



## **IS THERE A PRICE INFLUENCE AND PERSONAL CHARACTERISTICS IN THE POTATO PURCHASE DECISION? A DESCRIPTIVE STUDY**

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### **ABSTRACT**

World potato production in 2017 was over 388.2 million tons, being the fourth largest in volume in the world, where the highest world producers are China, India, Russia, Ukraine, and the United States. Brazil occupies the 21st position in the ranking of the largest potato producers in the world, with a production volume of 3.6 million tons, with the main producers being the states of Minas Gerais, Paraná, and São Paulo, which together produce the equivalent of 75 % of the Brazilian total. Knowledge about the positioning of the consumer is important for stakeholders in the potato production chain, aiming at the identification of personal factors that influence potato consumption, as well as the recognition of opportunities, seeking to meet the wishes and needs of consumers. Also, it is relevant to check consumer sensitivity to fluctuations in retail prices. Few studies show which personal aspects influence consumers' decision to purchase potatoes, as well as they react to changes in price. Thus, this study sought to identify which personal aspects influence the purchase of potatoes and how the consumer positions himself concerning changes in prices, through the analysis of primary data answered by 170 people in 38 cities of the state of São Paulo. The collected information was processed using electronic spreadsheets in Microsoft Excel software and the analyzes developing using Multiple Linear Regression with Heteroscedasticity (MLR), with the aid of the Stata 15 software. Families with children, with more than two adults in the composition, and age are the personal aspects that influence the acquisition of potatoes.



As the potato is a popular product, with easy access and relatively low prices, the levels of education and income do not interfere with consumption, since at times when prices are small the quantity consumed remains unchanged.

**Keywords:** consumption; supply; demand; horticulture; agribusiness

## 1. INTRODUCTION

World potato production in 2017 was over 388.2 million tons, harvested on 19.31 million hectares, which is the fourth largest in volume in the world, behind rice, wheat, and corn (Faostat, 2018). The largest world producers are China, India, Russia, Ukraine, and the United States, while Brazil is the 21<sup>st</sup> largest potato producing country (Faostat, 2018). It is a food widely consume all over the world, due to the ease of preparation, its characteristics, and the countless possibilities with which it can be prepare, whether traditionally cooked, fried or roasted, as well as being component of other recipes, besides be a product of affordable price for all sections of the population (Faostat, 2018).

According to Lacy and Huffman (2016), the potato has become very important in the diet of the Americans, who consume it cooked, roasted, and fried, which the Americans consumed about 52 kg per year per capita in 2013. Zaheer and Akhtar (2016) recognized that the potato has carbohydrates, proteins, vitamin C, vitamin B6, magnesium, potassium, and fiber, which makes it rich and healthy food. However, the frying process decreases the nutritional value of the potato, reducing the amount of fiber, and generating organic compounds that can even harm human health (Emily, 2018).

In the productive context, Brazil has a volume produced around 3.6 million tons, with the major producers being the states of Minas Gerais, Paraná, and São Paulo (Faostat, 2018). These three states together produce the equivalent of 75% of the total in Brazil, which corresponds to about 2.7 million tons (BIGS, 2020). All Brazilian production are destine for the domestic market and there is still a need to import, mainly seed potatoes and frozen pre-fried potatoes.

In 2017, Brazil imported 408 thousand tons of potatoes, 346 thousand tons of frozen potatoes, and 53 thousand tons of seeds, mainly from Belgium, Holland, and Argentina. The Brazilian market consumed, in 2013, the amount of 3.587 million tons of potato, which allows a per capita consumption of 17.90 kg in the year (Faostat, 2018).

The potato market is unstable and regulated by the product's supply and demand during



the year, with great uncertainties regarding the prices received by the producer (García-Salazar, Skaggs and Crawford (2014). This situation is characterized by the fact that potato producers develop their productive and commercial activities in a market of perfect competition, without any kind of power over the ways of pricing, as well as the behavior of that market. Thus, the prices in Brazil have a negative correlation with the area and volume of production (BIGS, 2020).

To understand which personal factors of consumers influence the potato purchase process, it is necessary to verify which factors make the consumer purchase such product. According to Schiffman and Kanuk (2009), this analysis can be done considering a rational approach, which defends that consumers are conscious and rational when buying a certain product, or that consumers exhibit behavior that is not so rational thus, acting subjectively.

Therefore, the consumer can control his emotions and adopts only the price and family income factors as variables that influence these purchasing decisions (Giglio, 2010). However, in the subjective approach, the decision to purchase a product is made under the influence of personal factors such as age, profession, education, family composition, personality, among others (Kotler & Keller, 2012).

Few studies show the influence of personal aspects in the context of potato acquisition in Brazil, as well as the decision to purchase these concerning fluctuations in retail prices. Hoch et al. (1995), show that demographic variables are substantial factors in the context of prices. Drèze, Nisol, and Vilcassim (2004) found that these variables influence purchasing decisions and the allocation of financial resources for families at different market levels. Likewise, a good part of consumers makes the purchase decision based on their perception of quality and value that the product will provide (Alamsyah & Angliawati, 2015).

Knowledge about these aspects is relevant for stakeholders in the potato production chain, aiming at the identification of present and future trends in potato consumption, as well as the recognition of new product development opportunities, seeking to meet potential market niches that may arise to meet the wishes and needs of consumers.

Thus, this study sought to identify which personal aspects of consumer's potatoes in the state of São Paulo influence the purchase decision. Besides, the study looked at consumer attitudes towards changes in potato prices. Therefore, admit that consumers of older age, higher income, and higher level of education consume higher quantities of potatoes, and in the face of rising prices, consumers reduce this consumption or vice versa.



This work is justify by the fact that it identifies and analyzes the profile of the potato consumer regarding the consumption of natural potatoes, addressing demographic aspects that impact the purchasing decisions concerning age, income, family size and education level. Also, the study shows consumer responses to fluctuations in the prices of natural potatoes, that is, what is the sensitivity of consumer buying in the face of price increases and reductions.

This information can subsidize producers, retailers, and wholesalers about meeting the needs and desires of consumers, as well as to create marketing strategies that provide satisfaction to customers, and can even increase consumption per capita (which is decreasing every year), promoting the market and enabling better gains for the agents of the potato production chain.

## **2. LITERATURE REVIEW**

The potato (*Solanum tuberosum* L.) is one of the most cultivated crops in the world, being the fourth largest world production, with a volume of more than 388 million tons in 2017 (Faostat, 2018). It is a dicotyledonous, herbaceous, and annual plant, with its origin mention in the Andes, between Peru and Chile, and propagate through seed potatoes, athwart which the stems, leaves, and flowers form. It is consider the main vegetable in the world, mainly for its ability to adapt to different climates, as well as for cultivation in a short time (120 days) and high production yield (above 20 tons per hectare) (Wood, Carragher & Davis, 2017; Ephrem, 2015).

Also, the potato has the advantage of ease of storage, suitability for small and large crops, and for enabling the supply of large amounts of energy and fibers (Mcfadden And Huffman, 2017). To instance, in Ethiopia potato consumption is higher than cereals and legumes, and this are due to the product demand increasing population growth, and development in potato outlets (Tegegne & Gelaw, 2019).

It is a very adaptable tuber and can be grown on all continents, and in recent years its production has grown rapidly in Asia, even in regions with hot and dry climates. Such is due to the genetic improvement of varieties, specialized for each place of the world, and also by the need for large production, meeting the growing demand for food consumption (Zaheer & Akhtar, 2016).

Brazilian potato production is mainly destine for the fresh market, which in 2014 absorbed around 1.8 million tons. This market includes the processing, classification, and packaging sectors, as well as wholesalers and retailers, which sell fresh products. In this chain



the potato is delivered by the rural producer to the processing sectors, which are formed by cooperatives, associations and companies specialized in this stage of the production process, in which the potato is washed, classified, and packaged.

After this process is finished, the potato is sent to wholesalers and retailers (Ramos, 2003), reaching the final consumer, who can prepare it in various ways, such as fried potatoes, roast, mashed potatoes, and other delicacies depending on the region in which it is consumed. Another commercialization possibility includes the delivery of the processed potato to the industry, which will be made pre-fried frozen potatoes and "Chips" potatoes (Zaheer & Akhtar, 2016).

Potatoes industrialization is increasing worldwide, mainly since there is a demand for processed products that facilitate preparation by consumers, who due to lifestyle changes, end up having little time available for preparing meals, using processed products that are quick to prepare (Emily, 2018). Research shows a decrease in the consumption of fresh potatoes and an increase in the consumption of frozen pre-fried potatoes in countries such as Ireland, the United Kingdom, and Australia, due to the advantages offered in the preparation of these foods (Emily, 2018; Wood, Carragher & Davis, 2017). The frozen food industry in Brazil consumed around 850 thousand tons of fresh potatoes in 2014, and the potato industry "Chips" absorbed around 500 thousand tons (Faostat, 2018). Thus, in both possibilities, the product goes to the final consumer, closing the potato production chain.

As the consumer is the last link in the production chain it is important to understand which personal factors influence the decision to purchase fresh potatoes, since this understanding can subsidize actions by the previous links in the chain, aiming to better serve the consumer, generating better results for the other participants, from retailers to rural producers. Thus, it is interesting to know the consumer's wishes in terms of planning the planting, determining the size of the area to be cultivated, which varieties, etc., seeking to deliver to the market a potato that provides satisfaction to consumers (Karadas et al., 2017). In this context, it is necessary to verify demographic aspects such as age group, income, education, and family composition (Victoris et al., 2016), starting with the exposure that the Brazilian population is aging, as shown in Figure 1.



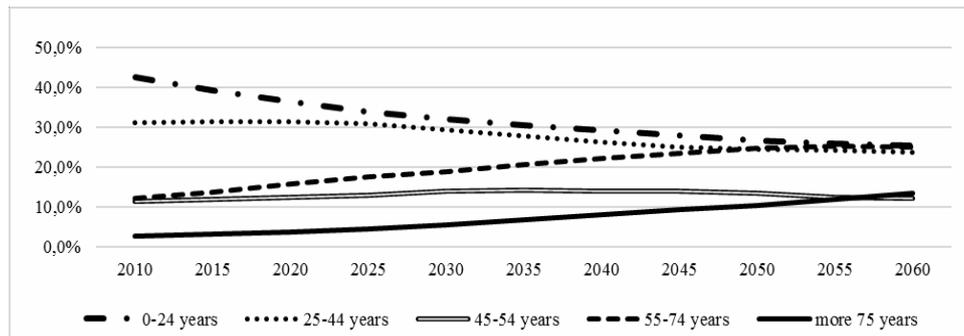


Figure 1: Brazilian population projections between 2010 - 2060 by age groups.  
 Source: information based in BIGS (2015)

As shown in Figure 1, it appears that the young population (up to 24 years old) representing 42.5% of the total population of the country in 2010, and the population above 55 years old was 15.1%. The elderly (over 75 years old) represented 3 % of the total, which show that the Brazilian population was predominantly young. However, changes are occurring in this profile, due to other demographic aspects, such as family composition e the number of children in each household, and this causes future changes in the population profile.

The projections for 2060 indicate that the young population will be 25% of the total, and the people over 55 years old will be 40%, exhibiting that in the long term there will be a predominance of elderly people in the country. This fact is corroborated by the increase in life expectancy of the Brazilian population, once in 2010 life expectancy at birth was 73 years, and projections for 2060 indicate to life expectancy at birth at 82 years (BIGS, 2015).

School education is also an impact factor in the context of consumer purchase, as Estima, Philipp, and Alvarenga (2009) show that the availability of food and access to family members is dependent on family income which is higher at higher educational levels. The level of education of the heads of the household is a strong determinant in the choice of foods at home, which generates the search for healthier products, assuming that due to greater schooling, the head of the family has greater access to information, at all levels, which allow for higher quality choices in food. Thus, through Figure 2, the educational levels of the Brazilian population are verified according to BIGS (2015).

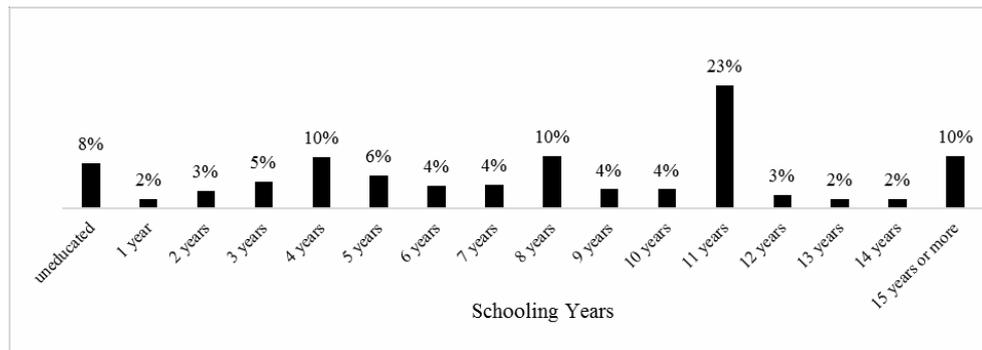


Figure 2: Brazilian population distribution by education level.  
 Source: information based in BIGS (2015).

It is possible to notice that the highest percentage of the population has eleven years of study, corresponding to high school, with 53% having at most completed elementary school (9 years of studies). On the other hand, 14% have a level of education high school (13 years) and only 10% have undergraduate or graduate (15 years or more). This situation shows that majority of the Brazilian population has education at elemental and high levels (BIGS, 2015).

Likewise, another factor that plays a role in the purchasing context is household income. For Colla (2008), income is a factor that exposes how the consumer will acquire such product, in larger quantities, or products with higher added value, as well as lace can trigger restrictions on the purchase of certain products, both in regarding the quantity of each purchase, as well as in more expensive products.

Silva (2014) studied the consumption of fiber-rich foods (such as fruits, vegetables, and whole grains), carbohydrate-rich foods (such as rice, potatoes, sugars, soft drinks, etc.), and protein-rich foods (meats, fish, eggs, etc.), and realized that fiber-rich foods are consume on a larger scale by individuals with higher income, while low-income individuals consume a greater amount of carbohydrate source foods. This is because the price is higher for fiber-based foods and lower for carbohydrate- source foods. Protein consumption fluctuated in the groups interviewed by the author, due to the various sources of existing proteins.

In this context, Coelho, Aguiar, and Fernandes (2009) realized that individuals with higher incomes acquire larger amounts of first meat, while individuals from low income buy second-hand beef, chicken, eggs, and fish. A similar study by Bonomo et al. (2003), who sought to identify the consumption profile of the habitants of Bambuí, MG, found that the low-income population practically did not consume fiber-based foods and that the consumption of carbohydrate sources are gradually reduced by increasing the income of the

population.

Within this scope, Aranceta et al. (2003) saw that families with lower incomes and less education consume more sweets and products that have high-fat rates. The researches by Figueiredo, Jaime, and Monteiro (2008) and Monteiro and Jaime (2005) found that the consumption of fruits and vegetables increases directly in proportion to the increase in the age of these individuals. According to Bigs (2020), the Brazilian population can be classified into levels of income and education, as shown in Figure 3.

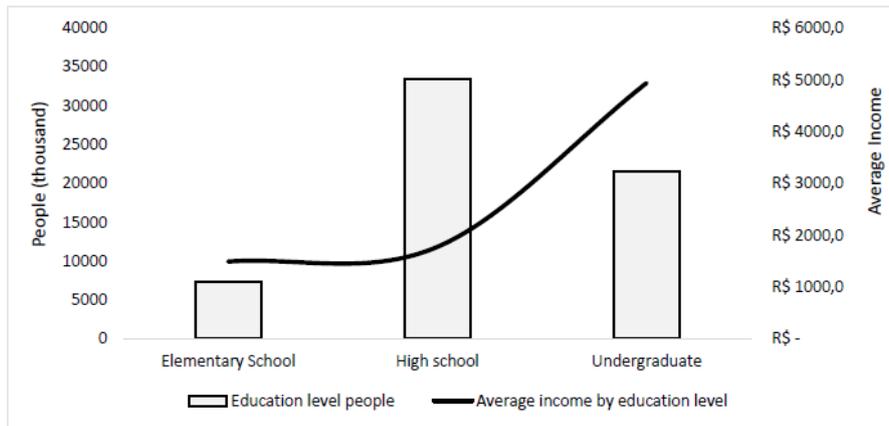


Figure 3: Average Income by Schooling Groups.  
 Source: information based in BIGS (2015).

It is understand that most of the population comprises schooling high school (41 million people), getting until two minimum monthly wages (R \$ 1,800.00), of which 7.4 million people receive to R \$ 1,400.00 monthly. As the level of education increases, the monthly salary income also rises, considering 21 million people with undergraduate education receive an average monthly income of R \$ 4,940.00.

In this analysis, the family size and the number of children also prosecute a role in the context of making purchase decisions, in which Figure 4 shows the family composition according to BIGS (2015).

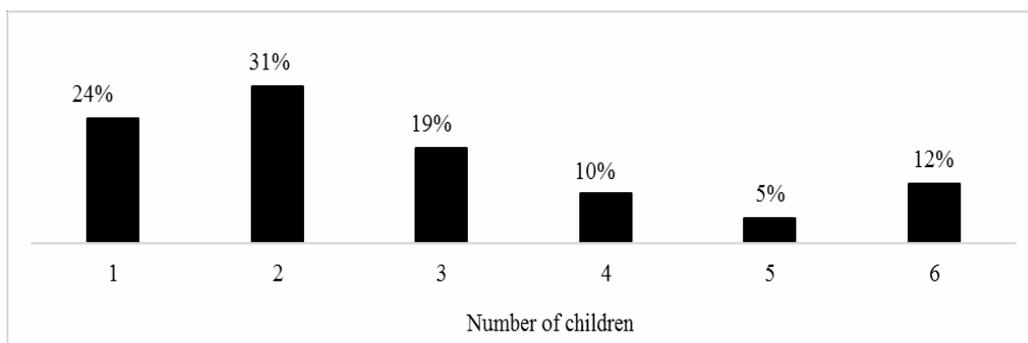


Figure 4: Family's Children.  
 Source: information based in BIGS (2015).

Note is that more than half of the families (55%) have between one and two children, with the highest percentage of families having two children (31%). Families with three children represent 19 % and those with between five and six children are 17% (BIGS, 2015).

Given the above, it is essential to analyze the official information that shows how are the consumption habits of the population. Therefore, a diagnosis of the Family Budget Survey (FBS) was carried out by the Brazilian Institute of Geography and Statistics (BIGS) in 2008/2009 (latest version), to verify how consumers' purchasing behavior about potatoes occurred, but also to compare that consumption with other food products. The average annual per capita consumption of potatoes is 5.28 kg.

However, this amount varies according to the Brazilian regions, since in the Southeast the average yearly consumption per capita is 8.34 kg while the annual per capita consumption was 1.91 kg, 1.43 kg, 6.69 kg, and 2.43 kg in the North, Northeast, South and Midwest regions, respectively (BIGS, 2011). When compare the consumption of potatoes with other goods, the research shows that in the North, Northeast, and Center-West regions potato consumption is lower than cassava (BIGS, 2011).

Another analysis pertinent to the consumption of potatoes in Brazil concerns the income factor, since families that obtain a family income of up to one minimum wage (MW) have an annual per capita consumption of 3.06 kg, as families with an income between two MW and four MW have an annual per capita consumption of 5.22 kg. For families with income between six MW and eight MW the yearly per capita consumption was 6.44 kg, and for the class of families with earnings higher than eight MW, per capita consumption annual was 7.13 kg.

Thus, it checks that the families with the highest income are those who consume the highest quantities of potatoes in Brazil during the analyzed period. Is different from the studies by Lacy and Huffman (2016), which address that the demand for fresh potatoes is not related to income, but that the families that have more adults in the composition, the consumption is higher.

In the same scope, it occurs with French fries that range from 0.07 kg per capita per year, in the class of families with income up to one MW, up to 0.36 kg per capita per year in the of families with an income greater than eight MW (BIGS, 2011).

On the other hand, the rational approach considers that the price variable tends to be the



variable with the highest impact in the context of purchases, and the price acts strongly in the short-term purchase decision, especially for consumer goods, since consumers decide the quantities to be purchased, which brand and when to make the purchase based on the behavior of product prices (Paula et al., 2008). When analyzing Figure 5, it is possible to see the fluctuations in the prices of fresh potatoes wholesale in São Paulo.

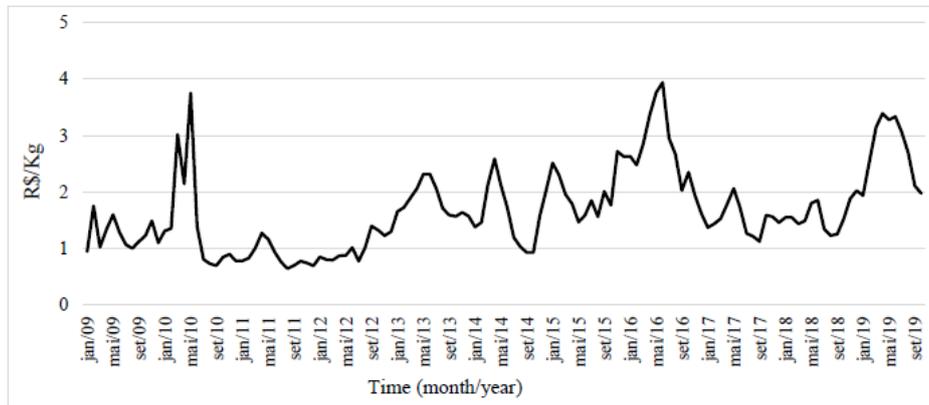


Figure 5: Wholesale potato prices in São Paulo.]  
Source: information based in CEPEA (2019).

From the above, there are large fluctuations in prices, with considerable increases and decreases over time. There is a price trend, generally, every three years of higher prices, and two periods of low prices, respectively, which is noticeable in the graph. In 2010 there was a rise in prices, reaching the maximum value of R\$ 3.75 per kg, followed by low prices, with a further price hike in 2013/2014. Likewise, there was a period of low prices in the years 2017/2018 and a new high in them in 2019.

However, there is no fixed rule for the occurrence of high or low prices, since they occur due to the dynamism of production and marketing by all Brazilian producing regions, which affects the supply and demand of the product in the various consumer markets, in the several months of the year, and this affects the formation of prices. It is a complex context, as each Brazilian producing region has its characteristics of planting, harvesting, and marketing since the principal producing states (MG, SP, and PR) commercialize the potato with practically all states in the country.

Another aspect is that the area cultivates each year is not fix, with increases and decreases, and consequently in the volume of potato production deliver to the market. These influence the formation of prices since this market is characterized by perfect competition and prices are influenced by the relationship between supply and daily demand in the various consumer markets, in addition to other variables such as freight,

storage, etc.

### 3. MATERIAL AND METHODS

The study is characterized as descriptive, as it sought to diagnose the influence of potato consumers' factors through the analysis and interpretation of facts and evidence of their routine in the context of consumption. In the same context, the research is quantitative, as it used data that was numerically encoded, with subsequent transformation into statistical results, which after due analysis collaborated with the results found.

It took place the collection of information with the aid of a questionnaire that included the research variables and presented demographic aspects (age, sex, marital status, family composition, education, and income), a feature related to the acquisition and consumption of fresh potatoes and others related to fluctuations in retail product prices as shown in Table 1.

Table 1: Definition of the variables used

Variable	Abbreviation	Comments
Fresh potato quantity	Fresh_Quant	The average amount purchased by households monthly (in kg)
Age	Age	Age
Adults	Adults	Number of adults (over 12) in the family
Children	Children	Number of children (under 12 years) in family
Income	Income	Monthly Gross Income (in R\$)
Schooling	Schooling	If 0 = Elementary or High School or 1 = Higher Education or more
Family size	Fam_Size	Number of People in Family (Total)
Low natural price	Low_Nat_Price	If 0 = Same Quantity or 1 = Other Quantities
High natural price	High_Nat_Price	If 0 = Same Quantity or 1 = Other Quantities

Source: research information

Answer the questionnaire 170 people in 38 cities, and processed the collected information using electronic spreadsheets in Microsoft Excel software, with the analysis developing using Multiple Linear Regression with Heteroscedasticity (MLR), with the aid of the Stata 15 software. The regression model is a mathematical model that relates the behavior of a variable Y with another X, and the multiple regression involves a causal relationship with more than two variables, that is, when explain Y's behavior by more than one independent variable X1, X2,... Xn (Freedman, 2009).

Furthermore, for the study to have greater consistency and robustness, it is necessary to perform statistical tests such as the Kolmogorov-Smirnov and Shapiro-Wilk normality tests, and also nonparametric tests such as Kruskal-Wallis, to verify the



existence of differences in the quantities of fresh potatoes acquired by the different interviewee profiles.

#### 4. RESULTS AND DISCUSSIONS

Which observe the descriptive statistics of the variables analyzed in the study, presented in Table 2, see that the potato consumers interviewed have an average age of 36 years, young people aged at least 18 years old, and elderly aged 72 years. This profile is like to that found in Vietoris et al. (2016), in which the dominant group was between 31 and 40 years old.

Families have between one and six members, with an average of three adults and at least one child, with the occurrence of adults living alone and families of up to six adults, as well as families that do not have children, until those that have four children in its composition. There is a heterogeneous sample, and the profile is equal to the study in Fitzsimmons and Cicia, (2018), in which the average age of the interviewees was 42 years.

Table 2: Descriptive statistics of the variables used (n = 170 observations)

Variables	Mean	Minimum	Maximum
Fresh potato quantity (kg)	2,17	0	6
Age (years)	36	18	72
Adults	3	1	6
Children	0,6	0	4
Income (R\$)	7.365	800	19.300
Schooling (years)	0,78	0	1
Family size	3,52	1	8
Low_Nat_Price	0,12	0	1
High_Nat_Price	0,35	0	1

Source: research information

The average gross family income of interviewees varies between R\$ 800.00 and R\$ 19.300,00 per month. This amplitude depending on the profile of the respondents, for whom there are undergraduate students (who live with scholarships), people with elementary and high school, and many professionals with higher education, master's and doctorate, also showing heterogeneity in the sample.

By the average exposed in table 2, it is found that 78% of respondents have higher education, being higher indicators than in the studies of Fitzsimmons and Cicia, (2018), that showed only 29% of respondents have higher education, and Vietoris et al. (2016), where 28% of respondents had a higher level. McFadden and Huffman (2017) analyzed a sample in which the average level of education was 14 years and an income of around US\$ 29 thousand per year.



Regarding the purchase and consumption of fresh potatoes, the average individual purchase is 2.17 kg per month. Regarding the prices of the product in the retail market, only 12% of the interviewees affirm that they purchase larger quantities of fresh potatoes when the price is low, showing that in this scenery the consumption situation does not change in most families due to the attraction of lower prices of the product.

However, when fresh potato prices are high, 35% of the sample says that their position changes, either by reducing the routine amount or substituting with other vegetables until the price returns to normal. This is corroborated by Zaheer and Akhtar (2016), who state that the occurrence of an increase in the price of food affects mainly low-income populations.

The Kolmogorov-Smirnov and Shapiro-Wilk normality tests showed that results in p-values less than 0.05, rejection of the hypothesis null normal distribution of data for all variables, and the Kruskal-Wallis nonparametric tests results, shown in Table 3.

Table 3: Kruskal-Wallis test considering the quantity of fresh potato acquired.

Variables	Chi-Square	D.f.	p-value
Age	65,67	45	0,02
Adults	14,57	8	0,068
Children	22,85	5	0,0004
Income	21,95	28	0,7836
Schooling	19,32	1	0,0001
Low_Nat_Price	2,95	1	0,085
High_Nat_Price	0,136	1	0,7118

Source: research information

When observing the table 3 above, it is possible to verify that there is an acceptance of the null hypothesis ( $H_0 =$  same amount) for the variables Adults, Income, Gender, Nat\_Price\_Low, and Nat\_Price\_High, with p-values less than 5%, which means for these variables do not occur changes in the quantities of potatoes purchased in the different groups. This indicator is divergent from studies by Larochelle and Alwang (2015), which found that potato consumption grows with the increase in family size.

Therefore, in families that present only one adult person, or more than one adult, the acquired quantities of potato remain constant, as it also happens for the different income groups. Regarding potato prices, consumers are not affected by product price fluctuations, indicating that the quantities purchased are constant, even if there are high and low prices between different groups of consumers. On the other hand, in the other variables, the null hypothesis



is rejected, which can be verified that groups of different ages, families with different composition (more or fewer children) e distinct levels of education, consume unlike amounts of potato monthly.

According to the age groups, there is less consumption in the youth groups (18 to 30 years old) and higher consumption in the older groups (above 50 years old), which justifies the results of the Kruskal-Wallis test. The number of adults in the family composition also shows different amounts of purchase between groups, which is why larger families buy larger quantities of potatoes in the period (Larochelle & Alwang, 2015). Likewise, there are differences in the amount purchased in families with children compared to those without children.

The level of education has differences in the amount purchased between the groups that have an education until high school, and the groups that have higher education or more, whereby the latter acquires smaller quantities than the former. The Mann-Whitney test, comparing the groups of schooling levels with the quantities of potatoes purchased, showed that there are differences between the two groups analyzed ( $p < 0.05$ ), exposing that respondents who have higher education or more, buy minors potato quantities than the group that has an elementary and high school.

When developing multiple linear regression with heteroscedasticity, considering the number of fresh potatoes acquired by the families as a dependent variable, the independent variables explain 54.06% of the variations in the quantity purchased, with the basic premise of the regression of independence of residues being maintained and p-value less than 1% in the variables shown in Table 4. Likewise, is the stat that it does not make sense to predict the other variables in the study. It is also appropriate for the regression model to present aspects of heteroscedasticity, which was used in this study.

When performing the likelihood ratio test, it are obtain that the results of the regression model with heteroscedasticity are justified on the models of ordinary least squares (at 1%), exposing that this model is the most appropriate to explain the results sample.

Table 4: Heteroscedasticity Multiple Linear Regression Analysis



<b>Fresh Potato Quant.</b>	Coefficients	S.E.	p-value
Constant	2,71	0,14	0,000***
Age	0,17	0,029	0,000***
Adults	0,28	0,26	0,000***
Children	0,50	0,120	0,000***
Family size	0,23	0,20	0,028***
High_Nat_Price	-2,01	0,25	0,000***

\*\*\*Significance at 1 %; Loglikelihood = -296.14; Chi<sup>2</sup>Wald (6) = 95.49; Prob> Chi<sup>2</sup> = 0.000 –  
 Source: research information

When analyzing the coefficients, it is seen that only the variable Price\_Nat\_High has an inverse relationship with the quantity purchased of potatoes, showing that if the price of the product increases by 100%, consumers reduce the quantity acquired by 201%. The results are similar to those found by Lee et al. (2017). This shows the sensitivity of consumers to high product prices, as there is a sharp reduction in the purchase of potatoes when prices are higher.

For significant personal factors, the results show that as the age of consumers increases, the quantity purchased becomes larger, and for each additional year, there is an increase of 0.17%. Likewise, larger families tend to consume larger quantities, whereby the growth of the family by 100%, the quantity purchased is increased by 23%.

This result is similar to that found by Pires (2016), and Seim, Vitorino and Muir (2017). Also is corroborated by the variables Adults and Children, which have coefficients of 0.28 and 0.50 respectively, showing that children and adults in the family composition generate increases in the quantity of potatoes acquired by 0.28% and 0.50% respectively.

## 5. CONCLUSIONS

The results show that potato consumption is traditional in the state of São Paulo in all demographic aspects analyzed, and practically all respondents stat that they consume the product at least once a month, in the average amount of 2.17 kg. This situation shows that there is a habit of consumer fresh potatoes, and are higher in families where the participants are older than in families formed only by younger people. Consumption is higher in groups of people over 45 years of age.

Likewise, larger families consume more potatoes, and this is related to the composition of families with children and at least two adults (conventional families made up of couples with children). This formation of families provides greater purchase of the vegetable with the other existing family forms (people who live alone and couples without children).



The level of education and income do not affect the quantities of potatoes purchased, which shows that the product is a food present in all types of homes, mainly due to its nutritional characteristics, the different forms of preparation possible and be affordable for all social classes throughout the year. The changes in prices are mainly due to the characteristics of production, consumption, and dynamism of the national market, and occur in a disorderly manner, in which a trend of low prices for two consecutive years followed by a year of higher prices.

Education, income, and position in the face of fluctuations in the prices of the product do not influence the consumption of potatoes. However, analyzing the demographic trends for the next decades, show a significant increase in the elderly population, families with fewer children (or without children) and an increasingly routine lifestyle, and the people having less free time. Furthermore, is possible to deduce that there will be an increase in the demand for potatoes, which will request greater production and lower sales prices to consumers, require that rural producers be increasingly technological, efficient, and productive, with constant reduction of total costs and improvement in product quality.

## 6. ACKNOWLEDGEMENT(S)

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## **ANEXO 1 – QUESTIONÁRIO DE PESQUISA SOBRE COMPORTAMENTO DE COMPRA DO CONSUMIDOR DE BATATA**

1. Qual a sua idade? \_\_\_\_\_ Anos
2. Quantas pessoas moram na sua casa? \_\_\_\_\_ Adultos \_\_\_\_\_ Crianças até 10 anos
3. Qual a sua renda familiar total? \_\_\_\_\_
4. Qual a sua escolaridade? \_\_\_\_\_
5. Qual o seu emprego/ profissão? \_\_\_\_\_
6. Sexo: ( ) Masculino ( ) Feminino
7. Quantas vezes consome batata inglesa “in natura”, na semana?
8. Quantas vezes na semana você compra batata inglesa “in natura”?
9. Qual quantidade de batata inglesa “in natura” você compra por semana?
10. Onde você compra batata inglesa “in natura”?
11. Quando o preço da batata “in natura” está baixo (barato), você continua comprando a mesma quantidade? ( ) Sim ( ) Não. Por quê?
12. Quando a batata “in natura” está barato (preço baixo) você compra maior quantidade que o normal? ( ) Sim ( ) Não. Por quê?
13. Quando o preço da batata “in natura” está alto (caro), você continua comprando a mesma quantidade? ( ) Sim ( ) Não. Por quê?
14. Quando a batata “in natura” está cara (preço alto) você compra menor quantidade que o normal? ( ) Sim ( ) Não. Por quê?
15. Você costuma substituir a batata “in natura” por outros legumes ou produtos ? ( ) Sim ( ) Não. Por quê?

