

Market of bananas in the city of Lavras-Minas Gerais (Brazil) from 2002 to 2017

José Clélio de Andrade¹, Lair Victor Pereira², Ângelo Albérico Alvarenga³, Ester Alice Ferreira⁴, Marcelo Ribeiro Malta⁵, Paulo Márcio Norberto⁶, Joyce Ludimila da Cruz⁷

¹⁻⁶Searchers from the Agricultural Research Company of Minas Gerais - EPAMIG, CP 176 Lavras-MG, Brazil, 37200.000

⁷Scholarship PIBIC FAPEMIG/EPAMIG, Lavras-MG, Brazil.

Abstract— *The banana market has grown considerably in recent years due to the increase in the supply of this fruit, both in quantity, quality and punctuality of the daily / weekly offer in the gondolas of hortifrúti retail establishments. Also, trade has grown due to increased consumer demand for this product, because of the change in people's behavior for better quality foods, such as bananas. This work was carried out in the city of Lavras, Minas Gerais, Brazil, from 2002 to 2017, making monthly collections in hortifrúti retail establishments, using spreadsheets to record the quantities sold, gondola losses with information from the sector managers and per capita consumption made through the ratio of the quantity sold and the number of inhabitants of the city at each stage of the research, in order to know the size of the banana market in this city.*

Keywords— *Banana, Per capita consumption, Marketplace, Losses.*

I. INTRODUCTION

Fruticulture, in general and banana farming in particular, is one of the most prominent sectors in Brazilian agribusiness. Through a wide variety of fruits produced throughout the country and in different climates, fruit production achieves significant results and generates business opportunities. Brazilian production was approximately 44.0 million tons in 2017. This production places Brazil as the third largest producer of fruit, behind only China and India [1].

Brazilian production is focused on tropical, subtropical and temperate fruits, thanks to its territorial extension and geographic position. According to the Brazilian Fruit Institute (IBRAF), fruit growing in Brazil occupied an area of 2.6 million hectares, moved 5.2 billion dollars and employed 6 million people [2].

Banana is one of the most cultivated and consumed fruits in nature in Brazil and the world, being the second in the world, behind only the orange. It occupies the first place in the Brazilian ranking of fruits, with more than 106 million tons. In the world, there are more than 125 countries that are dedicated to the cultivation of bananas. In some of them, activity stands out as one of the main sources of employment and income generation [3] ; [4].

Advances in research and development in the exploitation of banana farming in recent decades have enabled the fruit market to grow in quantity, quality and its supply throughout the year.. In this sense, banana farming has expanded considerably in most countries in the last three decades, from 35 million tons in 1978 to 107 million tons in 2011 [4].

In Brazil, climatic conditions allow the banana to be grown in all states, throughout the year, meeting the demand of domestic consumption. Brazilian banana production was 6.76 million tons, with the main producers São Paulo being 1,089 thousand (1,089 million tons), Bahia with 1,084 thousand (1,084 million tons), Minas Gerais with 773 thousand tons and Pará with 504 thousand tons and the other states with 2,590 thousand tons (2,590 million tons) [2].

The main types of banana produced and consumed in the country are: Silver, Nanica and Maçã, which, according to Andrade et al., 2017, in the south of Minas Gerais correspond to 80%, 15% and 5% of production, respectively [5].

The consumption of banana comes from a characteristic that makes it one of the fruits that comes by nature packed, practical, delicious and easy to be consumed in any place and time. It is a fruit rich in fiber, vitamins and minerals, notably potassium. On the other hand, ease of access also contributes to high consumption rates, since it is found everywhere. The predilection can be seen in the numbers, since about 99% of the national production supplies the domestic market. [6] ; [7].

Consumption of fruits, especially bananas in particular, has grown significantly due to people's interest in healthier foods [1]. This trend for better food quality was confirmed in a study conducted by the Center for Advanced Studies in Applied Economics of the University of São Paulo (Cepea-USP), where it increased by approximately 4.38 kg per person year in the period from 2005 to 2011 [8]. This change in people's behavior regarding dietary habits has been responsible for the increase in banana trade [9].

The objective of this work was to know the banana trade of the city of Lavras - MG, in relation to the volume sold, percentage of losses in the gondolas and per capita consumption of bananas by the population from 2002 to 2017.

II. METHODOLOGY

This research was carried out in six stages in the city of Lavras - MG, Brazil, the first one in 2002/2003; the second of 2004/2005, the third of 2008/2009, the fourth of 2011/2012, the fifth of 2014/2015 and the sixth of 2016/2017 in the months of July to June, in the various networks of supermarkets, wagons and fairs - free.

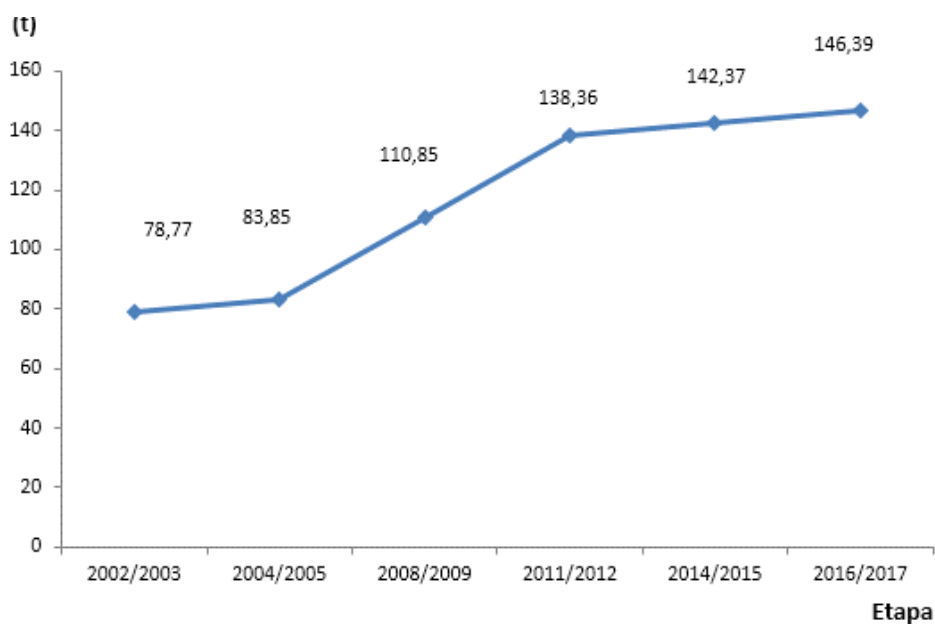
The data collection was performed monthly, through a spreadsheet with questions about quantity marketed, total value of consumer prices and percentage of losses in gondolas. The data collected were tabulated and analyzed monthly.

The sampling of the number of establishments interviewed was performed according to the criteria of Cochran [10], where in places with more than fifty commercial establishments the sample is 10%, from ten to forty establishments of 20% and less establishments of 100%. For this research conducted in the city of Lavras, Minas Gerais, Brazil, the sample was 100% of the four chains of supermarket establishments and ten retail establishments.

III. RESULTS AND DISCUSSION

According to Chart 1, in the first stage (2002/2003) they were traded on average of 78.77 t of banana per month, in the second 83.85 t (2004/2005), in the third 110,85 t (2008/2009), the fourth 138.36 t (2011/2012), the fifth 142.37 t (2014/2015) and the sixth 146.36 (2016/2017).

According to the data presented, there is an increase of 6.44% from the first to the second stage [11] and from 40.72% from the first to the third stage. From the third to the sixth stage an increase of 32.06% and from the first to the sixth of 85.84%, which demonstrates the tendency of increase in banana consumption by the population, motivated mainly by the aspects related to health and the search for a better quality of life [12].



GRAPH 1 - QUANTITY (T) OF BANANA MARKETED IN LAVRAS FROM 2002 TO 2017.

In six years, from the first to the third stage, per capita consumption of bananas in Lavras rose from 11.81 kg / inhabitant / year [11] to 20.74 kg / inhabitant / year. In that interval, consumption per capita had an increase of 8.93 kg per person per year, registering an increase of 4.38 kg per person per year.

In the 2016/2017 period, the per capita consumption of the city of Lavras was 17.22 kg / inhabitant / year, which compared to the 2002/2003 stage, which was 11.81 kg, there was an increase of 45.80% in fifteen years. In Brazil, per capita consumption in 2016/2017 was 25.00 kg / inhab / year [13], which, compared to Lavras-MG in the same period, we can say that Lavras-MG consumed less than the average of the country, that is, around 21.33 kg / person.

As shown in Graph 1, there was an increase in banana consumption over the period evaluated. This fact can be explained by the increase in the banana supply in the retail market, due to the increase in demand for the population, motivated by the behavioral changes of the population that started to seek healthier food, combined with an improvement in the purchasing power of society in general, as well as the improvement of the supply and distribution of these products by the retail network with assiduity and punctuality.

In the first stage, the banana losses in supermarket shelves and bakeries increased from 7.8% [11], to 4.6% in the following stages, according to the report of those responsible for the hortifrúti section of the establishments surveyed. There was a reduction in losses from 6.54 t / month to 3.85 t / month, ie 2.69 t / month in the second stage, 3.37 t / month in the third, 4.43 t / month / month on Wednesday, 4.56 t / month on Thursday and 4.68 t / month in the sixth stage, resulting in a reduction in waste in banana marketing. This is due to the efforts made by the management of the retailers (supermarkets and wagons) in the logistics of distribution to the final consumer.

Table 1 shows the data of Banana Prata, Nanica, Maçã and Others (Quince, Terra, Ouro, etc) marketed in the city of Lavras, MG, Brazil in the sixth stage of this research, from August 2016 to January 2017.

The average amount of banana traded in the period from August 2016 to January 2017 was 150.58 t, with a monthly average of the cultivars Prata with 102.29 t, Nanica with 37.13 t, Maçã with 8.43 t and Others with 2.73 t.

The silver banana had the largest quantity traded in October 2016, the Nanica in January 2017, the Apple in January 2017 and others, also in January 2017.

Banana Prata had an average participation of 67.93% of the total marketed, Nanica with 24.65%, Apple with 5.59% and others with 1.81%. The main types of banana produced and consumed in the country are Prata, Nanica and Maçã and, according to Andrade et al., 2017, in the south of Minas Gerais are 80%, 15% and 5% respectively [5].

Table 1 shows that the month of December was the month with the highest average supply of bananas in the city of Lavras. It can be said that this event is due to the greater supply of the fruit, accompanied by the greater demand of these products by the population, a factor motivated by the Christmas festivities and also by the increase of income, with the receipt of the 13th salary.

As for the increase in the volume of bananas marketed, it can be said that this is a consequence of the increase in productivity and quality, as well as the constant supply of these products during all months of the year. This offer, in turn, is provided by the technological development resulting from the results of continuous scientific research, which has enabled the advancement of banana farming in the various geographic regions of Brazil.

TABLE 1
VARIETIES OF BANANAS MOST COMMERCIALIZED (t) IN LAVRAS-MG, FROM AUGUST 2016 TO JANUARY 2017.

Fruit/Month	Agu/16	Set/16	Oct/16	Nov/16	Dev/16	Jan/17	Average
Silver banana	92,79	109,66	109,93	102,24	104,72	94,38	102,29
Banana nanica	28,29	27,09	33,30	40,79	47,85	53,46	37,13
Banana apple	7,45	6,811,92	8,42	8,91	9,23	9,81	8,43
Others	2,84		2,92	2,81	2,75	3,18	2,73
TOTAL	131,37	145,48	154,57	154,75	164,55	130,83	150,58

IV. CONCLUSION

The commercialization of bananas in the city of Lavras, MG, Brazil, has increased due to greater supply, quality and attendance and punctuality of delivery in the gondolas;

Technological development has provided the best banana production, throughout the year, favoring the supply of fruit to the population and driven the change of habit of people by their daily consumption.

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