

## **Consumer Preferences of Tomato and Eggplant in Dili, East Timor**

Lamdor Tiurmauli Sitorus<sup>1</sup>, Pedro Damião Henriques<sup>2</sup>, Maria Raquel Lucas<sup>3</sup>

<sup>1</sup>Department of Agronomy, Agriculture Faculty, National University of Timor Lorosa'e, East Timor

<sup>2</sup>Centre for Advanced Studies in Management and Economics, Department of Economy, School of Social Sciences/ University of Évora, Portugal

<sup>3</sup>Centre for Advanced Studies in Management and Economics, Department of Management, School of Social Sciences/ University of Évora, Portugal

---

**Abstract:** *Although vegetables are popularly consumed in East Timor, there are few studies on consumer behavior and their preferences, especially those focusing on the preferences of tomato and eggplant consumers in Dili, East Timor. This study aimed to identify consumer preferences in buying tomato and eggplant in Dili, Timor-Leste. The methodology used in this study to achieve the designated objectives included two stages of information gathering. The first one regarded the acquisition of secondary information through a wide literary revision. Such included both theoretical and empirical components, framing consumer behavior and their purchase preferences. During the second stage, a primary search was outlined through a questionnaire which was given to Dili based consumers, in local markets and supermarkets. The results allowed for relevant conclusions. Albeit difficulties and limitations in research, this study still permitted the development of suggestions and guidelines for future research.*

**Keywords** – Consumers, Preferences, Tomato, Eggplant, Dili, East Timor.

---

### **I. INTRODUCTION**

In East-Timor, particularly in lower income families, the vegetable consumption at each meal is significant and usually associated with rice consumption. Frequently, the combination of rice and vegetables constitutes the essentials of daily meals. Putting aside carrots, beans and courgette, the tomatoes and eggplants are the most consumed vegetable by Timorese. In West Sumatra, eggplants are the second most consumed vegetable, immediately after green-beans. Tomato occupies the third position on the list of the 14 most consumed vegetables (green beans, eggplant, cucumber, cabbage, spinach, mandioca leaf, pare, pitulo, mustard, tomato, carrots, beans and potatoes in this region [1].

Even though vegetable consumption is popular in East Timor, there aren't any studies that speak to the specific preferences and characteristics of vegetable consumers from either a general or a specific (tomato, eggplant) standpoint. The objective of this study is to know the preferences of tomato and eggplant consumers in Dili, East Timor. It focuses on the places of purchase (local markets or supermarkets) and the specific attributes and origin of the products, whilst identifying the factors that influence and differentiate the preferences when purchasing tomato and eggplant. This study also offers recommendations to the political decision-makers, producers and consumers of eggplant and tomato with the aim of improving transaction value and create value for all those involved.

### **II. CONSUMER BEHAVIOUR AND PREFERENCES**

Since a few years ago, the consumer has become the central element in agri-food market discussion [2]. Thus, the study of the processes involving selection, purchase and consumption is crucial in order to satisfy the consumers' needs and desires, and ultimately, their behaviors [3] [4]. Consumer behavior depends of many attributes, which affects in different ways their motivation, attitudes and lead to acceptance and choice of one product, and rejecting others. It also includes actions that directly relate to the effort made in order to attain/make use of services or goods as well as the decision-making process leading to those [5]. It is particularly important for producers to know about consumer preferences [6] as they are the grounds on which decisions

involving market satisfaction and production should be based. Also, the development of an appropriate marketing strategy or a market orientation requires knowledge of consumer tastes and preferences.

The understanding of a particular food purchase and choice involves multiple areas such as biology, psychology, sociology, physiology, economics and marketing, whilst taking also into account anthropology, geography, nutrition and medicine [2]. Consumer behavior concerning food purchases is particularly complex due to the growing differentiation of products and overall heterogeneity/ dynamism in demand due to diet and health factors [7] [8]. Reviewing the literature [9] some studies identified privately-oriented attributes such as personal health or experiential eating quality as the primarily driven force to buy and choice fruit and vegetables. According to those authors, differences across countries led them to conclude that only health related aspects are similarly valued across regions, while the importance of others attributes varies considerably by consumers' place.

According to Alvensleben [10] consumer behavior can alternate between a rational choice, based on both the demand micro-economic theory and traditional decision-risk theory, or an irrational choice, based on theories of personality motivation, or behavioral consumption (models of information processing).

Amongst other consumer behavior food-applied models is Pilgrim's [11], and the more widespread Steenkamp's [12] which explains why the selection and purchase of a food product is dependent on the consumer's perception and on psychological, sensorial and environmental factors. The acceptance of a food item is therefore the result of an interaction between the item and a person at a given time [13]. The characteristics of the food items (chemical and nutritional composition, physical structure and properties) and the consumer's characteristics (genetics, age, gender, physical and mental shape) as well as the social-economic environmental qualities (familial habits, culture, religion, price, income, convenience) all influence the decision to accept or reject a food item [14].

Consumer preferences can be defined as individual desires leading to the consumption of goods and services [15] which translate into choices based on distinct factors, such as income and health and, also the number of children and full-time work of the consumers [9]. In regards to food items, consumers aren't only concerned with what they ingest but also with the quality [17] [18] and the impact that such has on their health [17] [18]. In many cases, eating has become about more than survival, hunger satisfaction or absence of disease: It has become related to nutritional value, healthy concerns and preferences and sustainable production [17] [19] [20] [21] [22].

The vegetables, as well as fruits, are recognized as important food items, rich in vitamins and minerals, fundamental to humans [23] [24]. The preference for fruits and vegetables by consumers in developed countries is mostly rooted in health concerns [2] [17] [25]. Healthy vegetables are those in which quality is perceived by the consumers through their appearance (freshness), safety (absence of pesticides & contamination) and organic production [26]. Freshness may be the deciding factor for purchase [27], as well as the product's origin (national or imported), with some findings indicating high market potential for locally grown vegetables [28] [29], such as tomatoes in Germany [28] or broccoli in USA [29]. A previous study on the consumer preferences regarding carrots, peas and cabbages in East-Timor, concluded that Timorese have a preference for vegetables that have a pleasant appearance, such as those that are fresh or that originated from biological grounds, although such qualities usually imply that these products are too expensive for the general population [24]. Consequently, in lower income families, the quality of the vegetables purchased is not taken into account, as quantity is preferred so to guarantee the consumption of vegetables by all family members, at every meal.

### **III. METHODOLOGY**

In the present study, the methodology used was quantitative, as it allows for the evaluation of characteristics, behaviors and preferences of the consumers [30]. It also has an explorative study which supports the limited knowledge on the nature of consumer preferences in East Timor [31]. In regards to investigation strategy, we used a deductive method and a quantitative approach -specifically, descriptive and transversal with explanatory purposes- so to describe the preference of tomato and eggplant consumers in Dili, East-Timor. Building on a pre-understanding of the behavior of tomato and eggplant consumers in Dili based on pre-existing theories, this method allows for a greater understanding of this theme from a practical standpoint.

The study was initiated with an extensive documental analysis, followed by a gathering of essential information through the questionnaire performed on Timorese consumers - a non-probabilistic sample, by convenience [32]. The ones enquired were selected among the total buyers population who went to supermarket and local markets in Dili. There was an attempt to reach a considerable number of

respondents of multiple nationalities, age groups, residencies, occupations, family sizes, schooling, class, social level and gender. Nevertheless we were faced with the disadvantage of being unable to generalize the results found, as the results attain only concern the specific sample. Thus, this sample had the advantage of being less costly and of simpler application [32].

The questionnaire was adapted from Correia and Rola-Rubzen [24], based on East Timor and therefore, valid in this context. The sample-size was dependent on the basic characteristics of the population, the information needed as well as the associated costs. Taking into account that there was no previous knowledge on the number of consumers of tomato and eggplant in Dili and also that it isn't possible to attain a sample that is representative of this population, we considered, instead, a sample of 60 elements for each product (eggplant & tomato) in six local markets and supermarkets located in Dili. The local markets included Halilaran, Manleu, Comoro, Bidau, those in front of Leader and Lita Store and the supermarkets Kmanek ANZ, Kmanek Lecidere e Kmanek Timor Plaza, Díli Mart, Leader and Lita Store.

The data analysis, preceded by the creation of a database, was carried out using the statistics system. The results attained were presented through a series of tables and figures that include the measurements calculations and the indicators taken as adequate. It completed two stages, the first utilizing descriptive statistics and the second inference statistics [33]. The first stage describes the sample and aims to represent the information in a concise and comprehensive manner. The second stage gathers the primary conclusions regarding this particular sample / population.

#### **IV. RESULTS AND DISCUSSION**

##### ***Characterization of the Respondents***

The socio-economic characterization of the respondents revealed that the majority of the consumers of tomato and eggplant are below 30 years of age (51.7% and 60%, respectively). The average age for tomato consumers being 32 years old and for eggplant consumers being 30 years old. The percentage of individuals above 40 years old is, in both cases, approximately 20%.

Regarding gender distribution, the majority of the buyers are females (73.3% for the tomato and 82% for the eggplant consumers). With respect with their main occupations, they can be distributed among the following categories: public services (30.0% tomato buyers and 26.7% eggplant buyers), private services (25.0% tomato buyers and 26.7% eggplant buyers), students (25.0% for tomato and 26.7% for eggplant buyers) and unemployed (18.3% in both cases). The dominant profession amongst public service are staff, teaching and nursing; amongst private service are small business owners, staff & NGO (non-governmental organization).

With regard to family size, tomato buyers usually belong to families with 6,6 members, being the majority from classes 1-4 and 5-10 members (35,0% and 55,0%, respectively). Eggplant buyers usually come from families with 7,3 members average, being that most of them belong to classes 5-10 (63.0%). In both cases (tomato and eggplant buyers), families have an income lower than 500 USD/month (86.6% for tomato and 78.4% for eggplant) and only a small percentage (13.3% tomato and 21.7% eggplant) have more than 500 USD.

Concerning nationality, most of the sample buyers are Timorese (91.7% tomato and 90.0% eggplant). The most frequent places of residency for the tomato consumers are Comoro (30.0%), Bidau Santana (13,3%) and Bairro Pite and Vila Verde (both 6,7%) and for eggplant consumers Comoro (33.3%) Akadiruhun (13.3%) and Bidau Santana (11.8).

##### ***Tomato and Eggplant Purchase Places and their characteristics***

Most tomato and eggplant consumers buy in local markets (63.3% tomato and 55.0% eggplant). Some consumers simultaneously purchase at the local markets and supermarkets (35.0% and 45.0%, respectively), while only tomato consumers purchase solely at supermarkets (1.7 %). For tomato buyers the most frequent local markets chosen are in front of the Lita supermarket (31.6%), Halilaran (30.0%) and Kmanek near ANZ (20.0%) while supermarkets are the Díli Mart and Kmanek in Timor Plaza. Buyers and consumers of eggplant attend local markets of Halilaran (41.7%), in front of Lita (26.7%) and close to Leader (15.0%) while Kmanek close to ANZ and Kmanek in Timor Plaza are the preferred supermarkets.

The reasons pointed for the choices of markets are identical for both tomato and eggplant customers: affordability (66,7% tomato and 71,7% eggplant), good quality (60,0% tomato buyers and 65,0% eggplant buyers), closeness to home / shorter commute (50,0% in both cases) and cleanness (25,0% tomato and 50% eggplant). When analyzing the distinctions between the respondents who only go to local markets versus those who go to both local markets and supermarkets, it was verified that for local markets, the affordability, good

quality and shorter commute are the crucial reasons for purchasing tomato and eggplant (Table 1).

Table 1 – Reasons for choice purchase tomato and eggplant

Reason	Tomato (%)			Eggplant (%)		
	Total	Markets	Local Markets and Supermarkets	Total	Markets	Markets and Supermarkets
Affordability	31.7	33.3	28.6	36.1	35.8	36.5
Good Quality	28.6	29.8	26.2	32.8	29.9	36.5
Closeness to home	23.8	25.0	21.4	25.2	32.8	15.4
Clean	11.9	7.1	21.4	2.5	0.0	5.8
Multiple sellers	2.4	3.6	0.0	1.7	0.0	3.8
Purchase other goods	1.6	1.2	2.4	1.7	1.5	1.9
Total	100	100	100	100	100	100

For both tomato and eggplant purchases, the most common frequency of purchase was ‘more than once a week’ (43,3% and 33,3%, respectively). In the specific case of tomato purchases, it is worth noticing the frequency of once or twice a month (30,0%) as well as once a week (18,3%),. Concerning the eggplant purchases, it is worth noting the frequency of once a week (16,7%). The unit of measurement used in the purchase is dominated by bunches (63,5% tomato and 51,7% eggplant) followed by bunches/bags in the case of the eggplants (45,0%) and bags for tomato purchases (35,0%). Bunches are mostly utilized in traditional markets whilst bags are predominantly used in supermarkets.

The quantity purchased of tomato and eggplant in bunches and bags is presented in Table 2. Its analysis revealed a small number of purchased units, one or two units, in both legumes. For tomato and eggplant, one bunch for, 61.0% and 65.6%, respectively and one bag 50.0% and 70.4 %, respectively, two bunches, 28.8% and 25.9%, respectively and two bags 36.4% and 22.2%, respectively.

Table 2 – Number of Purchased Units of Tomato and Eggplant

Number	Bunches (%)		Basket/ Bucket (%)		Bags (%)	
	Tomato	Eggplant	Tomato	Eggplant	Tomato	Eggplant
1	61.0	65.6	100	0	50.0	70.4
2	28.8	25.9	0	50	36.4	22.2
3	5.1	6.9	0	50	9.1	3.7
4	1.7	1.7	0	0	0	3.7
5	0	-	0	-	0	-
6	3.4	-	0	-	4.5	-
Total	100	100	100	100	100	100

Most of the respondents who purchase tomato and eggplant, believes that traditional markets are cheaper than supermarkets (55.0% of tomato and 63.3% of eggplant consumers) or with the same in price as supermarkets (28.3% for both products). Regarding quality perception associated with the place of purchase, the consumers and buyers of tomato believe that the supermarkets have better (41.7%) or equal quality (38.3%) when compared to local markets. However, the eggplant consumers are more divided in terms of opinion, some (40.0%) believe to have equal quality, 30.0% find that local markets have greater quality standard, and the remaining (30.0%) believes supermarkets to have greater quality.

All the respondents agreed that for both tomatoes and eggplants, the perception of quality is associated with freshness, lack of physical damage, disease and overall good flavor (Table 3). Even though 53.3% and 32.0% of the respondents associated quality to the fact that tomatoes and eggplants are organic, however, 45.0% of tomato consumers and 46.7% of eggplant consumers were not sure if these domestic products were organic.

Such reflects the need for a certifying institution that guarantees consumer security when purchasing food items, both generally and also specific to those grown organically.

Table 3 – Quality perception by tomato and eggplant consumers

Item	Yes		Not Sure		No	
	Tomato	Eggplant	Tomato	Eggplant	Tomato	Eggplant
Freshness	100	100	0	0	0	0
Free of damage	100	100	0	0	0	0
Free of Disease	100	100	0	0	0	0
Flavour	98.3	100	0	0	1.7	0
Organic without Residue	53.3	53.3	45	46.7	1.7	0

The majority of interviewees purchases tomato (86,7%) and eggplant (95%) for home consumption. The tomato is mainly consumed as a salad (76,7%) and into sauces (73,3%). The frequency for the remaining types of tomato consumption, such as juicing and in recipies were very low. The dominant combination (66,7%) is to use tomato for salads or sauces.

Consumer preferences when purchasing tomato and eggplant are variable. Concerning tomato, shape and size (71.7% and 23.3%, respectively) are the most chosen in first and second place. Also in second place is size (18,3%), freshness (15.0%) and color (13.3%). In third place is chosen size (35.0%) and color (26.7%) while ripeness (30%) holds for the fourth choice. In the specific case of eggplant, the preferred attributes are, from highest to lowest, freshness (91.7%) no disease damage (43.3% and 41.7%) and no physical damage (40.0% and 30.0%). The color is ordered as a second and fourth choice, respectively, with 20.0% and 33.3% (Table 4).

Table 4 – Ordering of Preferred Attributes when Buying Tomatoes and Eggplants

Attributes	1 <sup>o</sup> Place (%)		2 <sup>o</sup> Place (%)		3 <sup>o</sup> Place (%)		4 <sup>o</sup> Place (%)	
	Tomato	Eggplant	Tomat	Eggplant	Tomat	Eggplant	Tomat	Eggplant
Shape	71.7	-	23.3	-	1.7	-	1.7	-
Size	1.7	0.0	18.3	0.0	35.0	1.7	13.3	0.0
Ripeness	0.0	0.0	8.3	5.0	13.3	3.3	30.0	13.3
Color	13.3	5.0	13.3	20.0	26.7	5.0	16.7	23.3
No disease damage	0.0	0.0	1.7	43.3	1.7	41.7	10.0	13.3
No physical damage	0.0	1.7	3.3	6.7	1.7	40.0	3.3	30.0
Freshness	13.3	91.7	15.0	8.3	10.0	8.3	16.7	20.0
Cleanliness	-	1.7	-	16.7	-	0.0		0.0

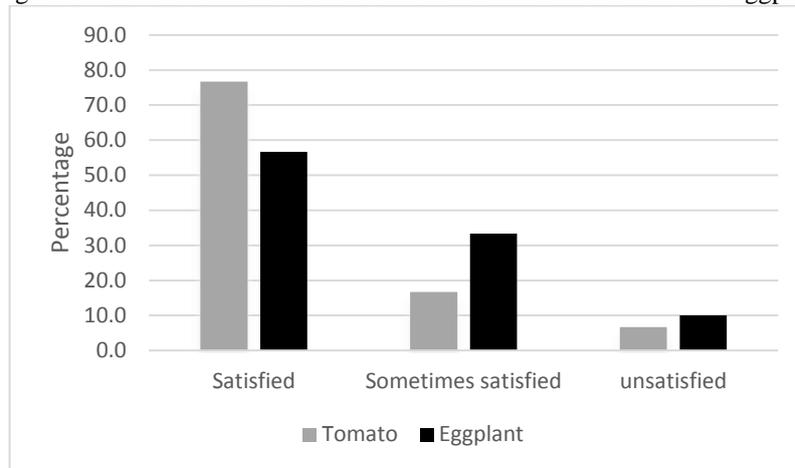
There are distinct motives for each of the above attributes chosen by Dili consumers. Regarding tomato, the preferred attributes are: a round shape (100%) due to its good presentation (68.3%) and flavor (28.3%); larger tomatoes (78.3%) that allow a larger amount of portions (100%); medium ripeness (100%) due to good presentation (69.4%) and longer conservation (41.7%); red colour (56.7%) for its good presentation (100%); no diseas damage (100%) due to lesser ease in rotting (56.7%) as well as health concerns (48.3%); no physical damage (100%) because lesser chances in rotting (55.0%) and health and sanitary concerns (55.0%); freshness (100%) due to good presentation (58.3%) and sanitary reasons (35.0%); and cleanliness (100%) for sanitary reasons.

Regarding eggplant, the preferred attributes are: an oval shape (95.0%) mainly because is the most common form (80,7%) and flavor (19.3%); a larger (55.0%) and medium size (43.3) for allowing a larger quantity of pieces (93.9% and 46.2%, respectively) and flavor (38.5%); not mature and young (88.3%) for good presentation (69.4%) and simplicity in cooking (47,2%); the violet color (78.3%) due to good presentation (72.3%) and flavor (23.4%); no disease damage (100%) due to sanitary reasons (63.3%) and lesser likelihood of rotting (48.3%); no physical damage (100%) due to lesser chances in rotting (68,3%) and also because of

sanitary reasons (55.0%); freshness (100%) due to health and sanitary reasons (100.0%); and cleanliness (100%) due to good presentation reasons (75.0%), flavor (68.3%) and sanitary reasons (51.7%).

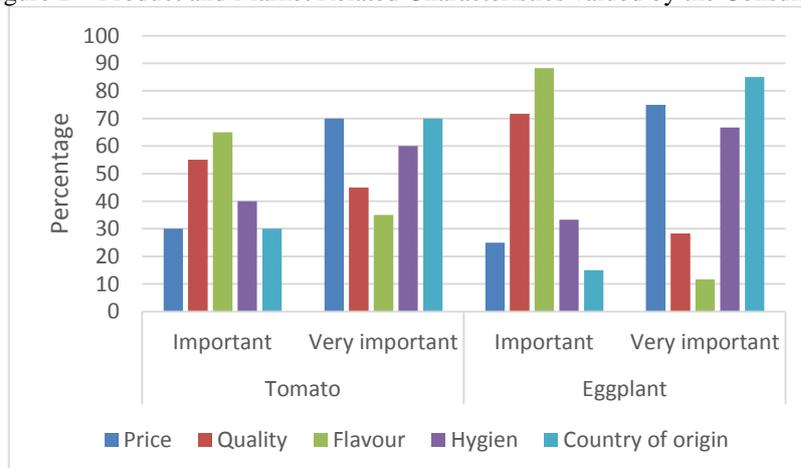
All the respondents prefer national tomatoes to imported ones and purchase national eggplant because is the only one available on the markets. The reasons for the choice of national tomatoes are its freshness (90.0%), affordability (68.3%) and organic production (60.0%). Approximately 31.7% of tomato and 35.0% of eggplant consumers claims to purchase national products quite easily while 53.3% and 58.3%, respectively, mentioned that there was occasional difficulty in purchasing local tomatoes and eggplants, particularly during the rainy season. The national level of satisfaction with tomato purchases is very high (76.7%) whereas the eggplant purchase fulfillment is only satisfactory (56.7%). There are 16,7% of the tomato consumers and 33,3% of the eggplant consumers that are only occasionally satisfied, and only 10,0% of the eggplant buyers were completely unsatisfied (Figure 1).

Figure 1 – Levels of satisfaction of local consumers for Tomato and Eggplant



Regarding ordering the preferences between national tomato and imported tomato, it was verified that local tomato is considered good (93,3%) and very good (6,7%) whereas imported tomato was considered good (58,3%) and very good (41,7%). Upon purchase, some of the characteristics related to tomato and eggplant products and its market, such as price, hygiene and country of origin are considered very important by consumers (Figure 2).

Figure 2 – Product and Market Related Characteristics valued by the Consumers



**Consumer Choice Influencing Factors**

Some of the factors behind the choices of tomato and eggplant are age, family size, gender, specific occupation nationality and income. Gender, nationality, specific occupation and age do not influence the tomato shopping location even though for age there is a tendency for younger consumes to shop at local markets, and for older people to go to both local markets and supermarkets. Family size is a factor to take into account, as larger families have a tendency to solely shop locally whereas smaller families go to both local markets and supermarkets. Income influences the choice of purchasing location of tomatoes, consumers with incomes <200 USD shop in local markets while consumers with income 200-500 USD shop both in local markets and supermarkets (Table 5).

Regarding eggplant, age, family size, gender, specific occupation and nationality do not influence market location. Only low-income consumers by at local markets while medium income consumers by at local markets and supermarkets.

**Table 5 – Shoping Location Influencing Factors of Tomato Purchases**

		Local Market (%)	Local Market and Supermarket(%)	p-value
<b>Age Classes</b>				
≤30		60,5	36,4	0,126
>30 e ≤40		26,3	31,8	
>40		13,2	31,8	
<b>Family Dimension</b>				
≤4		26,3	50,0	0,053
>5 e ≤10		57,9	50,0	
>10		16,8	0,0	
<b>Family income</b>				
≤ 200 USD		57,9	18,2	0,002
200 – 500 USD		34,2	59,1	
>500 e <1000 USD		2,6	22,7	
>1000 USD		5,3	0,0	

**Table 6 – Shoping Location Influencing Factors of Eggplant Purchases**

	Local Market (%)	Local Market and Supermarket (%)	p-value
<b>Familial Income</b>			
≤ 200 USD	63,6	14,8	0,001
200 – 500 USD	27,3	48,1	
>500 e <1000 USD	6,1	22,2	
>1000 USD	3,0	14,8	

**Results Discussion**

The purchase of tomato and eggplant in Dili is usual and can even be considered, as suggested by Alvensleben (1997) and Solomon et al (2002), as a routine and automatic decision, that although conscious, is done without much complexity, effort or involvement. Nevertheless, such does not mean that the choices and preferences of the tomato and eggplant consumers in Dili aren't influenced by multiple factors. Amongst these, primarily place of residency, socio-economic characteristics and individual product attributes.

Shepherd (1999) defends that the acceptance of a product such as tomatoes and eggplants is the result of the undergoing interaction between these and the consumer, under a specific context. It is also defended that it derives from a combination of the product's, the consumer's and the buyer's characteristics (Costell et al., 2013). The attained results support this claim, as the internal and external attributes of both tomatoes and eggplants were proven to be important and factoring in purchasing decisions (shape, size, maturation, color, absence of distinguished damage, cleanness and freshness). Considering that it was not possible to consider the nutritional composition of the products as a preference criteria, Mela (1999), we can simply conclude that

product availability, attribute presentation (shape, price, perceived quality and health security) are the primary preferential factors as mentioned by Steenkamp (1997), Grunert (1997), Garber et al (2003).

The results also support the investigations on food elements and their influence on preferences previously conducted [2]. In both cases (tomato and eggplant), these factors can be discriminated into functional and sensorial attributes (physical and organoleptic - such as shape, size, freshness, color and flavor), functional services (unit of purchase - basket, bag, cleanness) as well as psychological benefits (price, health security, quality). The consumer identification of attributes such as flavor (Shepherd, 1989; Asp, 1999, Richardson et al, 1994, Wandel and Bugge, 1997, Roininen et al, 2006), freshness and cleanness (Grande, 2005), convenience or commodity of use (Steenkamp, 1997), authenticity or genuinity of origin Grunert (1997 Miele & Parisi (2000), as well as color (Garber et al, 2003) confirm the results found by previous authors.

Besides confirming that sensorial factors and convenience are purchase influencing criteria, it was confirmed that price, health and quality are also determining when purchasing tomatoes and eggplants, which supports the works of Furst et al, (1996) and Engel et al, (1995), Ritson and Hutchins (1995) and Correia et al (2012).

When the preference is based upon price, (i.e. when consumers opt to shop locally due to cheaper prices) we can acknowledge that the consumer is choosing based on their budget, which is defined by the product prices and familial income (Alvensleben, 1997). As supported by Keller (2003) amongst others (Irala-Estevez et al, 2000; Kamphuis et. Al, 2006; Burr et. al (2007), Darmon e Drewnowski, 2008), even when consumers are able to evaluate quality, price or at least a combination of price and quality criteria is ultimately the determining factor for purchase preference when consuming fruits and vegetables.

The results attained by Neutzling et al. (2009) and Estaquio et al. (2008) support those found on this research, meaning, there is a greater preference in purchasing fruits and vegetables found among women, older individuals and individuals with greater economic power. The reason behind these findings could be that women are the main purchasing agents and tend to place more value on color and visual presentation.

In the specific case of East-Timor, the results found, even though applied to distinct products, are similar to those attained by Correia et al (2012) when researching vegetable purchase preference in both Dili and Baucau. Both these studies show that when purchasing vegetables, there is a sensibility to price and/or the consideration of both price and quality. The sense of quality being associated with freshness, absence of damage and disease, flavor and organic growing. The preference for local markets due to cheaper prices and the offer of fresher, organic available products, are also identical to the results found by Correia et al (2012).

## **V. CONCLUSION**

The information gathered allows for some interesting conclusions, particularly if one takes into account the absence of academic research/ findings on East-Timor consumers (without disregarding those conducted by Correia (2012)).

The primary conclusion to be taken from this investigation is that, although Dili consumers purchase both tomatoes and eggplants with regular frequency, price or at least a combination of quality and price are still determining factors for purchase. Quality itself can be perceived through different attributes. The majority of tomato and eggplant consumers are Timorese, female, work in both private and public services, are below 30 years old (average age for tomato being 32, and 30 for eggplant consumers), have a family composed by approximately 7 members and a familial income inferior to 500 USD.

When investigating eggplant and tomato consumer preference in regards to shopping location - local or in supermarkets- and accounting the major distribution differences between both, the results showed that most of the eggplant and tomato consumers purchase these items either in local markets or in a combination of local markets + supermarkets. Only a little amount of tomato consumers showed a preference for purchasing solely in supermarkets. When considering the commute to local markets, consumers showed a preference for the market place in front of the supermarket Lita, followed by, from most important to least important, the Haliraran market and the market in front of the Leader supermarket. Regarding consumers who shop at supermarkets, the dominant preference is the Kmanek near ANZ, followed by Dili Mart and the Kmanek on Timor Plaza. The primary reasons pointed in regards to a preference for local markets are identical for both tomato and eggplant consumers, being those the price (affordability), good quality and proximity to home, which makes the frequency of shopping runs more than once a week, dominated by the purchase of bunches. The units of supermarket purchases were different, being mostly in and bags. When comparing the places of purchase, most of the consumers of eggplant and tomato believes that traditional markets are cheaper or equal in price when compared to supermarkets. Tomato consumers also believe that local markets have equal or greater quality than supermarkets.

When concerning the consumer preferences and the motives behind tomato and eggplant purchases it is

worth mentioning that most interviewees use tomato and eggplant for domestic consumption, particularly in salads, sauces or cooking. In regards to preference itself, the motives for preference are distinct between the two products. Tomato consumers prefer shape - round with good presentation and flavor, a large size - more portions, freshness, red coloring and medium maturation - more conservation time. For the eggplant consumers, the main preference was freshness - due to health and sanitary reasons, the absence of disease and physical damage - less likelihood of rotting and finally color, which was considered least important. Upon the act of purchase, some qualities were considered important or very important for both consumers of eggplant and tomato: price, quality, flavor, hygiene, country of origin, being the first three particularly relevant.

The comparison of consumer preferences regarding local, national and imported produce whilst identifying their main differences, allowed the following conclusions: 1) Preference for national tomato instead of the imported because it is fresh, cheap and organic; 2) The purchase national eggplant because it is the only one available at supermarkets; 3) Easy accessibility to tomato and eggplant in local markets, with the exception of the rain season, when there can be a shortage of supply; and, 4) High level of satisfaction regarding the consumption of national tomato and satisfactory for national eggplant consumption, products which are considered to be good and very good.

Among the factors which influence the preferences of tomato and eggplant consumers is the familial income, being that most of the respondents with lower income have a tendency to choose local markets whereas high income respondents tend to prefer supermarkets. The respondents who shop at local markets primarily purchase eggplants in bunches whereas supermarkets purchase them in bags. When comparing the price between both types of markets it is worth mentioning that part of the respondents who shop at supermarkets believe that they are cheaper than local market. None of the respondents that shops at local markets believe that supermarkets are cheaper. Regarding the choice of shopping place, the cleanliness was emphasized, as well as the proximity to home - which is particularly relevant for those who shop in local markets. Regarding the specific characteristics of tomato and eggplant, two of them appeared to be worth mentioning, ripeness and color. Supermarket customers tend to prefer products that are less ripe but predominantly colorful. Thus, it was verified that consumers who shop at local markets tend to value quality a lot more than those who shop at supermarkets.

Finally, below are the recommendations made to political decision-makers, producers and consumers of eggplant and tomato, which aim to better the transactions and the value for all those involved:

- For producers - emphasize the importance to get the critical information that allows the familiarization and prediction of consumer behavior in every specific situation, so that they may be integrated in development projects and marketing strategies. This will allow vegetable producers to be familiar with consumer preference so to adjust or formulate marketing strategies so to attain greater profit.
- For political decision-makers - this study allows for information which can be used to support plans of action which support producers well as consumer preferred vegetable production, as well as the potential creation of an institution which supports and defends the consumer, guaranteeing certification and quality of produce.
- For the consumers - fundamental elements which determine the search for food items, so to understand the reasons behind the choices, as well as the impact of cultural and social influences.

Future research should be devoted to understanding the claims used for credence attributes and for perceptions of local vegetables that enhance trust and loyalty toward sustainable products. Targeting motivated consumers, positioning of brands and communication strategies for organic and low environmental impact should be studied in order to understand if their determinants or antecedents of preference and choice are related with attributes conferring a value added to the consumer and/or related with the production.

Also, would be interesting to analyse the environmental, economic and social impact of the short marketing chains of the fruit and vegetables distribution in East Timor. Interesting would be also to analyse the attribute "local" comparing its relevance with the organic, the certification, and the origin in order to evaluate if the consumers interpret the attribute local as an implicit quality guarantee, and/or in which one they have relatively greater confidence. As local is more common in East Timor than the others, a marketing effort to communicate aspects that may relate to local sourcing benefits, such as nutrition, environmental benefits and the willingness to support the local economy of the home region will be needed.

## **VI. Acknowledgements**

The authors are pleased to acknowledge financial support from Fundação para a Ciência e a Tecnologia (UID/04007/2020).

### **Conflicts of Interest**

The authors declare no conflicts of interest regarding the publication of this paper.

### **REFERENCES**

- [1] Hosen, N., *Preferensi Konsumen Dalam Pemilihan Sayuran Alternatif Di Sumatera Barat*. Balai Pengkajian Teknologi Pertanian Sumatera Barat, Indonesia. 2009.
- [2] Lucas, M. R., *Handbook of Consumer Behaviour* (<http://agrimba.sggw.waw.pl/>, 2006).
- [3] Blackwell, R.D., Miniard, P.W. and Engel, J.F., *Consumer Behavior*, 9th edition (Dryden Press, Harcourt College Publishers, Ft. Worth, Texas, 2001).
- [4] Solomon, M. R., Askegaard, S., Hogg, M. K. and Bamossy, G. J., *Consumer behaviour a European perspective* (Pearson Higher Education, 7th edition, 2019).
- [5] Blackwell, R.D., Miniard, P.W. and Engel, J.F: *Consumer Behavior* (The Dryden Press, Harcourt College Publishers, Ft. Worth, Texas, 9th ed, 2001).
- [6] Siró, I., Kápolna, E., Kápolna, B. and Lugasi, A., Functional food product development, marketing and consumer acceptance - a review. *Appetite*, 51(3), 2008, 456-467. doi:10.1016/j.appet.2008.05.060
- [7] Guthrie, J.F., Quantitative nutrition education research: approaches, findings, Outlook, *The Journal of Nutrition*, 124(9), 1994, 1813S-1819S. DOI:[10.1093/jn/124.suppl\\_9.1813S](https://doi.org/10.1093/jn/124.suppl_9.1813S)
- [8] Grunert, K. G., Currents issues in the understanding of consumer food choice, *Trends in Food Science & Technology*, 13, 2002, 275-285. [https://doi.org/10.1016/S0924-2244\(02\)00137-1](https://doi.org/10.1016/S0924-2244(02)00137-1)
- [9] Moser, R., Raffaelli, R., and Thilmany, D. D., Consumer Preferences for Fruit and Vegetables with Credence-Based Attributes: A Review, *International Food and Agribusiness Management Review*, 14 (2), 2011, 1-22. DOI: 10.22004/ag.econ.103990
- [10] Alvensleben, R., Consumer Behaviour in Padberg, D., Ritson, C. and Albusu, L. (Eds), *Agro-food marketing*, (Cab International, Chapter 10, 1997, 209-224).
- [11] Pilgrim F.J., The components of food acceptance and their measurement, *American Journal of Clinical Nutrition*, 5 (2), 1957, 171-175. DOI:[10.1093/ajcn/5.2.171](https://doi.org/10.1093/ajcn/5.2.171)
- [12] Steenkamp, J-B.E.M., Dynamics in consumer behavior with respect to agricultural and food products. In Wienenga B., Van Tilburg A., Grunert K., Steenkamp J- B.E.M. and Wedel M. (eds.), *Agricultural marketing and consumer behavior in a changing world*, (Kluwer Academic Publishers, 1997), Massachusetts).
- [13] Shepherd, R., Social determinants of food choice, *Proceedings of the Nutrition Society*, 58, 1999, 807-812.
- [14] Costell, E., Tárrega, A., and Bayarri, S., Food acceptance: the role of consumer perception and attitudes, *Physical and Sensory Properties Laboratory* (IATA, 2013, CSIC.)
- [15] Kotler P. and Armstrong G., *Principles of Marketing*, 17th edition (Pearson, 2017, Global Edition, 716 p.).
- [16] Lalor, F., Madden C., McKenzie, K., and Wall, PG., Health claims on foodstuffs: A focus group study of consumer attitudes. *Journal of Functional Foods*, 3, 2011, 56-59. doi:10.1016/j.jff.2011.02.00
- [17] Defrancesco, E., Perito, M., Bozzolan, I., Cei, L., and Stefani, G., *Testing Consumers' Preferences for Environmental Attributes of Pasta. Insights from an ABR Approach. Sustainability*, 9(10), 1701. doi:10.3390/su9101701
- [18] Silvestri, C., Cirilli, M., Zecchini, M., Muleo, R. and Ruggieri, A., Consumer Acceptance of the New Red-Fleshed Apple Variety, *Journal of Food Products Marketing*, 24 (1), 2018, 1-21, DOI: [10.1080/10454446.2016.1244023](https://doi.org/10.1080/10454446.2016.1244023)
- [19] Bonany, J., Brugger, C., Buehler, A., Carbó, J., Codarin, S., Donati, F., Echeverria, G., Egger, S., Guerra, W., Hilaire, C., Höller, I., Iglesias, I., Jesionkowska, K., Konopacka, D., Kruczynska, D., Martinelli, A. Pitiot, C., Sansavini, S., Stehr, R. and Schoorl, F., Preference mapping of apple varieties in Europe, *Food Quality and Preference*, 32, 2014, 317–329. doi:10.1016/j.foodqual.2013.09.010
- [20] Bonany, J., Buehler, A., Carbo, J., Codarin, S., Donati, F., Echeverria, G. Egger, S., Guerra, W, Hilaire, C., Höller, I., Iglesias, I., Jesionkowska, K, Konopacka, D., Kruczynska, D., Martinelli, A. Pitiot, C., Sansavini, S., Stehr, R. and Schoorl, F., Consumer eating quality acceptance of new apple varieties in different European countries. *Food Quality and Preference*, 30, 2013, 250–259. doi:10.1016/j.foodqual.2013.06.004

- [21] Massaglia, S., Borra, D., Peano, C. Sottile, F. and Merlino, V. M., Consumer Preference Heterogeneity Evaluation in Fruit and Vegetable Purchasing Decisions Using the Best–Worst Approach, *Foods*, 8(7), 2019, 266-; doi:10.3390/foods8070266.
- [22] Rani, N.M.and Ramachandra, K., A Study on Consumer Perception Regarding Buying Fresh Produce in Organized Retail Stores in Ban-galore, India: Do Demographics Matter?, *Theoretical Economics Letters*, 9, 2019, 2864-2884. <https://doi.org/10.4236/tel.2019.98179>
- [23] Cox, D.N., Anderson, A.S., McKellar, S., Reynolds, J., Lean, M.E.J. and Mela, D.J., Vegetables and fruits: barriers and opportunities for greater consumption, *Nutrition and Food Science*, 96(5), 1996, 44 – 47. <https://doi.org/10.1108/00346659610129251>
- [24] Correia, V. P. and Rola-Rubzen, M. F., What attributes do consumers seek when buying vegetables: the case of East Timorese consumers. *World Journal of Social Sciences*. 2 (5), 2012, 79-89. <http://hdl.handle.net/20.500.11937/5472>
- [25] Marques, C.F., *Estudo do comportamento do consumidor de alimentos funcionais*, Msc diss., University of Évora, Évora, Portugal, 2012.
- [26] Christensen, T., Denver, S., and Bøye Olsen, S., Consumer Preferences for Organic Food and for the Shares of Meat and Vegetables in an Everyday Meal. *Journal of International Food & Agribusiness Marketing*, 2019, 1–13- doi:10.1080/08974438.2019.1599758
- [27] Darby, K., Batte, M. T., Ernst, S. and Roe, B., Decomposing Local: A Conjoint Analysis of Locally Produced Foods. *American Journal of Agricultural Economics* 90(2), 2008, 476-486. DOI: 10.1111/j.1467-8276.2007.01111.x
- [28] Meyerding, S. G. H., Trajer, N., and Lehberger, M., What is local food? The case of consumer preferences for local food labeling of tomatoes in Germany. *Journal of Cleaner Production*, 207, 2019, 30–43. doi:10.1016/j.jclepro.2018.09.224
- [29] Fan, X., Gómez, M. and Coles, P., Willingness to Pay, Quality Perception, and Local Foods: The Case of Broccoli. *Agricultural and Resource Economics Review*, 48(3), 2019, 414-432. doi:10.1017/age.2019.21
- [30] Grossnickle, J., and Raskin, O., *Handbook of online marketing research* (McGraw-Hill Professional, 2001, USA).
- [31] Reynolds, P. D., *A primer in Theory Construction* (MacMillan Publishing Co., 1971, NYC).
- [32] Malhotra, N. K., *Pesquisa de Marketing: Uma orientação aplicada*. (Bookman, 6th Ed., 2011, Brazil).
- [33] Neves, E. and Domingues, C., *Manual de Metodologia da Pesquisa Científica* (Centro de Estudos de Pessoal – Cep, Escola De Aperfeiçoamento De Oficiais – Esao, 2007, Rio de Janeiro).