008), states that coffee producers are currently facing an increasingly competitive world market, it is a priority to review the factors that affect the profitability of the crop, among which is included the cost of fertilizers, whose continuous increases have generated concern in Latin America and Mexico, since the participation of fertilization in total production costs has increased from 10% to 20% in the last two years. The question then is to determine what other costs are influencing the productivity of this crop. And in the case of organic fertilizers, the quantities or doses to be applied are closely related and influence the total cost of the crop and therefore its profitability.

For Latin America, PECA made assumptions about the characteristics of coffee costs: it was assumed that the size of the farm would be three hectares with between 4,500 plants per hectare (Ecuador) and 5,500 plants per hectare (Colombia), which is because three hectares is what a family needs to survive; with one hectare of land, a family cannot survive.

In this sense, Caravela Coffe, 2023 presents an overview of the costs of coffee production in three countries, having the following scenario (with an assumption of 3 ha in USD): Colombia 15,744, Ecuador 19,9143, Nicaragua, 12,981, Peru, 14,837, Guatemala 17,400, and El Salvador, 15,503, which includes Administration, Harvest (Man B), Supplies, Infrastructure and Renovation. 15,503, which includes Administration, Harvest (Man B), Supplies, Infrastructure and Renovation.

According to López and Caamal (2007), the total cost of maintaining a hectare of conventional coffee is an average of $9,443.40 pesos, of which almost 72.6% corresponds to labor costs, while the rest is due to the use of fertilizers.The average yield per hectare was 10 quintals per hectare, so the average income was $9,200 pesos per hectare, in other words, the income was less than the costs.

With the above data on coffee production and mainly on costs, it is proposed in this article to study in a comparative way and present them for the Municipality of Amatepec, State of Mexico, in its production phase, to obtain the profits and unit costs in particular of its coffee producing region, which is located around the city of Amatepec in more than three localities.

JUSTIFICATION

Coffee is considered to be one of the most important raw materials monitored in the world economy. Thus, for many of the world's least developed countries, coffee exports represent a fundamental part of their foreign exchange income, in some cases more than 80% (Asociación

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Bancaria de Guatemala, 2012). Coffee production has a high economic and social value, and the activity also plays an important environmental role, since its production takes place under systems that maintain an almost permanent vegetation cover on the soil, thus reducing erosion problems. The combination of economic, social and environmental benefits generated by coffee cultivation makes it necessary for the agents involved in the sector to promote the necessary incentives to support the competitiveness and economic growth of the bean. The application of better fertilization and climate control technologies will be an essential part in increasing the productivity of this crop in developing countries, thus balancing the world economy.

And as an example of costs, according to López and Caamal (2007), in Chiapas the total costs to maintain a hectare of conventional coffee are located on average at $9,443.40 pesos, of this value, almost 72.6% corresponded to the expenses in payment of labor, while the rest was for the use of fertilizers, the average yield per hectare was 10 quintals per hectare, so that the average income was located at $9,200 pesos per hectare, in other words, the income was less than the costs.

The purpose of this document is to present an overview of the production costs of coffee cultivation, its profit and unit costs in a high-altitude region, in a producing zone for the State of Mexico, Amatepec, and to compare these costs with other important producing regions of the Mexican Republic such as the states of Chiapas, Puebla and Veracruz, given that although it is not among the main producing states, for the region it represents an additional boost to the regional economy.

We must consider that the state of Mexico does not appear among the coffee producing states, even with this situation, it is reported through its Secretary of Agricultural Development an annual production of 650 tons and an estimated production potential per hectare applying technology that would reach 2.5 ton/ha. (Sedagro, 2019).

HISTORY OF COFFEE IN THE MUNICIPALITY OF AMATEPEC, STATE OF MEXICO

Amatepec maintains an economic revenue of more than 16 million pesos annually thanks to its large coffee production. The plant arrived in the municipality simply as an ornamental plant more than 100 years ago, its native origin prevails thanks to the climate that favored its production with the dedication of dozens of farmers who extended their plantations with the intention of self-consumption.

Currently there are 400 hectares with nurseries and plantations that produce a measure of 600 to 700 kilograms per hectare, generating 300 tons of coffee beans per year, the market cost per kilo is 70 pesos.

Seventy percent of the bean production is of the Criollo type, which gives a quality consistency and flavor, the remaining 30 percent is of varieties such as improved coffee, caturra, Oro Azteca, Pacamara, among others, some of which are resistant to rust, a plague that kills the plantation.

Joel Morales Hernandez, one of the producers with more trajectory in the municipality, explained that due to the high production, several organizations have been created that are looking for ways to sell their product depending on the volume of their harvest. "There are three

organizations that process the product, they have even patented it for its commercialization outside the country". He pointed out that the organization CAFOA (Café Orgánico de Amatepec) has exported the product in an informal way to the American Union, neighbors of the community of 50 Arrobas take it to a Mexican store in Chicago where they sell only products from here, from the south, and there it is exhibited for its commercialization.

He indicated that the coffee growers of Amatepec have supplied orders to any part of the country, we are preparing an order for the hotel zone of Cancun, said Morales Hernandez proudly.

The largest production is in the communities of San Miguel and Coahuilotes, which are located at an average altitude of 1,400 meters above sea level, a good part of production is also found in La Goleta and Tlachichilpa, at an altitude of 2,200 meters above sea level, and the total production is in the municipal seat at 1,800 meters above sea level. The rugged geography of these areas does not allow the cultivation of corn and beans, so the farmers opted to produce the coffee plant that adapted successfully in these mountains, discovering that the altitude determines the quality of the coffee.

Harvesting is done once a year, harvesting is carried out when the grain is a cherry and is done manually, at least three day laborers are required per hectare, which generates 60 percent of total expenses during the year for producers, however, they have discovered that producing coffee is more profitable than planting seeds (Estrada, 2017).

MATERIALS AND METHODS

Location

The municipality of Amatepec is located 139 kilometers from the capital of the State of Mexico, and is located between parallels 18º40'58" north latitude and between meridians 100º11'11" west longitude of the Greenwich meridian, southwest of Mexico City and Toluca. The extreme coordinates are: maximum 18º48'26" north latitude, 100º30'19" west longitude; minimum 18º35'26" north latitude, 100º00'17" west longitude: it is part of the judicial and revenue district of Sultepec, of the socioeconomic region number IV with headquarters in Tejupilco de Hidalgo, State of Mexico (Figure 1) (Figure 1).

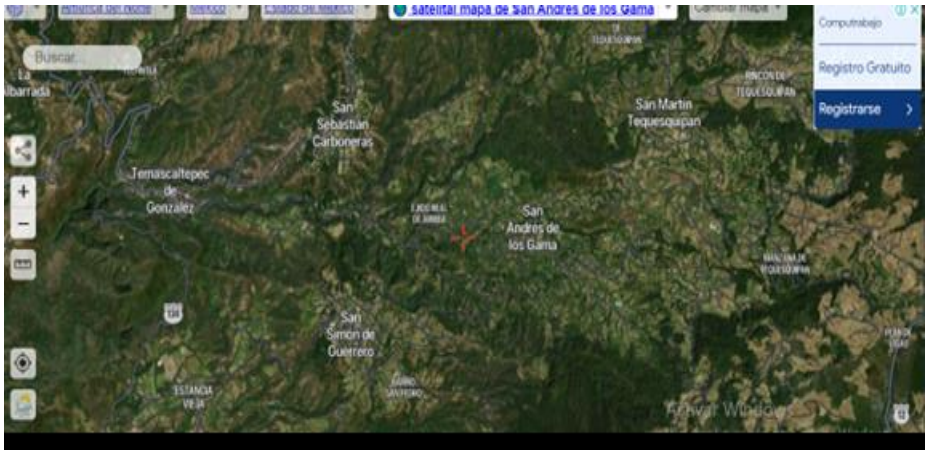


Figure 1: Location of the Municipality of Amatepec, State of Mexico.

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Extension
It has 638.55 square kilometers corresponding to it, according to data registered by the Subdirection of Studies and Consultation of the State Territory, of the Secretary of Finance and Planning of the Government of the State of Mexico.

Orography
It represents great abysses, deep ravines and depressions that determine the mountainous system of Amatepec.

Hydrography: The ruggedness of the municipality means that it has runoffs that when added to each other form streams and rivers; the San Felipe River is the most important because it maintains its flow all year round, this river serves as a boundary between the municipalities of Tejupilco and Amatepec, it flows into the Cutzamala River, which in turn empties its waters into the Balsas River.

Weather
According to the topographic situation of the municipality, two types of climates predominate, temperate and subtropical, the latter is located in the municipal delegations located in the western, northern and southern part of the municipality, while the temperate climate is found in the east in La Goleta, Tlichichilpan and other delegations located in the mountains, as well as in the municipal capital.

In summer the rains appear, plants and trees are renewed and the agricultural period begins. In autumn the farmer harvests corn, beans, pumpkin, sugar cane and sesame; flowers also appear in the fields, guava, orange and lime are harvested, among other fruits.

In the winter the trees lose their foliage, some flowers wither, some citrus products are obtained in the region; jicamas, custard apples and peanuts. The temperature varies from 15º to 40°C.

Flora
The vegetation is varied, there are pine trees, oaks of different species, oaks, sabinos, cedars that belong to the family of conifers, the climate of the region allows the existence of a great variety of vegetables, which are produced in vegetables such as: tomato, onion, cabbage, cucumber, lettuce, green chili, radish, green beans, chayote and chilacayote; among the fruit plants can be mentioned: mamey, avocado, custard apple, loquat, pineapple, guava, nanche, orange, lime, mango, banana, tamarind, myrtle, blackberry, sapote, lemon and grapefruit; among medicinal plants: black, bush, and lemon tea, wormwood, linden, basil, coachalata, colorín, cirian, epazote, chamomile, eucalyptus, marjoram, mallow, muitle, fennel, tárete, iztafiate, jarilla, yerba de golpe, sávila, altamisa, horsetail and meshishe.

Fauna
There is a great variety of animals of different kinds that have been useful or harmful to humans: the badger, coyotes, foxes, armadillos, tlacuaches, cacomiztles and lions.

Vertebrate mammals: horse, dog, mules, cow, goat, deer, wild boar, cat, badger, salamander,

skunks, rat, ferret, rabbit, hare, squirrel, armadillo, gopher, margay, margay, field rat, guinea pig and opossum.

Birds: eagle, lammergeier, vulture, vulture, aura, owl, tecolote, crow, magpie, chachalaca, quail, güilota, white dove, pinyon, thrush, mockingbird, spring, woodpecker, stilt, calandra larks, chuparrosa, goldfinches, sparrows, mulatto bird and roadrunners.

Reptiles: snakes such as the mazacuate, rattlesnake and coral snake, iguanas of various colors and sizes, turtles, alligators, scorpions, frogs, toads, frog snakes, lizards, chameleons.

Insects: red and black ants, bees, red and brown wasps, butterflies, leafhoppers, aphids, mealybugs and damselflies.

Arachnids: black and black scorpion, ticks, various spiders and crabs.

Natural Resources:
It has a total area of 69,497 hectares distributed in: Forest area: 19,979 hectares, Chaparral matorral and low jungle: 2,536 hectares.

Population
The municipality of Amatepec registered a total of 26,334 inhabitants in the 2010 Population and Housing Census conducted by the National Institute of Statistics and Geography, of which 12,799 are men and 13,535 are women.

Locations
In the municipality of Amatepec there are a total of 178 localities, being the main ones and their population in 2010 the following:

Location	Population
Total Municipality	26,234
Palmar Chico	3127
The Zapote City	117
Amatepec	2157
San Simon	997
Palamarillos Saltpeter	665
Cerro Del Campo	565

Source: Own elaboration of municipal monograph data. 2023

Method
This research is descriptive. The analysis of secondary sources was carried out from the analysis of the costs according to the methodology used by the Institution FIRA (Fideicomisos Instituidos en Relación con la Agricultura) of Mexico, which calculates the costs in two ways a first one of establishment and a second one of Production that is the one that will be used in this study. The compilation of sources was carried out from the application of a questionnaire to coffee producers with conventional and organic production systems, with the objective of identifying the production costs of conventional and organic coffee by stages where the costs

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generated from the harvest to the moment of commercialization of the coffee, and the costs that this entail, were asked. Once the information was obtained, percentages of the costs were determined and from there specific cost indicators were obtained. The survey collection center was the offices of CAFOA (Café Orgánico de Amatepec at km 22.5 of the Tejupilco Amatepec highway). Profit was estimated by the value of kilograms per kilogram per price minus production costs. For unit costs, the quotient of production value by units produced (kg) will be applied,

Variables

The variables to be used in this cost study will be the following:
The independent variables are the causes of the changes that occur in the dependent variable.

Independent Variable (s) (x) = seed, plant, fertilizer, cultural work,}
Taxes, pesticides, irrigation, shading, etc.

The dependent variables are the effects of the events considered as independent variables.

Dependent Variable(s) (y) = Coffee Yield, Cost of Production, unit cost.

This is evaluated with the sampling instrument, in this case a questionnaire.

Instrument

The simplest form of using an instrument as a resource that the researcher uses to approach the problem and extract information from what is intended to be studied.

The survey in this study is the instrument that allows us to obtain the values of the variables defined as costs, yield and their causes, fertilizer cost, labor, cultural labors, pesticides, irrigation labor, etc. This instrument was applied to representative producers in the CAFOA (Café Orgánico de Amatepec) offices and coffee processing center.

RESULTS

Table 1 shows the costs according to the FIRA Format for the production phase of coffee cultivation for the producing states of Veracruz, Puebla and Chiapas Mexico as reported by FIRA, Bank of Mexico (2022).

For Amatepec, the highest contribution corresponds to cultural work with $8,000.00, followed by harvesting activities with $7,500.00, then fertilization with $6,500.00 and pest and disease control with $4,500.00. The overview of costs in the comparison states reveals that Chiapas has the highest total value of costs, followed by Veracruz and finally Puebla.

And the contributions are similar in fertilization concepts, where Veracruz contributes $ 15,550.00 to fertilization, Chiapas reaches in the same item $ 17,080.00 and Puebla presented the lowest values of production costs.

Table 1: Comparison of coffee production costs in Amatepec, State of Mexico 2023

CONCEPT	Veracruz $	Puebla $	Chiapa $	Amatepec $
FIELD PREPARATION	0.00	0.00	0.00	0.00
SEEDING	0.00	0.00	1,488.00	0.00
FERTILIZATION	15,550.00	4,276.00	17,080.00	6,500.00
CULTURAL ACTIVITIES	5,400.00	1,850.00	3,060.00	8,000.00
IRRIGATION	0.00	0.00	0.00	3,280.00
PEST AND DISEASE CONTROL	3,280.00	1,963.00	3,733.00	4,500.00
HARVESTING, SORTING AND PACKING	16,600.00	11,676.00	16,700.00	7,500.00
MARKETING	0.00	0.00	2,170.00	0.00
MISCELLANEOUS	567.00	1.105.00	870.00	2,300.00
TAXES	3522.00	1,519.00	3,848.00	2,800.00
TOTAL	**44,919.00**	**22,389.00**	**48,949.00**	**31,600.00**

Source: Own elaboration, 2023. Cost in Mexcan Pesos.

Figure 1 shows the production costs expressed as a percentage, where it can be seen that cultural tasks account for 25%, harvesting and packing 24% and fertilization contributes 21%.

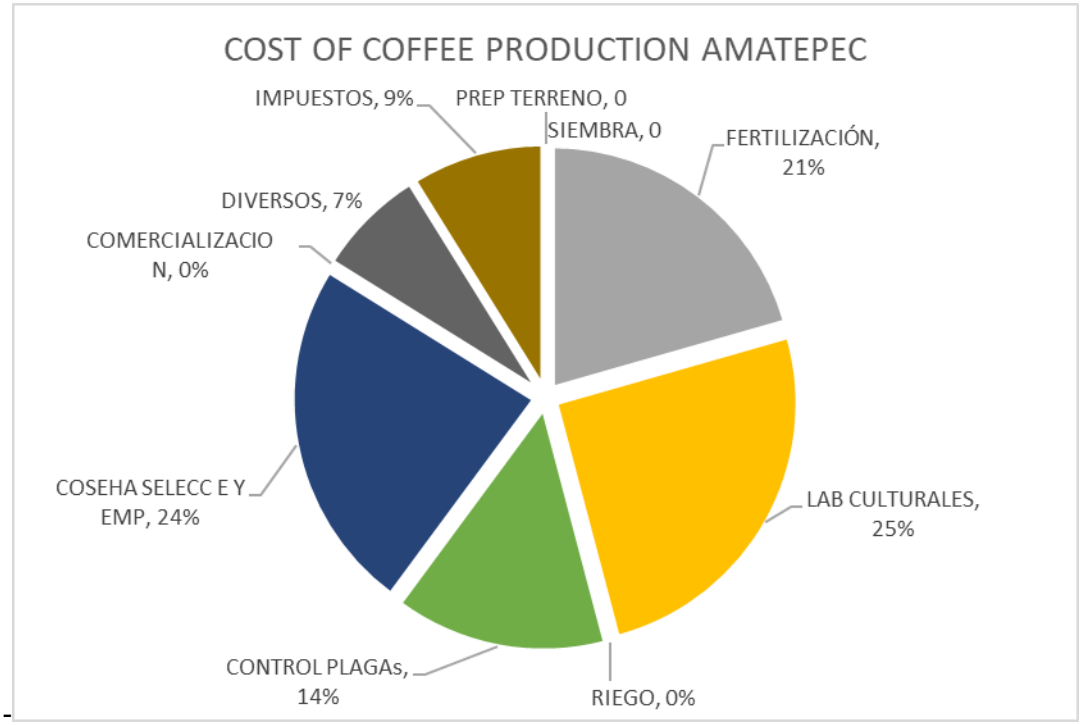


Figure 1: Percentage of production costs in Amatepec State of México 2023

In the following table number 2, the corresponding value of the municipality of Amatepec is presented for green cherry, parchment and roasted beans with the value they reach in the local market of Amatepec, and its value in pesos for each of the phases of coffee product. It is shown that the value increases from green cherry ($15,600.00) with a yield of 1200 kg/ha. Then with lower kilograms of yield (600 kg /ha) it reaches a value of $ 72,000.00 and already in roasted beans in fewer kilos due to the production process there are 580 kg. for a value of $ 185,600.00.

The behavior of the prices in the three comparison states is higher for green cherry in Veracruz $ 24,180.00; for parchment it reaches a value of $111,600.0 and for roasted coffee the value of the production reported in this state would reach $192,000.00. For Amatepec, in roasted coffee, the values are higher than those of Puebla and Chiapas and lower than those of Veracruz.

Table 2: Value in pesos of coffee, cherry, parchment and roasted yields. Municipality of Amatepec, State of México 2023.

	Veracruz		**Puebla**		**Chiapas**		**Amat.**	
Yield. Cherry	kg	$13.0	Kg					
	1,860	**$24,180.0**	1490.0	**$19,370.0**	1760.0	**$22,880.0**	1200	**$15,600.0**
Parchment		$120.0						
	930.0	**$111.600.0**	741.0	**$88,920.0**	730.0	**$87,600.0**	600	**$72,000.0**
Toasted		$320.0						
	600.0	**$192,000.0**	450.0	**$144,000**.0	439	**$140,480**.0	580	**$185,600.0**

Source: own elaboration.2023

Finally, in Table 3, derived from the yields, income and cost values, we have the profit in the three phases of coffee processing. In the case of Amatepec the profit is $ 113,400.0 in roasted coffee, parchment $7,400.00 and in green cherry there is no profit remaining at -$8,800.00. In comparison with the three producing states, Amatepec obtains better profits due to its lower production costs, followed by Veracruz. Then Puebla and then Chiapas.

Table 3: Profits in coffee cultivation, in Cereza Verde, Pergamino and Tostado. Amatepec, Edo de México. 2023.

		Veracruz			**Puebla**	
	C	P	T	C	P	T
Production kg	1860	930	600	1490	741	450
Price	$19.0	$ 65.0	$250	$19.0	$ 65.0	$250
Income	$35,340.0	$60,450.0	$150,000.0	$28,310.0	$48,165.0	$$112,500.0
Cost	$44,919.0	$44,919.0	$44,919.0	$22,389.0	$22,389.0	$22,389.0
Profit	-$ 9,579.0	**$15,531.0**	**$105,081.0**	**$5,921.0**	**$25,776.0**	**$90,111.0**
0		**Chiapas**			**Amatepec**	
	C	P	T	C	P	T
-Production kg	1760	730	439	1200	600	540
Price	$19.0	$65.0	$250.0	$19.0	$65.0	$250.0
Income	$33,440.0	$47,50.0	$109,750.0	$22,800.0	$39,000.0	$135,000.0
Cost	$48,949.0	$48,949.0	$48,949.0	$31,600.0	$31,600.0	$31,600.0
Profit	-$15,509.0	-$1,499.0	**$60,801.0**	-$8,800.0	**$7,400.0**	**$103,400.0**

Keys: C = Cherry Coffee, P = Parchment Coffee, T = Roasted Coffee, T = Roasted Coffee.
Source: Own elaboration 2023

The data used to calculate the prices of the three phases of coffee, cherry, parchment and roasted, are changing from the kilograms of each stage from green to roasted, reducing the number of kilograms, but increasing the price as explained by the producers and coffee processing companies in the region. For this study representative prices were taken from commercial and official organizations, such as SIAP, and commercial departments for the

purchase and sale of coffee. Thus, we have that Chiapas reported for 2020 the price of parchment from $38.00 to $45.00. (Lomelí. 2023) And in the case of ground coffee depends on the quality of the product where in the market they are offered up to $500.00 to $800.00 pesos.

On the other hand, according to the U.S. Department of Agriculture, in the December 2020 estimate, green coffee production in Mexico is expected to be 234,000 tons in the 2020/21 coffee cycle, which gives us a perspective of the values it can reach in the market.

Finally, in Table 4, we present the calculations for the unit cost in the municipality of Amatepec and in the three coffee producing states selected for their greater production and area planted.

Table 4: Cost of coffee in production, profit and unit cost for Temascaltepec and four producing states of the Mexican Republic.

Concept	Veracruz	Puebla	Chiapas	Amatepec (EMex)
Coffee establishment cost $	**44,919.00**	**22,389.00**	**48,948.00**	**31.600.00**
Cherry coffee yield kg/ha	1,860.00	1,490.0	1,760.0	1,200.00
Parchment coffee yield kg/ha	930.0	741.00	730.00	600.00
Roasted coffee yield kg/ha	600.00	450.00	439.00	540.00
Cherry coffee unit cost $	**24.20**	**15.00**	**27.80**	**26.3**
Cherry coffee commercial price $	19.00	19.00	19.00	9.00
Diferencia	5.20	- 4.00	8.80	7.30
Parchment coffee unit cost $/kg	**48.3**	**30.2**	**67.1**	**52.7**
Commercial Price Parchment $/kg	117.0	117.0	117.0	117.0
Diferencia	-68.7	-86.8	-49.9	-64.3
Roasted coffee unit cost $/kg	**74,9**	**49.8**	**111.5**	**58.5**
Commercial price of roasted coffee $/kg	290.00	290.0	290.00	290.00
Diferencia	-215.1	-240.2	-178.5	-231.5

Source; Own elaboration. 2023. Note: commercial prices were taken from comercial centers

What we can highlight in each phase of the coffee bean in Table 4 is, firstly, that the unit costs for cherry were higher than the commercial prices of the region, with the unit cost in Chiapas at $27.8/kg, then Veracruz at $24.2/kg, then Amatepec at $26.3/k g, and in fourth place Puebla at $15.0/kg.

For the parchment grain stage, the calculated unit values show Chiapas in first place with 67.1 $/kg, Amatepec in second place with 52.7 $/kg, Veracruz in third place with 48.3 $/kg and Puebla in fourth place with 30.2 /$/kg. The commercial unit values for this type of grain are higher than all the calculated values with an average of 117 $/kg with a difference in favor of the commercial prices of parchment grain.

The value in order from highest to lowest in roasted coffee is as follows: Chiapas with 111.5 $/kg, second place Veracruz with 74.9 $/kg, Amatepec with 58.5 $ /kg and in fourth place Puebla with 49.8 $/kg, The commercial values of roasted coffee exceed the calculated values and has an average of 290.0 $ /kg and refer to commercial products from already recognized commercial stores such as Liverpool, Walmart Nescafe etc.

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With this unit value of coffee, we can proceed to calculate the regional commercial sales prices, as an example:01

Selling price = [(cost of item) ÷ (100 - percentage of brand name)] x 100a

In each case, coffee prices at each stage could be applied in a simple manner, which due to the complexity of price theory is not discussed here.

As an example, if we use the unit cost of roasted coffee as the basis of this formula, we would have a 35% profit margin.

Selling price cherry coffee= [(24.2)/ (100-20)'x100--= [24.2 / 80] x10 0] = 30.25 $

According to Rubio (2021), unit cost is the monetary value of producing a good or service. It is usually calculated as the cost of producing all goods divided by the number of goods produced. It is essential in business to know the unit cost of what it costs to produce a good, because this will have a direct impact on the price of the final product and, probably, on the customer's decision to purchase it.

Comparisons with the other producing region of Estadio de México and distant from Temascaltepec by more than 100 kms, Amatepec, indicate the following:

	Amatepec	Temascaltepec.
Production costs	$ 31,600.0	$ 36,300.0
Percentage of fertilizer activity	21 %	26 %
Harvest	24 %	33%
Lab, cultural	25 %	19 %
Yield cherry coffee	$ 15,600.0	$ 22,100.0
Yield coffee Pergamino	$ 72,000.0	$ 72,000.0
Roasted coffee yield	$ 185,000.0	$ 185,000.0
Yield in kg cherry coffee	$1,200.0	$ 1,700.0
Coffee yield Parchment	600.0	600.0
Roasted coffee yield	580.0	580.0
Unit cost of cherry coffee	$ 26.3	$ 21.4
Unit cost of parchment coffee	$ 52.7	$ 60.5
Unit cost Roasted coffee	$ 58.5	$ 62.6

CONCLUSIONS

1. The production costs in pesos ($) for coffee cultivation are as follows, in order of highest to lowest importance: Chiapas, Veracruz, Amatepec and Puebla.
2. The factors of production: that influence the cultivation of coffee for the municipality of Amatepec are the following: Cultural labors (25%), Harvesting and collection (24%) Fertilization (21%) and pest and disease control (14%).
3. The production value in pesos ($) for each type of coffee bean indicates: Cherry coffee Veracruz, Chiapas, Amatepec and Puebla.
   In Pergamino coffee: Veracruz, Puebla, Chiapas and Amatepec.

In Roasted coffee: Veracruz, Amatepec, Puebla, and Chiapas.}}

4. In the aspect of processing, subtracting production costs, we have:
   Cherry coffee, Chiapas, Amatepec, Veracruz, and Puebla.
   Parchment coffee: Chiapas, Amatepec, Veracruz, and Puebla.
   Roasted Coffee: Chiapas, Veracruz, Amatepec and Puebla.
5. Finally, the unit cost ($/kg) for the three types of coffee indicates the following:
   Cherry Coffee: Chiapas, Amatepec, Veracruz, and Puebla.
   Pergamino Coffee: Chiapas, Amatepec, Veracruz and Puebla.
   Roasted Coffee: Chiapas, Veracruz, Amatepec and Puebla.
6. Despite not appearing among the coffee producing states with these results, Amatepec coffee demonstrates its potential in production value, processing and unit costs, demonstrating its competitiveness with the states compared.

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