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Understanding Portuguese Consumers´ Perceptions of Local Food Products

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Master in Management

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BUSINESS
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Resumo

A necessidade de combater o aumento das emissões de CO_2 e as alterações climáticas impõem que a humanidade repense nas suas atividades e que aprenda a viver dentro da capacidade ambiental. Desta forma, os métodos de produção e consumo devem ser alterados em prol da sustentabilidade ambiental. Uma grande parte destas emissões nocivas provém das cadeias de abastecimento alimentar, especialmente das fases a jusante. Uma alternativa mais sustentável são as cadeias de abastecimento alimentar curtas.

Por esta razão, o objetivo desta dissertação é compreender se os consumidores portugueses estão conscientes do impacto que as longas distâncias de transporte dos produtos alimentares têm no ambiente e se estão dispostos a pagar mais por produtos alimentares que reduzirão as emissões de carbono por serem produzidos localmente. Para atingir o objetivo desta pesquisa, a recolha de dados consistiu numa observação, utilizada como estudo prévio, para confirmar as grandes distâncias de transporte e na aplicação de um questionário online para recolher informações sobre os consumidores.

Os resultados da presente investigação elucidam que os consumidores portugueses estão conscientes dos benefícios ambientais da compra de produtos alimentares locais, mas no momento da compra estes não são os fatores mais importantes na decisão. Na realidade, são os menos importantes. Apesar disso, em geral, os consumidores estão dispostos a pagar mais pelos produtos locais.

Palavras-chave: Sustentabilidade ambiental, Cadeias de abastecimento curtas, Emissões de carbono, Distâncias de transporte

Classificação JEL: D12, Q01

Abstract

The urge to combat the increase in CO_2 emissions and climate change requires humankind to rethink activities and learn to live within environmental capacity. In this manner, production and consumption methods must be altered in favor of environmental sustainability. An important part of these harmful emissions comes from food supply chains, especially downstream stages. A more sustainable alternative is short food supply chains.

For this reason, the purpose of this dissertation is to understand if Portuguese consumers are aware of the impact that long travel distances of food products have on the environment and if they are willing to pay more for food products that will reduce carbon emissions as they are produced locally. To achieve the aim of this research, the data collection consisted of an observation used as a pre-case study to confirm the lengthiness of transportation distances and the application of an online questionnaire to gather information about consumers.

The findings of the present research elucidate that Portuguese consumers are aware of the environmental benefits of purchasing local food products but at the time of purchase these are not the most important factors when making a decision. In fact, these are the least important. Despite this, in general, consumers are willing to pay price premiums for local products.

Keywords: Environmental sustainability, Short food supply chains, Carbon emissions, Travel distances

JEL Classifications: D12, Q01

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List of abbreviations

CO_2 – Carbon Dioxide

CF – Carbon Footprint

EF – Ecological Footprint

EMS – Environmental Management Systems

ES – Environmental Sustainability

EU – European Union

FAO – Food and Agriculture Organization of the United Nations

FS – Food Systems

GHG – Greenhouse Gases

GSCM – Green Supply Chain Management

INE – Instituto Nacional de Estatística

IPCC – Intergovernmental Panel on Climate Change

LCA – Life Cycle Assessments

LCSCM – Low Carbon Supply Chain Management

SC – Supply Chains

SCM – Supply Chain Management

SDGs – Sustainable Development Goals

SFSC – Short Food Supply Chains

SSCM – Sustainable Supply Chain Management

TBL – Triple Bottom Line

UK – United Kingdom

UN – United Nations

UNFCC – United Nations Framework Convention on Climate Change

WCED – World Commission on Environment and Development

WMO – World Meteorological Organization

WTP – Willingness to pay

CHAPTER 1

Introduction

1.1. Contextualization

Human activities have been increasing since the industrial revolution, releasing carbon dioxide (CO_2) and other greenhouse gases (GHG) responsible for the greenhouse effect into the atmosphere. This leads to an increase in temperatures directly impacting oceans, water, food, and health of Earth's inhabitants, jeopardizing environmental sustainability.

As a response to reduce the risks and impacts of climate change, the Paris Agreement was negotiated under United Nations Framework Convention on Climate Change (UNFCC) by 196 countries, entering into force in 2016 to hold the increase in global average temperature well below 2ºC compared to pre-industrial levels.

Globalization also has led to the interdependence between different economies and populations where goods and services are exchanged through international markets. This phenomenon has transformed how food is produced, processed, distributed, and consumed (Qaim, 2017) which in turn implies remarkably long and complex Supply Chains (SC) (Kneafsey et al., 2013). According to IPCC (2019), pre-production and post-production food activities account for 21% to 37% of anthropogenic GHG emissions.

In the Food Systems (FS), the main GHG released in the atmosphere is CO_2. Although these emissions are distributed across all the SC, transportation plays a critical role. Therefore, some researchers, politicians, and decision-makers argue that supply chains should be shortened, and countries should focus supply on products that they are self-sufficient in to reduce transportation distances. Short food supply chains (SFSCs) have been garnering research attention in recent decades as often seen as more sustainable than long food chains in terms of economic, social and environmental dimensions (Chi Ffoleau & Dourian, 2020).

Regarding the Portuguese context, retailers supply markets with products from different origins and which travel long distances, including agricultural and agroalimentary products. This research will only consider transportation distances and will analyze products that do not undergo processing or packaging activities. The focus will be on perishable products, especially apples, pears, kiwis, and oranges due to the expected growth of the quantity produced of these products for 2022, according to data from INE (2021a).

Additionally, observing values communicated by INE from 2020, the degree of self-supply in fresh fruits is 73,5%, therefore Portugal is 26,5 percentual points below self-sufficiency in

supplying these types of products. Furthermore, the category from agricultural and agroalimentary products with the highest value of imports in 2020 was "fruits; citrus peel and melons", stating the clear necessity to import fresh fruits from other countries. The problem is that one of the main suppliers of agricultural and agroalimentary products is South Africa, confirming the long distances required for products to arrive to Portugal and consequently the negative impact on the environment.

1.2. Motivations and Research Aims

The depletion of natural resources is being highlighted by various worldwide organizations to warn people toward environmental protection and more conscious choices when consuming.

These environmental concerns have been rising which impacts not only how manufactures, producers, retailers, and other entities perform their activities but also consumers buying decisions and criteria. Several studies (Aprile et al., 2015; Arsil et al., 2018; Szegedyné Fricz et al., 2020) have been conducted in different countries to analyze how consumers define local products, their perceptions and their willingness to pay (WTP) price premiums for these types of products. Clearly there is evidence that opinions regarding this topic are contradictory, suggesting the necessity to study consumers in various countries.

Under these circumstances, the author of this dissertation aims to understand the perspectives of Portuguese consumers regarding the distances traveled by food products. More specifically, to understand if consumers are aware that buying products that travel long distances is contributing to an increase in carbon emissions. In addition, it is important to understand whether consumers are willing to favor locally grown products, even if it implies having to pay higher prices for these types of products.

1.3. Research Questions and Research Objectives

To achieve the aim mentioned above, the present research is going to answer the following questions:

RQ_1: To what extend do Portuguese consumers think about products´ origin and their travel distances when purchasing food products?

RQ_2: To what extend are Portuguese consumers willing to pay more for locally grown products?

RQ_3: What are the attributes Portuguese consumers value the most in locally grown products?

In this sense, the study has the following specific objectives:

- Explore if environmental factors are valued when consumers purchase food products
- Perform an observation to confirm how long travel distances of fresh fruits are
- Perform a questionnaire to understand Portuguese consumers´ perspectives and WTP toward local food products

1.4. Structure of the dissertation

This dissertation is divided in 5 chapters. The first chapter includes an overview of the study by mentioning the context, the importance of the study, the research aim, questions, and objectives and, finally, the present structure of the dissertation.

The second chapter is the stage of literature review which analyses previous publications and contextualizes the necessary concepts for understanding the topic. The procedure for analyzing the collection of articles is presented, considering data bases, keywords, search dates, languages and spheres of research used. In the third chapter the methodology used for the collection and analysis of the data (i.e., pre-case study and questionnaire) is detailed. Fourth chapter corresponds to the study´s empirical analysis where the results are presented and interpreted both for the pre-case study as well as the questionnaire. Finally, in the fifth chapter, the conclusion from this study is exposed and research findings are discussed compared to the literature review conducted. It is also presented the limitations, suggestions for future research and the contributions to management.

CHAPTER 2

Literature Review

2.1. Literature Research

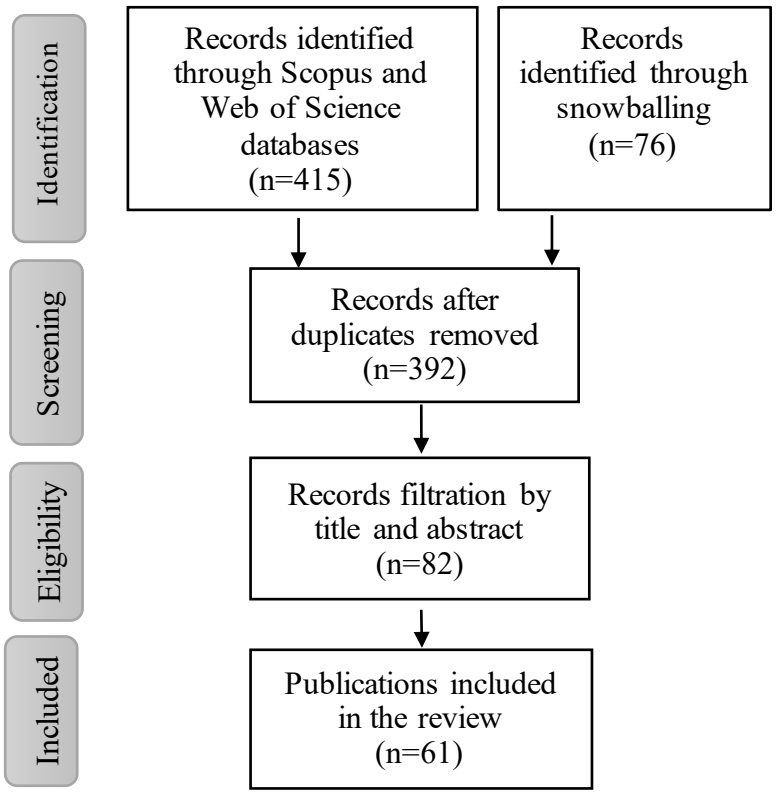
To analyze the scope of research and answer the proposed questions, a literature review was elaborated from data collected from two large data bases – Scopus and Web of Science. These databases were selected due to their availability on up to date and high-quality scientific publications.

The research was carried out in December 2021 and combined several constructions of the following keywords “Supply Chains”, “Food Supply Chain”, “Short Food Supply Chains”, “CO2 emissions”, “Carbon Emissions” and “Environmental Sustainability” that were applied to the title, abstract and full text of the publications. During this search process, results were evaluated limited to the business, management, and accounting spheres in the periods from 2016 to 2021. Search dates were defined due to the vast number of publications somehow related to the topic. Only English and Portuguese documents were selected.

Additionally, a backward snowballing procedure was then applied to a set of papers, so more publications were included and examined. This means that the author used the reference list to identify new papers and include them (Wohlin, 2014).

Considering publications gathered through data bases and backward snowballing, 491 results showed up but 99 were duplicates and were excluded. In the eligibility phase where records were filtered by title and abstract, only 82 articles were selected to pass to a full text revision phase which shows that a series of them were excluded as they were not relevant to the topic in hands. Finally, to define the main concepts, establish relationships between these and define properly the area of research, 61 publications were selected.

Figure 2.1. – Flow diagram of collection of articles for the literature review



2.2. Environmental Sustainability and Carbon Emissions

The idea of sustainability is considered as an "emerging mega-trend" which requires companies to make fundamental and persistent shifts in how they compete (Lubin & Esty, 2010). As Shrivastava and Hart (1992) mention the rise of this concept has created on organizations numerous pressures both internally and externally to reduce the environmental impact of daily activities. On one hand, external pressures come from regulations pose on environment, changes in consumer preferences for environmentally friendly products and services and a growing necessity for new corporate behaviors so societies can survive and prosper. On the other hand, internal pressures regard the change in employees´ attitudes and technological advancements enabling cleaner products and services.

Sustainability is characterized by a diverse range of definitions (Sheth et al., 2011) and interpretations, however, the Brundtland Report entitled "Our Common Future", published in 1987 by the World Commission on Environment and Development (WCED) was the major turning point for the adoption of this concept and attributed the significance and recognition it enjoys today (Alhaddi, 2015; Kuhlman & Farrington, 2010; Mebratu, 1998). The report defines sustainability on a development perspective as the "development that meets the needs of the

present without compromising the ability of future generations to meet their own needs" (WCED, 1987, p.43). Within this definition there are two key concepts: the concept of needs and the idea of limitations. Firstly, the concept of needs regards the essential needs of the world´s poor to which priority should be given and, secondly, the idea of limitations imposed by the state of technology and social organization in the environment´s ability to meet present and future needs. Fundamentally, sustainability is seen as an inter-generational equity welfare (Goodland, 1995; Kuhlman & Farrington, 2010).

Within sustainability, an important framework for measuring businesses´ performance and the success of organizations is Triple Bottom Line (TBL). Elkington (1997) coined this concept which call attention to sustainability encompassing three dimensions: social, environmental, and economic, focusing on social justice, environmental quality, and economic prosperity, respectively. The idea is that besides the bottom line of profit, a care for the environment (planet) and being good to people (social) should be added (Kuhlman & Farrington, 2010), always considering an equal level of importance of these to ensure coherence into the construct (Alhaddi, 2015).

The environmental line of TBL comprises practices that do not jeopardize environmental resources available for future generations (Alhaddi, 2015). Since the depletion of global life-support systems – atmosphere, water, and soil – is not compatible with sustainability, these systems need to be maintained and impose a time limit as their properties of regeneration are slow and cannot be hastened, imposing urgency in Environmental Sustainability (ES) (Goodland, 1995). Vezzoli and Manzini (2008) acknowledge ES as a term that refers to a condition where human activities do not disturb natural cycles more than its capacity of regenerating themselves allows and, simultaneously, do not deplete natural capital bequeath for future generations, where each person has the same amount available of natural resources. Aligned with this vision, Goodland (1995, p.10) defines ES as the "maintenance of natural capital" (i.e., the stock of assets from the environment that provide useful goods and services; can be renewable or non-renewable and marketed or non-marketed) not only as a provider of inputs but also as a "sink" for wastes. This author says that in the source side, there is a need to keep harvest rate of renewables within regeneration rates and in the sink side, waste emissions need to be hold so environment´s capacity is not impaired**.** Hence, humankind need to learn to live within the limitations of biophysical environment, producing and consuming sustainably.

To address environmental and development issues, United Nations (UN) held a global conference known as "Earth Summit" in 1992 in Rio de Janeiro. One of the major results of this conference was Agenda 21 which reflects a global consensus and a political commitment

on development and environment cooperation (United Nations (UN), 1992). Later, in 2015, another universal agenda - Agenda 2030 - was announced and consisted of 17 Sustainable Development Goals (SDGs) and 169 associated targets addressing different dimensions of sustainable development (i.e., social, economic, and environmental) to be achieved over the next 15 years. The 13th Goal highlights the need to take urgent action to combat climate change and its impacts, specifically by strengthening countries´ resilience and capacity to adapt to climate and natural related hazards, integrating measures into national policies, improving education and raise awareness of climate change mitigation both in least developed countries and Small Island Developing States (United Nations (UN), 2016).

United Nations (UN) perceive climate change as one of the greatest challenges of our time with natural resource depletion and adverse impacts of environmental degradation. Climate change is defined by the change in climate due to direct or indirect human activities that alters composition of global atmosphere and goes beyond natural climate variability observed over the years (UN, 1992). Usually, this refers to variables such as precipitation, wind and, the main focus, temperature (Arora et al., 2018). To halt these worldwide consequences, the Paris Agreement entered into force in 2016 and was adopted by the 196 Parties of UNFCCC, referred to as "the Convention", to hold the increase in global average temperature to well below 2ºC, preferably 1.5ºC, compared to pre-industrial levels. Toward achieving this, parties aimed to reach global peaking of GHG emissions as soon as possible and to prepare, communicate, and maintain successive nationally determined contributions intended to achieve a reduction of risks and impacts of climate change.

The changeability of global atmosphere is a consequence of heat-trapping greenhouse gases (GHG) emissions leading to a continuous rise in Earth´s temperature. Carbon dioxide (CO_2) is known as the most important anthropogenic GHG in the atmosphere and its concentration has reached new highs of 413.2 parts per million in 2020, representing 149% of the pre-industrial levels (WMO, 2021). As reported by World Meteorological Organization (WMO), the increase in CO_2 from 2019 to 2020 was slightly lower than the observation from 2018 to 2019. Despite that the restrictions of coronavirus disease (COVID-19) pandemic have led to a drop of approximately 5.6% of fossil fuel CO_2 emissions, these values were still higher than the average annual growth rate over the last decade. Thus, the world remains off-track in meeting the targets of the Paris Agreement and reaching net-zero CO_2 emissions globally in 2050, showing the urgency for countries to take critical steps to shift economies to carbon neutrality (United Nations (UN), 2021).

2.3. Carbon Footprint

Climate change is high up in the political and corporate agenda. Therefore, the term and concept of Carbon Footprint (CF) is becoming a widely used measure of carbon emissions across media, government, and the business world (Cembalo et al., 2013; Wiedmann & Minx, 2007).

Even though CF has become a buzzword, it seems to be no clear and widely accepted definition of the term. There is still some confusion about what it actually means, the measures, the units to be used and which gasses to include, nonetheless, CF is generally assured to be a derivation from Ecological Footprint (EF) (Jensen, 2012; Pandey et al., 2011). This later concept was proposed by Wackernagel and Rees (1996) and enables estimations of the requirements of resources consumption and wastes eliminations to sustain a certain population or economy in terms of land area. Precisely, this is the principal difference between EF and CF is that one uses land-based measures and the other mass weight of the emissions (Jensen, 2012).

Regarding CF definitions, it is possible to differentiate those that only consider CO_2 and those that broaden the scope and include all emissions of GHG. On one hand, Wiedmann and Minx (2007) include solely CO_2 emissions and defines it as a measure of the total amount caused directly and indirectly by an activity or accumulated over the life stages of a product. On the other hand, Galli et al. (2012) describe the concept englobing the total amount of GHG. Albeit the difference in definitions, including all GHG means considering other substances with global warming potential yet, not based in carbon and difficult to quantify due to lack of data (Wiedmann & Minx, 2007). Then, it seems more practical and clearer to include only CO_2.

Another important note to highlight is that when estimating CF, we need to consider all the steps from raw materials to final disposal in the case of supply chains so, Life Cycle Assessments (LCA) are used to estimate the quantity of emissions emitted during each step of product´s life cycle (Pandey et al., 2011). However, it is important to mention that quantifications may differ in the literature when referring to the same products with the same production process due to factors such as researcher choices, assumptions on key parameters and the accuracy of input data (Cembalo et al., 2013).

Despite the above, CF is a good indicator to allow consumers to be more aware of the contribution of their lifestyles to CO_2 emissions and, consequently, the pressure on the planet of their activities (Galli et al., 2012).

2.4. Green SC and Low Carbon SC Management

In the course of time, businesses stopped competing as solely autonomous entities and start competing as SC. The entities in SC include all companies/organizations which interact directly or indirectly with a focal company from the point of origin to the point of consumption (Lambert & Cooper, 2000). Lambert and Cooper (2000) refer to Supply Chain Management (SCM) as the integration and management of key business processes across SC that create value for customers and other stakeholders.

With the increase popularity of sustainability, this concept has expanded incorporating economic, ecological, and social aspects as a requirement in the coordination of those key business processes (Ashby et al., 2012; Carter & Rogers, 2008). As a result, SCM idea turn to Sustainable Supply Chain Management (SSCM) which takes into consideration the TBL of sustainability, originating a more resilient SC (Sarkis, 2020) and an improvement in profitability and competitiveness (Boroushaki et al., 2021).

Increasingly, organizations by themselves are implementing Environmental Management Systems (EMS) which are a collection of policies, assessments, plans, and implementation actions developed internally to reduce environmental burdens that affect the relationship between the organization and the natural environment (Darnall et al., 2008). According to Nishitani et al. (2015), when implementing these systems, there is an improvement in environmental performance within the organization's boundaries so, these will not lead to a significant reduction of environmental burden since the deterioration of environment occurs throughout all stages of a product´s life cycle.

A more accurate concept and a rising area of research is Green Supply Chain Management (GSCM) which extends this improvement through the entire SC, this means that a focal firm works with their suppliers toward an improvement in their environmental performance (Ashby et al., 2012). Therefore, GSCM is defined as the combination of environmental thinking with SCM in the selection and sourcing of materials, design of products, process of manufacturing, delivery of products to consumers and end-of-life management when the product reaches the end of its useful life (Srivastava, 2007). The above-mentioned environmental thinking includes subjects like pollution control, nature resource conservation and waste management (Das & Jharkharia, 2018).

Focusing on the issue in hands (i.e., reduction of carbon emissions), it is important to emphasize the adoption of Low Carbon Supply Chain Management (LCSCM). As stated by Shaharudin et al. (2019), there are two schools of thought regarding Low Carbon Supply Chains

(LCSC), one interprets LCSC as different from GSCM whereas, the second describes it as an extension of GSCM that helps firms to achieve reduction of carbon emissions. Then, LCSCM is an environmental initiative regarded as a new and special type of GSCM which intends to reduce both on-site and off-site emissions across the whole SC (Nishitani et al., 2015; Shaharudin et al., 2019). More specifically, Das & Jharkharia (2018, p.399) define LCSCM as a "strategy imperative that integrates CO_2 or CO_2e or GHG emissions either as a constraint or as an objective in supply chain design and planning". The same authors argue that the primary goal of LCSCM is to reduce carbon emissions without compromising the economic interest of firms.

2.5. Food Systems and Food Supply Chains

In the previous section, a general approach was made regarding the topic of SC but, in the current, the focus will be particularly in food systems.

Food and Agriculture Organization of the United Nations (FAO) (2019) describes Food Systems (FS) as a constitution of a core system, societal elements, and natural elements. The core system englobes the range of activities which makes food products flow (i.e., production, aggregation, processing, distribution, consumption, and disposal) and the services which support this movement, for example, labor, inputs, knowledge, and finance. Naturally, these activities are part of and are influenced by social and natural contexts. The first context encompasses policies, laws and regulations, infrastructures, and organizations while the second one includes water, soils, air, climate, ecosystems, and genetics.

The modern world has turned FS into global structures facing a "triple challenge" of providing secure and nutritious food for the global population, ensuring a decent livelihood of people who work along the food chain and ensuring environmental sustainability (OECD, 2020). Hence, it is necessary for FS to have a sustainable development concerning the three dimensions of sustainability (i.e., economic, social, and environmental), this means that the activities of FS must generate an economic value-added for stakeholders, an equity distribution of this value-added to different groups of society and a neutral or a positive impact of the activities in the natural environment (FAO, 2019). However, the projections for population growth do not seem encouraging for this sustainable development of FS. According to United Nations in their Data Booklet on World Population Prospects 2019, the global population is likely to number between 9.4 and 10.1 billion in 2050. If global FS by themselves already put significant environmental pressures such as deforestation, water usage and pollution and GHG

emissions in both local and global ecosystems, the increase in population will further stress this pressure and compromise the ability to satisfy food demand of future generations (OECD, 2020).

IPCC (2019) reported than if pre- and post-production activities of a global FS are considered, it is estimated that these emissions account for 21 to 37 percent of the total anthropogenic GHG emissions. Camanzi et al. (2017) in their study assessed that CO_2 is the most impacting gas in the food and non-alcoholic beverages in European Union-25 SC, accounting for 49 percent of the total amount of GHG emissions in almost every product category. The authors argue that, even though CO_2 emissions are distributed across many activities in different stages of SC, downstream stages such as transportation and processing are some of the hotspots where these emissions exist and must be reduced. Undoubtedly, contemporary FSC are moving towards even more long, complex and interconnected systems with intricate relationships (Van der Vorst et al., 2007) so, it is natural for them to encompass many stages and multiple nations and for perishable products to be transported across the globe (Aikins & Ramanathan, 2020). Crippa et al (2021) estimate that transportation contributes 4.8 percent to food system GHG emissions and that a key factor to determining these emissions is transportation mode, being road transportation the most preponderant corresponding to 81 percent of emissions.

Global SC showed their fragilities with the COVID-19 crisis and provided evidence that local systems are more robust and resilient, providing a rapid response to locals´ needs and a lower environmental impact regarding energy and resources consumption (Sarkis, 2020). For this reason, Short Food Supply Chains (SFSC) have been calling attention to researchers as they are perceived to be more sustainable (Chiffoleau & Dourian, 2020).

The concept was firstly developed by Marsden et al. (2000) by arguing that these types of SC can “re-socialize” and “re-spatialize” food, allowing consumers to take value judgements about the desirability of food. Basically, they seek to redefine the relationship between the producer and the consumer by clearly indicating the origin of the product. Additionally, the authors make clear that what is critical in SFSC is the fact that consumers receive products embedded with information, this means information is printed on the packaging or communicated in person at the point of retail and allows consumers to establish connections with the local of production.

For many consumers who prefer to consume green and climate friendly products it entails buying products with shorter transportation distances because it is believed that imported products are less environmentally friendly than local products (FAO, 2011). This idea is linked

with the notion of "food miles" that measures how far food travels between the production stage until de final consumer (Loiseau et al., 2020) and is seen as an indicator for assessing and defining policies regarding food systems and their sustainability on the three spheres (i.e., social, economic, and environmental) (Torquati et al., 2015).

In general, local FS are assumed to reduce energy used and CO_2 emissions for food transportation in comparison to conventional FS however, some results of food miles studies are slightly confusing**.** On one hand, some studies defend local systems and advocate that conventional FS used more fuel, released more CO_2 emissions and travel longer distances in transporting food products (Auld et al., 2009; Jones, 2002; Pirog et al., 2001). For example, Jones (2002) studied apple distribution in the UK and observed that transport related energy consumption and CO_2 emissions were lower when the product was sourced closer to the point of consumption rather than sourced globally. On the other hand, other studies do not notice a significant difference between local and non-local FS regarding energy consumption in food transportation (Glettner, 2008; Wallgren, 2006). For instance, Wallgren (2006) investigated transport energy intensity in Stockholm and did not support the idea because usually shorter distances have in return low loading capacity compared to long distances.

Therefore, when studying this matter, we must be prudent to distances, transportation modes, quantities loaded, energy efficiency of vehicle and even environmental characteristics of countries, crop, and product types (Boroushaki et al., 2021).

2.6. Consumers´ definition, perceptions and WTP for local food products

Environmental, social, and global effects of consumption have been increasing awareness between consumers, causing them to rethink their buying criteria and product choices (Huang & Rust, 2011). Therefore, several studies have been paying attention to this subject trying to understand how consumers define and perceive locally grown products and their willingness to pay a price premium for this attribute.

Regarding the local food meaning, it remains unclear and inconsistent even among the different state members of the EU (Kneafsey et al., 2013). Various approaches can be taken to define local products but generally, the geographical approach is the most common. The distances food travels between production and consumption stage (i.e., food miles) are important (Szegedyné Fricz et al., 2020) but there are different consumer characterizations about the geographical circumscription. For example, Brown (2003) analyzed southeast Missouri consumers and found that 37 percent of consumers described locally grown products

as products produced within the region of study, 23 percent considered the region plus a nearby region, 14 percent restricted to their country, another 14 percent expanded their county to the adjacent county and 12 percent considered the whole state of Missouri. Also, Harris et al. (2000) noted a diversity of opinions with some consumers considering their city limits or county and others different radius distances.

Besides the importance of understanding what consumers define as local products, it is important to explore the perceptions, factors, and the barriers for purchase these types of products. Research have been made and report that when making food choices consumers consider safety, taste and naturalness as the most important quality aspects that affect these decisions (Aprile et al., 2015). This is in agreement with Szegedyné Fricz et al. (2020) which asserts that decisions for purchasing a food product seem to be connected to quality and safety. Over the next section, economic and non-economic factors influencing perceptions of local food mentioned in the literature will be explored.

2.6.1. Economic and Non-Economic Factors

Many studies have been investigating what are the attributes that consumers associate to local foods and frequently these seem to be positive in comparison to intensive production methods (Roininen et al., 2006). Nevertheless, when segmenting population, different perceptions can be noticed regarding for example price, health benefits, support of local economies, among others (Arsil et al., 2018; Roininen et al., 2006).

Price is an important factor when making consumption decisions and for local products this is not an exception. Various authors have considered price in their studies and observed contradictory results. Arsil et al. (2018) segmented two groups of consumers in Indonesia and detected that in one segment consumers emphasized local food as inexpensive. Contrarily, Roininen et al. (2006) using the word association technique found that Finnish consumers expressed a negative association between price and local foods, meaning they considered price to be high compared to conventional produced food. According to Chambers et al. (2007), who also noted that British consumers viewed these products as more expensive, identified this as a barrier for local products purchases.

Other attributes identified in previous research are freshness, naturalness, tastiness, and good quality. Jekanowski et al. (2000) developed a probit model and found that the quality characteristics and the freshness of products produced in Indiana have a strong effect on the likelihood of consumers to buy these types of products. Consumers believe that locally grown

products are fresher due to the less travel distances until reaching final consumer (Chambers et al., 2007). Also, these products are thought to be superior in taste because of seasonality which is very important in fruits category according to Chambers et al. (2007). This is consistent with Szegedyné Fricz et al. (2020) that verified the same perceptions of Hungarians consumers, who listed "more natural" and "more delicious" as the most important characteristics of local products.

When exploring consumers´ attitudes, we must include ethical reasons that may concern consumers, such as supporting local farmers, their welfare, and the environment. However, contrary results are presented in some studies. Adams and Adams (2011) surveyed consumers and included questions covering this theme, verifying that they agreed with the statement about the purchase of local produce supporting farmer´s welfare and the benefits on the environments. Locally produced and consumed food are seen as more environmentally friendly because it reduces air pollution and oil development as the requirements for fuel for transportation are much smaller (Brown, 2003). On the other hand, Szegedyné Fricz et al. (2020) acknowledged that the environmentally friendly element of local foods had the lowest mean score among other aspects (e.g., more natural, more delicious, more nutritious, safety), meaning local foods are not perceived to be much more environmentally friendly than conventional food.

Considering all the above-mentioned attributes found in the literature, we must also consider the demographic characteristics of consumers as they influence the perceptions and their Willingness to Pay (WTP). The concept of WTP or reservation price is defined as the maximum price for a product or service accepted by a given consumer which is important as it is richer in individual information (Le Gall-Ely, 2009). This is influenced by variables such as gender, age, income, education and time and area of residency, for instance, consumers with higher incomes and who live in rural areas seem to be more likely to purchase products grown locally since they are more aware of the local economy (Jekanowski et al., 2000). Surveys conducted previously show that consumers would pay a premium price for the local attribute of their products (Adams & Adams, 2011; Darby et al., 2008).

2.6.2. Summary of Empirical Papers

In order to have a summary of empirical studies regarding the theme of the dissertation, Table 1 was developed by the author and specifies the research context, design and the dimensions of study for each paper analyzed.

Reference	Scientific Journal	Research Context	Research Design	Research Aim	Dimensions of study
Adams, D. and Adams A. (2011)	Journal of Rural Social Sciences	Florida (n=97)	Survey	Gain a deeper understanding of consumers´ perceptions and barriers for local food purchases.	1. Respondents food purchases in different categories; 2. Consumers perception on cost and difficulty in assessing these products; 3. Measure attitudes for local food on five themes: environmental protection, product quality, farmworkers welfare, health and cost/income; 4. WTP measure; 5. Frequency of food purchases in traditional/alternative venues; 6. Definition of local by distance and ownership; 7. Demographic characteristics
Aprile, M.C., Caputo, V. & Nayga, R.M. (2015)	Journal of Food Products Marketing	Italy (n=200)	Survey	Investigate consumers´ preferences and attitudes toward local food products and segment the market for this type of product	1. Importance of different attributes of food choices to consumers; 2. Consumers´ purchase behavior toward local food: shopping habits, definition of local food, attributes that influence local food purchases, perceived quality and perceptions of labels; 3. Demographic characteristics;
Arsil, P., Li, E., Bruwer, J. & Lyons, G. (2018)	British Food Journal	Indonesia (n=269)	Laddering Interviews	Investigate the reason for urban consumers to buy local food products and to segment the market based on their motivations	1. Demographic characteristics; 2.Attributes, consequences and values of local food in urban cities
Brown, C. (2003)	American Journal of Alternative Agriculture	Southeast Missouri (n=544)	Survey	Examine how southeast Missouri consumers define local food and their interest in purchasing these types of products.	1. Definition of local products; 2. Demographic characteristics; 3. Consumers´ concerns in food purchases, comparisons farmers´ market vs supermarkets and reasons for shopping in farmers´ markets; 4. Interest of consumers in labels of locally grown products; 5. WTP higher price for labelled local products
Chambers, S., Lobb, A., Butler, L., Harvey, K., & Traill W.B. (2007)	Appetite	United Kingdom (n=33)	Focus groups	Investigate consumer perceptions and behaviors toward local, national and important foods - examine if attitudes vary with socio-economic grouping	1. Demographic characteristics; 2. Definition of local, national and imported foods; 3. Cost; 4. Lifestyle, 5. Food quality, 6. Consumer etnocentrism, 7. Choice, 8. Farmers
Darby, K., Batte, M.T., Ernst, S. & Roe, B. (2008)	American Journal of Agricultural Economics	Unted States (n=530)	Survey	Investigate what is the geographical extent that consumers consider local and the values they place on local production	1. Location of production; 2. Name of firm producing strawberries; 3. Freshness guarantee; 4.Purchase price; 5. Demographic characteristics
Fricz, A.S., Ittzés, A., Osvári, L., Szakos, D. & Kasza, G. (2020)	British Food Journal	Hungary (n=898)	Survey	Examine the conditions in which Hungarian consumers consider to be a local product and the role of local origin of food in the decisions of the population in their food purchases.	1. Definition of local product; 2. Factors for food purchase decisions; 3. Characteristics of local food products; 4. Demographic characteristics;
Jekanowski, M.D., Williams II, D.R & Schiek, W.A. (2000)	Agricultural and Resource Economics Review	Indiana (n=324)	Survey	Development of a probit model to determine demographic and attitudinal factors relevant for predicting consumers likelihood for purchasing local products	1. Price and quality perceptions of local produce, 2. Number of visits over past year to local farmer markets; 3. Degree of brand loyalty; 4. Importance of product freshness; 5. Demographic characteristics
Roininen, K., Arvola, A. & Lähteenmäki, L. (2006)	Food Quality and Preference	Finland (n=55)	Laddering interviews (n=30) and Word Associations method (n=25)	Establish the personal values, meanings and specific benefits consumers relate to local food products using 2 different techniques	1. Demographic characteristics; 2. First toughts that come to mind of consumers of different types of products with different production methods

Table 2.2. – Summary of Empirical Studies

Elaborated by the author based on literature review

2.7. Synthesis

As population and human activities keep growing, more pressure is being put on the environment and compromises future generations´ welfare. The rise in GHG emissions and consequently of temperatures is one of the biggest effects of humankind on Earth which is not compatible with sustainability. Therefore, production and consumption patterns must be switched towards more environmentally sustainable options.

Cost and quality were usually the factors which dominated SC; however, environment is also becoming a critical aspect. Since business compete as SC rather than by themselves, efforts made in the organization´s boundaries will no longer reduce significantly environmental problems. For this reason, initiatives to improve environmental performance need to be extended through all the stages of SC. An implementation of LCSCM is extremely relevant when designing and planning SC to reduce CO_2 emissions.

One of the most impactful SC are FSC because perishable products are transported long distances until reaching the final consumer. As a result, their CO_2 emissions are concentrated in downstream phases which leads many authors to defend the adoption of SFSC in order to reduce transportation distances, emissions and become more sustainable. Likewise, Local FS meet these requirements, but it is not so straightforward to all products, regions, and transportation modes.

Being local FS seen as a more sustainable than conventional FS, many studies evaluate how consumers define locally grown products, their perceptions and the WTP a premium price for these types of products. Most have concluded that the definition is not clear about the geographical area comprised by the term "local" and consumers perceptions is not homogenous even among European countries. Some of the attributes that consumers link to local food products are about the quality, potential to support and improve farmers´ welfare and a positive attitude on environment. Also, demographical characteristics can also influence these perceptions and the consumers´ WTP which is of extreme importance to understand if people are actually disposed to pay higher prices for more sustainable, ethical, and higher quality products.

Under these circumstances, the author of this dissertation aims to understand the perspectives of Portuguese consumers regarding the distances traveled by food products. More specifically, to understand if consumers are aware that buying products that travel long distances is contributing to an increase in carbon emissions. In addition, it is important to

understand whether consumers are willing to favor locally grown products, even if it implies having to pay higher prices for these types of products.

CHAPTER 3

Research Methodology

3.1. Research Context

As mentioned before, the demographic characteristics of consumers influence their perceptions and their WTP for local products, therefore, to study Portuguese consumers we need to analyze the demographic distribution of the Portuguese population. By doing this we can make a comparison between the Portuguese population and the sample collected (see Appendix B).

Portugal is a southwestern European country which extends along the Atlantic coast in the Iberian Peninsula and in the archipelagos of Madeira and Azores. It has a population of more than 10 million people, of which 53% are female and 47% male (PORDATA, 2022a). It is characterized to be an aging population as for every 100 young people there are 165 elderly people (PORDATA, 2022b). Also, we observe that the age groups with the most people are those considered to be middle-aged, making the base of the pyramid smaller than the middle level (PORDATA, 2022c). The bottom of the pyramid informs that 14% and 16% of population is up to 14, and 15 to 29 years old, respectively. The next age group, 30 to 44 years old, represents 19% of total population (PORDATA, 2022c). Regarding the upper part of the pyramid, the 45 to 59 years old account for 22%, the 60 to 74 years old for 18% and, finally, the 75 years or more for 11% of population (PORDATA, 2022c). Undoubtedly, the pyramid does not have the common triangular shape and once again confirms the aging population characteristic of Portugal.

Concerning the educational level of resident population aged between 16 and 89 years old, 4% does not have any type of qualification which is a value still higher compared to other European countries (PORDATA, 2022d). The primary school was completed by 17% of this population and the 2nd and 3rd cycle constitute the highest values within the qualification groups with 25% (PORDATA, 2022d). The high school and post-secondary education depict 21% of population and for a higher level of education either a bachelor, a master, or a doctorate degree, 18% of population have accomplished it (PORDATA, 2022d).

Regarding the resident population´s occupation, 3% of population is unemployed (PORDATA, 2022e), 7% is student (PORDATA, 2022f), 6% is self-employed and 39% is a dependent worker (PORDATA, 2022g). However, an important value to highlight is the 18%

of the population, which is retired, once again corroborating the existence of an ageing Portuguese population (PORDATA, 2022f).

Considering the geographical distribution of population, we note that 73% of the population resides predominantly in cities, 14% in suburban areas and the remaining 12% in rural areas (INE, 2021b).

3.2. Research Design

To fulfill the aim of this dissertation, which is to understand the perspectives of Portuguese consumers regarding travel distances of food products, their awareness of the contribution of this situation to carbon emissions and their willingness to favor locally grown products, a mix method of research was conducted. This means that research was based in a qualitative and a quantitative method: a personal and structured observation and afterwards an online questionnaire, which was submitted to statistical analysis for summary and interpretation.

As perspectives are not a naturally quantitative phenomenon, the questionnaire allows to collect them quantitatively, further is an inexpensive and a time saver method that permits respondents´ anonymity and the ponderation of their responses (Sukamolson et al, 2007).

In the case of observation, the investigation has a longitudinal design which means that the same elements were measured over different time periods. On the other hand, the questionnaire has a cross-sectional design, so the information collected was gathered only once.

3.3. Data Collection and Analysis

As previously stated, the starting point of data collection was an observation used as a pre-case study to confirm how long travel distances seem to be in the supply of perishable food products, namely apples, pears, oranges, and kiwis that are the focus of this research.

To conduct this part of the investigation, the author visited the same two hypermarkets once a week for four weeks and registered the origins of the products under study. The results from this pre-case study were noted and then recorded in Microsoft Excel (see 4.1 pre-case study).

After gathering this information, an online questionnaire was conducted using Qualtrics survey tool, which allowed to gather and store the information provided by the respondents of the survey. Before the questionnaire was available to the respondents, a pilot test was executed to 12 people to ensure that it was understandable and clear to all possible respondents and then, the proper changes have been made.

The final version of the questionnaire was in Portuguese and contained an initial note explaining the context of the research, guaranteeing the anonymity of the answers, as well as the confidentiality of these.

The questionnaire consisted of 28 questions divided into two parts (see Appendix B). In the first part, questions were asked regarding the demographic characteristics of the respondent, namely gender, age, nationality, level of education, employment status, place of residence, household composition and household monthly income. In the second part, there were 20 specific questions to understand the perceptions and choices of consumers to:

1. Analyze the most important characteristics when buying food products (Q2);
2. Analyze how often they look at food products´ labels to see their origin (Q3);
3. Analyze consumers´ effort to find and buy local fresh products (Q4);
4. Analyze how often and where consumers usually buy their food products (Q5 and Q6);
5. Identify the main concerns in the purchase of fresh fruits (Q7);
6. Analyze the level of agreement on the interest on fresh fruits´ origin (Q8a), on thinking about travel distances (Q8b) and their environmental impact (Q8c), on the importance of knowing fresh fruits´ origin (Q8d) and on buying local food products (Q8e). Additionally, analyze the level of agreement on the fact that local products are considered to be fresher (Q8f), more expensive (Q8g), allow to improve farmers´ welfare (Q8h), tastier (Q8i), have less impact on environment (Q8j) and allow to reduce transportation distances (Q8k);
7. Identify which are the valuable attributes of local food products considered by consumers (Q9);
8. Identify what consumers perceive as local products (Q10);
9. Analyze if consumers are willing to pay more for local products rather than products that undergo long travel distances (Q11).

Regarding the response format of questions, the author applied close ended questions to avoid any error from respondents, to facilitate the response and the data analysis. Thus, formats varied between multiple choice, drill down, matrix table and slider questions in which the respondent would have to select the answer or answers that most fit.

The matrix table question consisted of 11 statements where the respondent should give the answer based on a 5-point scale – the Likert scale. The scale used in the questionnaire was: 1 – Totally disagree, 2 – Disagree, 3 – Neither agree nor disagree, 4 – Agree and 5 – Totally agree. Also, to avoid influencing and compromising the collected data, the option "6 – Don´t

know/Don´t want to answer" was added. The questions were developed based mainly on similar previous studies (Adams & Adams, 2011; Aprile et al., 2015; Brown, 2003) from the literature review and the author´s own elaboration to meet the purpose of this research.

Due to the need of a large number of responses and time constraints, a convenience sample was collected and, therefore, the questionnaire was distributed among acquaintances via social platforms such as Facebook and LinkedIn. It was online from 12th May 2022 to 27th May 2022 and 434 responses were obtained. Then, the individual answers were exported to Microsoft Excel, prepared for IBM SPSS Statistics 28 (Statistical Package for Social Sciences) and examined using this software.

CHAPTER 4

Exploratory Analysis

4.1. Pre-case study

The pre-case study was used as a support to demonstrate how long supply chains of perishable food products are and, consequently, their impact on the environment. The data gathered was organized by food product of interest, its variety, and the origin of the products in hypermarkets A and B.

In a brief analysis, apart from Portugal, the main producers and exporting countries are Brazil, Chile, Costa Rica, Ecuador, Ivory Coast, Netherlands, New Zealand, and South Africa. By looking specifically to each type of food product under observation, most of the varieties of apples available in the hypermarkets were produced in Portugal. It is possible to conclude that only 2 varieties (i.e., Fuji and Pink Lady) were imported from Chile and Brazil in hypermarket A.

Concerning bananas, in all four observations, Costa Rica and the archipelago of Madeira were the main producers, though, it was noted that Ecuador and Ivory Coast were also places of origin observed. In respect to the rest of the products, which are oranges, kiwis and pears, the origin of the food products were South Africa, New Zealand, and Portugal, correspondingly. There is only one exception from pears, registered in the last day of observation, which is that one the variety of Conference pears were originated from Netherlands.

As clearly demonstrated in Table 4.1. long travel distances are required for fresh fruits to arrive to the final consumer. These long food supply chains of perishable products have a large environmental impact as a consequence of carbon emissions generated by food miles.

			Place of origin	
Date of observation	**Food Product**	**Variety**	**Hypermarket A**	**Hypermarket B**
8th October 2021	Apples	Alcobaça	Portugal	Portugal
		Fuji	Chile and Brazil	Portugal
		Golden Delicious/Golden	Portugal	Portugal
		Brown and white reinette	Portugal	Portugal
		Pink Lady	Chile	Chile
	Bananas	N/A	Costa Rica and Madeira Island	Costa Rica and Madeira Island
	Oranges	N/A	South Africa	South Africa
	Kiwis	N/A	New Zealand	New Zealand
	Pears	N/A	Portugal	Portugal
15th October 2021	Apples	Alcobaça	Portugal	Portugal
		Fuji	Chile and Brazil	Portugal
		Golden Delicious/Golden	Portugal	Portugal
		Brown and white reinette	Portugal	Portugal
		Pink Lady	Chile	Chile
	Bananas	N/A	Costa Rica and Madeira Island	Costa Rica and Madeira Island
	Oranges	N/A	South Africa	South Africa
	Kiwis	N/A	New Zealand	New Zealand
	Pears	N/A	Portugal	Portugal
22nd October 2021	Apples	Alcobaça	N/D	N/D
		Fuji	Portugal	Portugal
		Golden Delicious/Golden	N/D	Portugal
		Brown and white reinette	Portugal	Portugal
		Pink Lady	Chile	Chile
	Bananas	N/A	Costa Rica and Madeira Island	Costa Rica and Madeira
	Oranges	N/A	South Africa	South Africa
	Kiwis	N/A	New Zealand	New Zealand
	Pears	N/A	Portugal	Portugal
29th October 2021	Apples	Alcobaça	N/D	Portugal
		Fuji	N/D	Portugal
		Golden Delicious/Golden	Portugal	Portugal
		Brown and white reinette	Portugal	Portugal
		Pink Lady	Chile	Chile
	Bananas	N/A	Costa Rica, Ecuador, Madeira	Costa Rica, Ivory Coast and Madeira
	Oranges	N/A	South Africa	South Africa
	Kiwis	N/A	New Zealand	New Zealand
	Pears	N/A	Portugal	Portugal and Netherlands

N/A - Not applicable
N/D - No data

Table 4.1 - Records for observations in hypermarkets

Elaborated by the author based on observations

4.2. Survey Results

This analysis was based on the answers collected from the questionnaire distributed to consumers. The sample collected was composed by 434 respondents, however, these were filtered according to the nationality of participants and only answers from Portuguese people were selected as this research is targeted specifically to Portuguese consumers. Therefore, the following analysis focus on 417 respondents.

4.2.1. Sample Characterization

To characterize the sample under study, demographic characteristics were asked specifically gender, age, education, occupation, living location, household constitution, nationality, and household income. From the Portuguese sample, 244 (58,8%) are females, 166 (40%) males and 3 (0,7%) non-binary people.

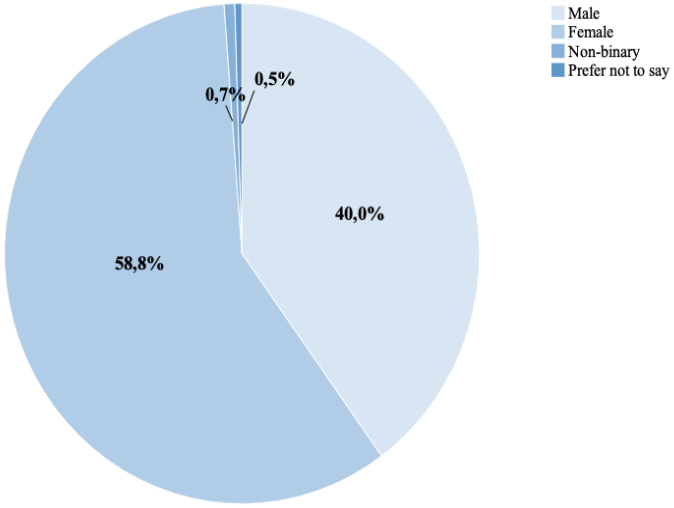


Figure 4.2 - Gender of respondents

Elaborated by the author based on questionnaire´s answers

Concerning the age of the respondents, a significant part of the respondents belongs to the 40-49 years old and the 20-29 years old categories, representing 31,2% and 24% of the sample, respectively. These groups are followed by the 50-59 years (20,6%), the 30-39 years old (13,4%) and 60-69 years old (9,1%). Also, it is important to highlight that people with 15-19 years old and 70 or more years old are the least pictured in the sample collected.

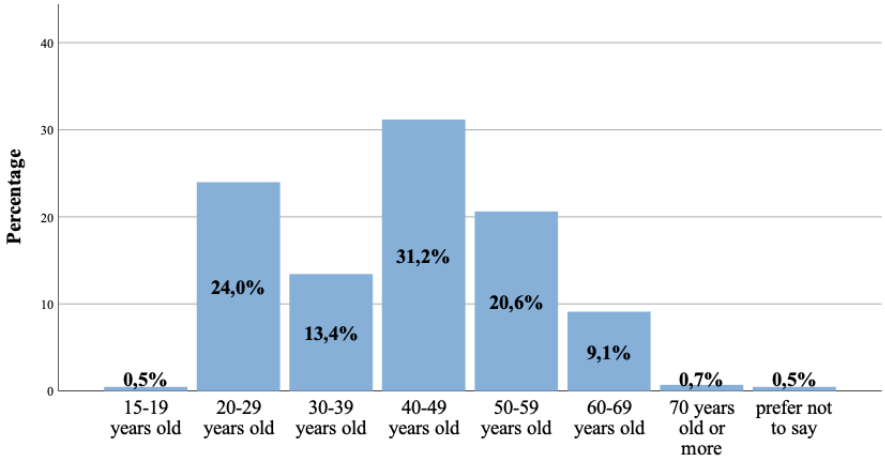


Figure 4.3 - Age of respondents

Elaborated by the author based on questionnaire´s answers

Regarding the respondents´ level of education, the most frequent response was bachelor's degree as slightly more than half of the sample (215 respondents which corresponds to 51,6%) chose this option. Furthermore, 29% and 13,2% of responses were from people with high school or a master's degree completed, accordingly.

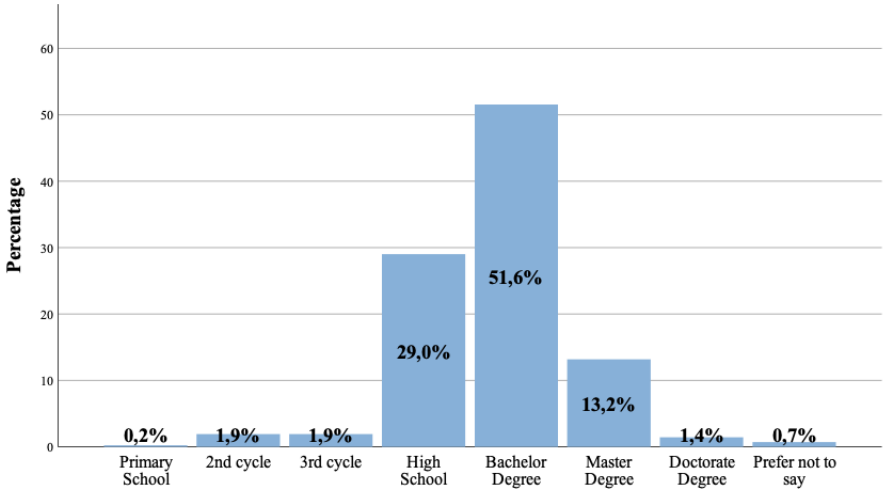


Figure 4.4 - Level of education of respondents

Elaborated by the author based on questionnaire´s answers

About the professional status, there is a preponderance of dependent workers that portray 64,3% of the sample, followed by students (14,1%). On the other hand, the least frequent professional status is unemployed (2,4%) and retired (6%) people.

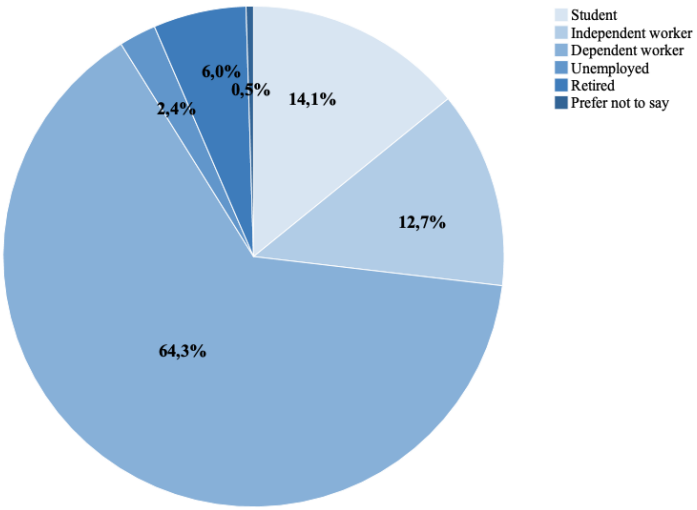


Figure 4.5 - Professional status of respondents

Elaborated by the author based on questionnaire´s answers

With respect to respondents´ living location, the generality of the responses registered were the cities (319 participants representing 76,5%), succeeded by rural area (64 participants representing 15,4%) and suburbs (34 participants representing 8,2%).

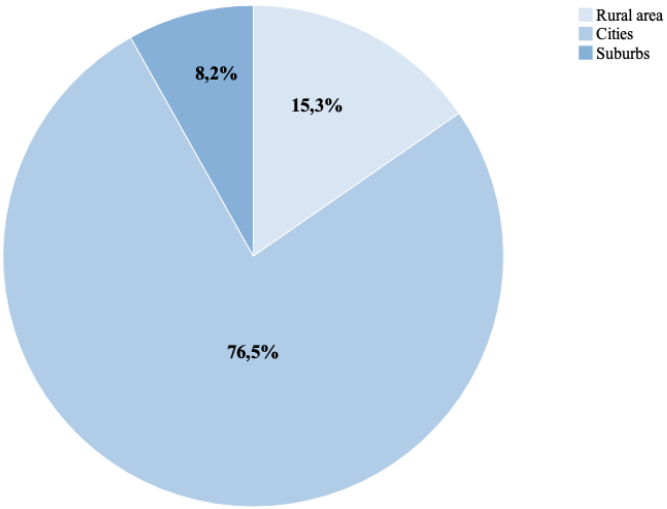


Figure 4.6 - Living location of respondents

Elaborated by the author based on questionnaire´s answers

Concerning the household constitution, 32,9% of respondents belong to a 4 person, 24,9% to a 3 person, 23,3% to a 2 person, 9,8% to a 1 person and, finally, 9,1% belong to a 5 or more people household.

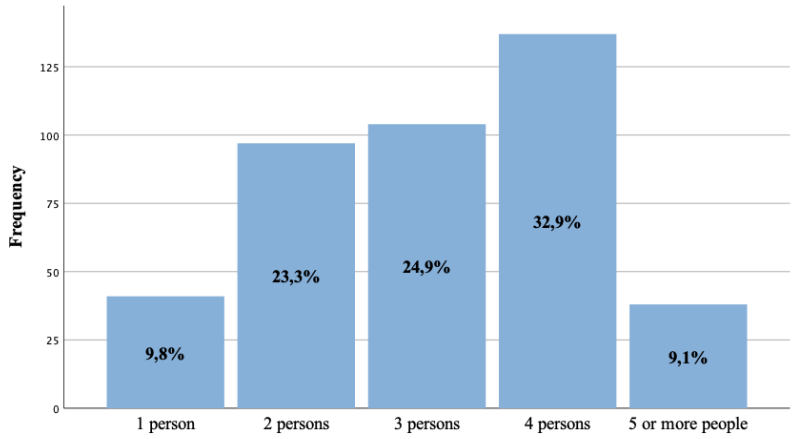


Figure 4.7 - Household constitution of respondents
Elaborated by the author based on questionnaire´s answers

Lastly, analyzing Figure 4.8, it is possible to observe that in this sample, from 414 participants, 142 (34,3%) have a household income from 1001€ to 2000€, 105 (25,4%) from 2001€ to 3000€, 105 (25,4%) more than 3000€ and, finally, 10 (2,4%) less than 700€ per month.

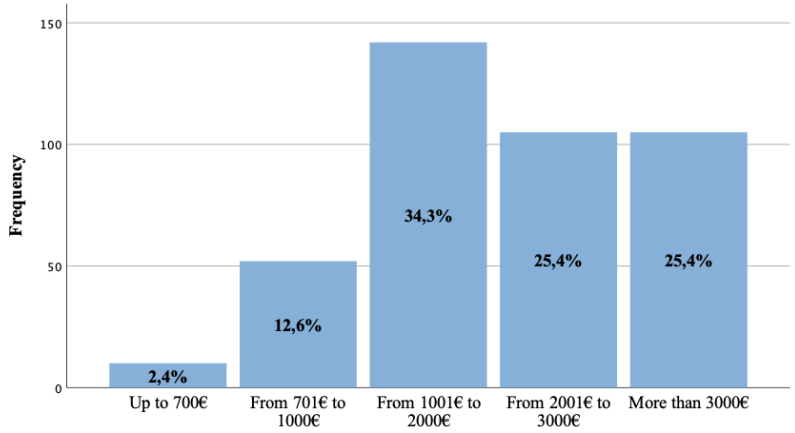


Figure 4.8 - Household income per month of respondents
Elaborated by the author based on questionnaire´s answers

1.2.1. Consumers´ perceptions and choices

The second part of the questionnaire consisted of understanding the perceptions and the choices of consumers.

The first question was about the three more important factors considered when buying food products, 63,9% of respondents selected price and 54% taste as the two most important factors. Also, food safety was the third most important factor chosen by 48,3% of the participants.

It is important to highlight that product´s origin was chosen by 39,6% of the people inquired and environmental impact was not a prominent factor influencing consumer choices (chosen by 8% of people). Moreover, 4 respondents mentioned other factors other than those suggested, namely quality and storage convenience (see Appendix C).

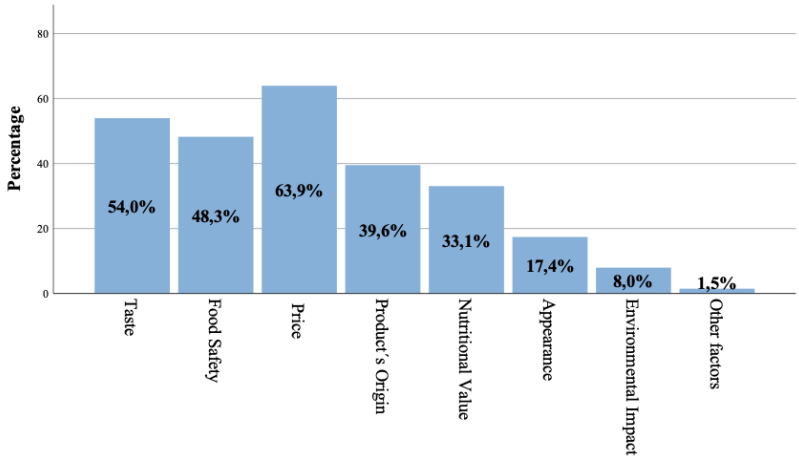


Figure 4.9 - Most important factors when buying food product
Elaborated by the author based on questionnaire´s answers

Respondents were asked about how often they look at food products´ label to check their origin (Figure 4.10). Overall, 35,7% indicated to check the origin of the products Frequently/Regularly on their labels and 35,2% check only sometimes. Nineteen percent mentioned that they always check the origin whereas 9% never check it.

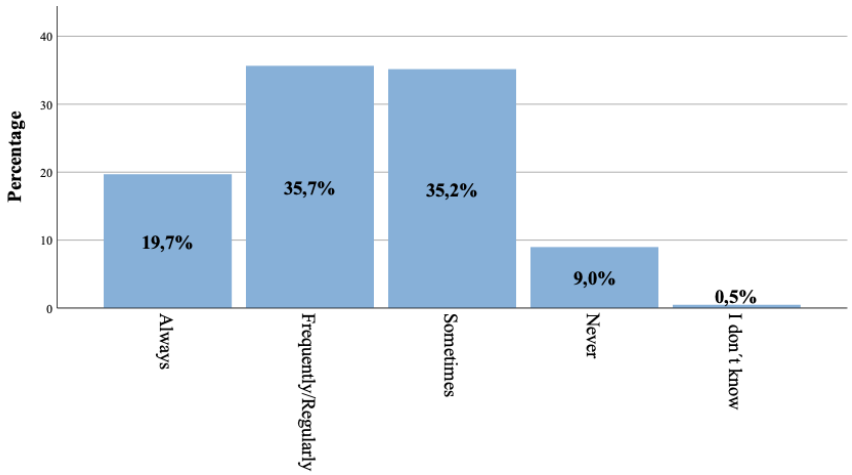


Figure 4.10 - Frequency in looking at food product´s labels to see their origin
Elaborated by the author based on questionnaire´s answers

Food buyers were asked how frequently they make an effort to find and buy fresh local food products. Forty three percent of respondents revealed that they Frequently/Regularly search for and try to buy these types of products. Also, 29,1% answered that they only do this sometimes and 21,3% does it always. Only 5% of consumers stated that they never make an effort to find these types of products.

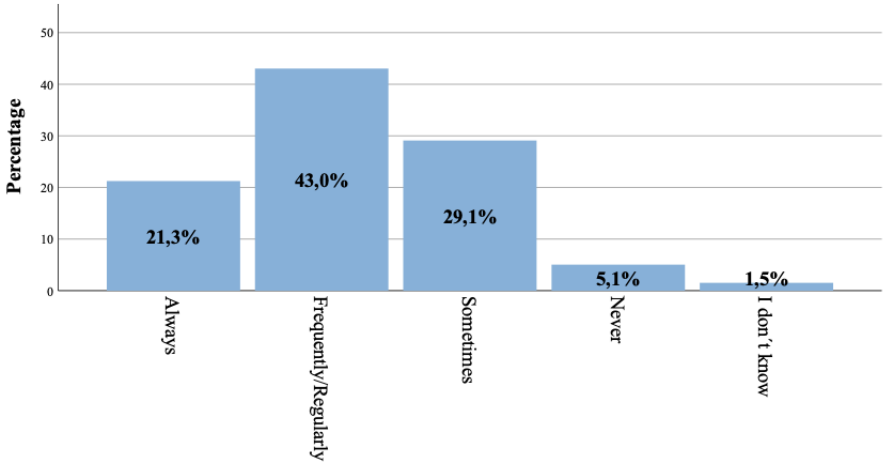


Figure 4.11- Effort to find and buy fresh local food products

Elaborated by the author based on questionnaire´s answers

The survey also asked food buyers how often and where they buy their food products. Regarding the consumers´ purchasing frequency (Figure 4.12), the majority (52,5%) does their shopping once a week, 27,6% does twice a week and 16,4% does three times or more per week. Only 3,5% have mentioned to buy their food once a month.

About where consumers buy most of their food products (Figure 4.13), most of them stated that is in supermarkets (56,2%) and in hypermarkets (27,2%) where they do their shopping, while other mentioned they purchase at local markets (9%) and grocery stores (6,1%). A small percentage of respondents buy food products directly to producers (1,2%) and just one consumer indicated that his food products come from own cultivation (0,2%) (see Appendix D).

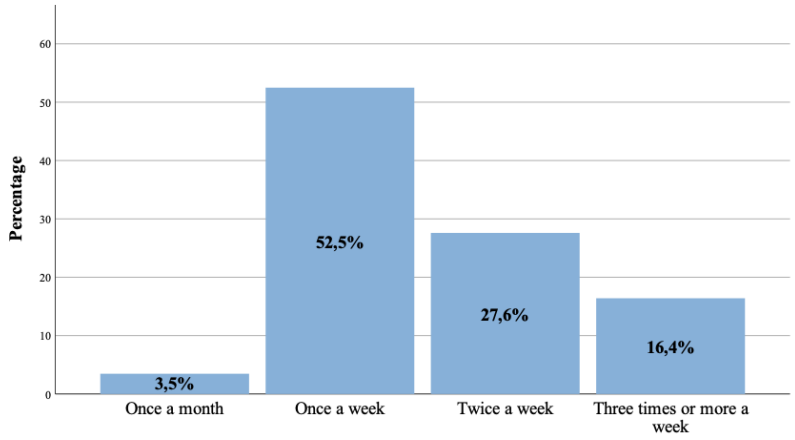


Figure 4.12 - Frequency on buying food products

Elaborated by the author based on questionnaire´s answers

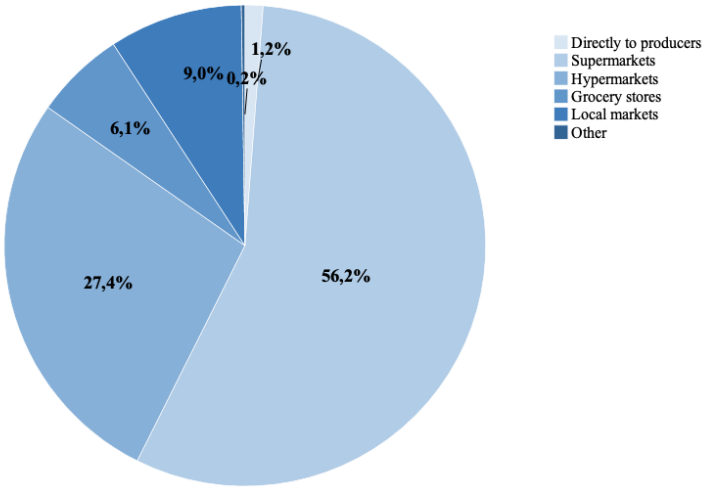


Figure 4.13 - Places where consumers buy most of their food products

Elaborated by the author based on questionnaire´s answers

The second block of questions was specifically focused on perceptions and consumer´s choices of fresh fruits, namely apples, kiwis, oranges, and pears. In the first question consumers were asked about their three major concerns when buying these types of fruits. Ninety two percent of consumers reported quality/freshness and 64,4% price as the two main concerns. Additionally, 57,4% of respondents chose the product´s origin as the third concern that influence their choices. Transportation distances (3,7%) and ecological footprint (4,5%) came as the least concerns. Also, 6 respondents highlighted factors such as appearance, fruit seasonality, no pesticides and taste as other critical concerns (see Appendix E).

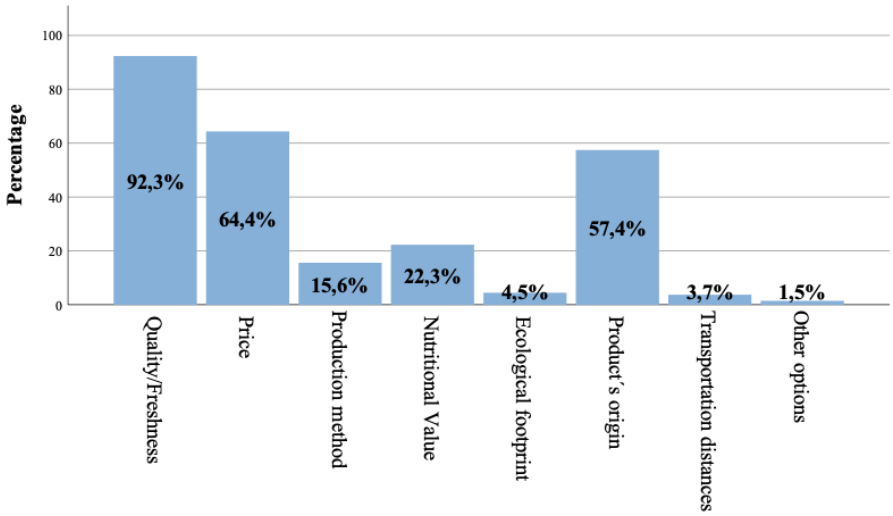


Figure 4.14 - Major concerns when buying fresh fruits

Elaborated by the author based on questionnaire´s answers

In order to understand the level of agreement among consumers, they were asked to rank statements using a 5-point Likert-scale with 1 meaning totally disagree and 5 totally agree. (Figure 4.15). Of the statements presented, "Local food products allow to reduce transportation distances" and "Buying local food products helps to support and improve farmers´ welfare" were the ones with the highest mean of 4,4, which means that Portuguese consumers strongly agree with these assertations. On the other hand, the statement with the lowest mean of 3 was "When I buy fresh fruit I think about its ecological footprint (CO_2 emissions)" as 38,8% of respondents chose the option neither agree or nor disagree, showing truly indifference towards this topic (see Appendix F).

An important result to emphasize is the mean of 3,6 for the statement "Local food products are more expensive than conventional products" in which almost half of the sample (47,7%) agreed and 27,2% neither agree nor disagree with the affirmation (see Appendix G). Furthermore, consumers agreed that it is important to buy locally produced food (mean of 4,3), that these products are fresher (mean of 4) and tastier (mean of 4,1) than conventional food products and have less environmental impact (mean of 3,9).

Finally, it is worth noticing the mean of 3,3 for "When I buy fresh fruits, I think about the distance products travelled" in which the 31,3% of respondents agree and 31,3% neither agree nor disagree with the statement (see Appendix H).

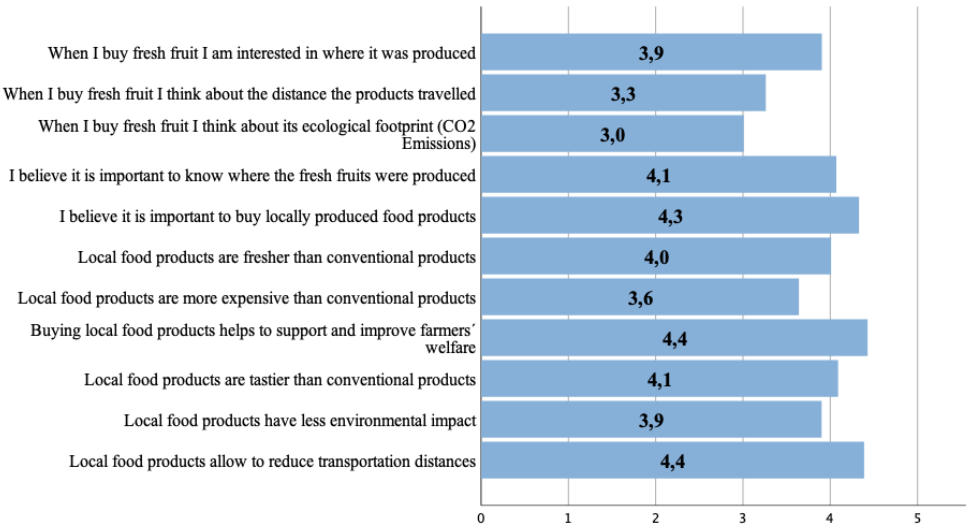


Figure 4.15 - Mean of the level of agreement of the statements

Elaborated by the author based on questionnaire´s answers

As a way of understanding the attributes of local food products consumers value the most, they were asked to choose three of the proposed options or to indicate a different one. By analyzing Figure 4.16 it is observable that 76,3% of respondents selected taste and 74,3% freshness as one of the most valuable attributes. The third most important attribute for consumers was price as 39,1% of respondents chose this option.

With regard to the least valued attributes, these were the possibility of local products to reduce both the ecological footprint of products (5%) and the reduction of transportation distances (7,7%).

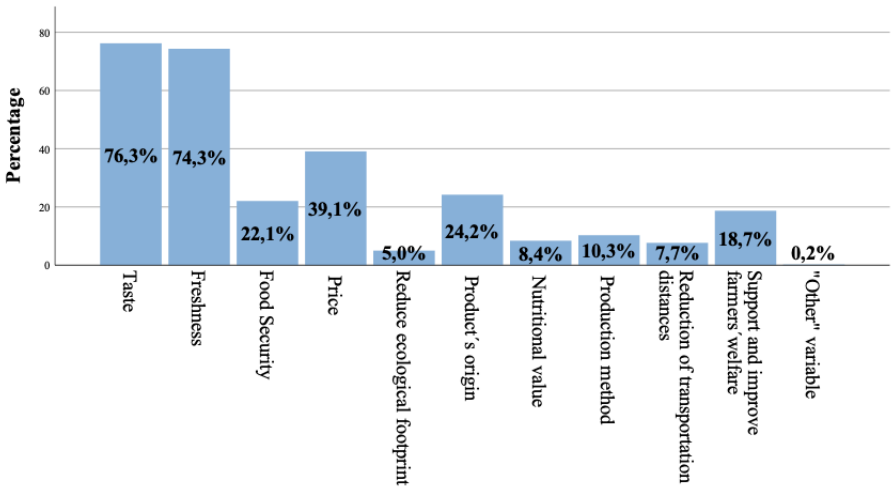


Figure 4.16 – Attributes of local food products most valued by Portuguese consumers

Elaborated by the author based on questionnaire´s answers

As earlier on the questionnaire consumers were asked about their opinion on local food products, it is crucial to really understand consumers´ definition of local products. The results showed that the majority respondents (69,9%) defined as products produced and manufactured in their region, 16,4% in Portugal and 13,8% within a 40-100km.

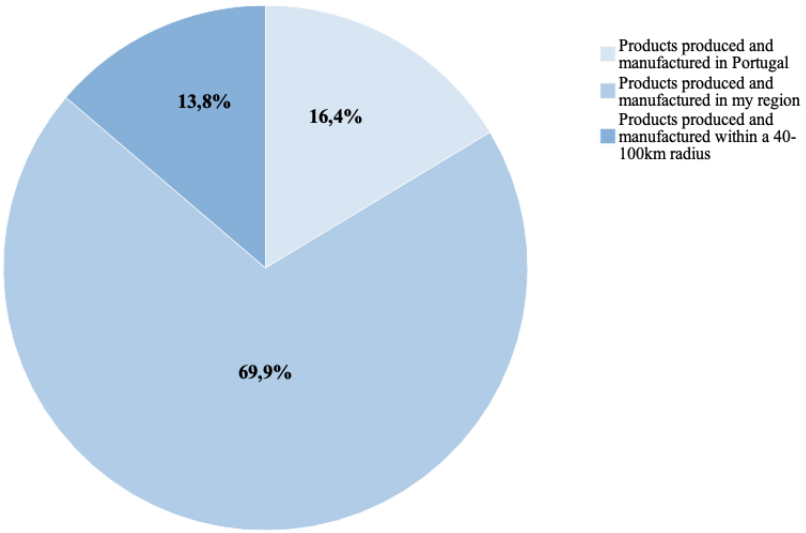


Figure 4.16 – Definition of local products for Portuguese consumers

Elaborated by the author based on questionnaire´s answers

Finally, the last question of the questionnaire regards the percentage of how much more are respondents willing to pay for local food products compared to products that travel long distances. Based on the valid sample (N=392), the 5% trimmed mean (i.e, calculate the mean of 90% of observations excluding the 5% sorted lowest values and the 5% sorted highest values) is 23,75%. This measure is extremely useful as 34 respondents have indicated that they were willing to pay 65% or more for local products which are considered outliers.

Analyzing Figure 4.17, the groups with more records are 10%-19% with 113 answers, 20%-29% with 82 respondents and 0-9% with 64 respondents so, most answers are concentrated in lower values. This is accordance with the skewness´ value of 1,522>0 that indicate values are concentrated on lower percentages (see Appendix J).

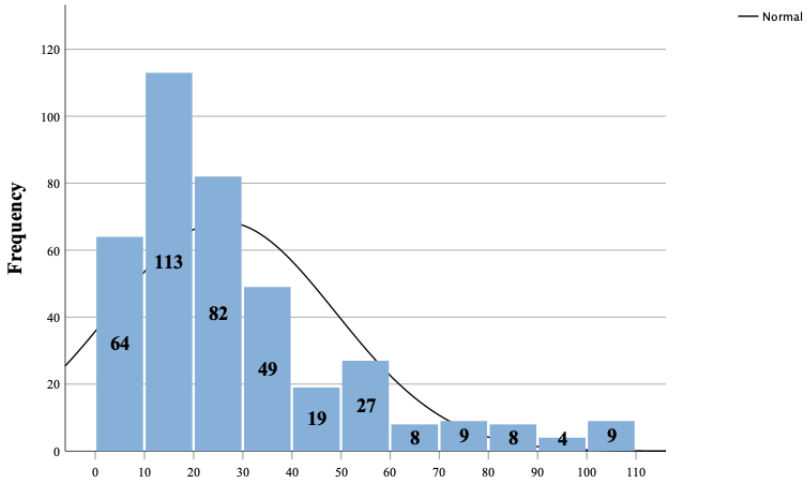


Figure 4.17 – Willingness to pay for local food products compared to products that travel long distances (in percentage)

Elaborated by the author based on questionnaire´s answers

4.3. Synthesis from data exploration

Perishable food products such as fresh fruits were observed to travel long distances until the final consumers. The registered producers and exporting countries for bananas, apples, oranges, kiwis, and pears were Brazil, Chile, Costa Rica, Ecuador, Ivory Coast, Netherlands, New Zealand, and South Africa. These origins of the products require long food miles and imply large CO_2 emissions for transportation of products.

Concerning the questionnaire, respondents were filtered based on their nationality and only Portuguese people were considered. The participants are predominantly females, people from the 40-49 years old and 20-29 years old segments, with bachelor's degree, with household income between 1001€ and 2000€, dependent workers, city inhabitants and from household constituted by 4 persons.

In respect to consumers´ perceptions and choices, the three most important factors when buying food products are price, taste, and food safety. Following these attributes, product origin also shows importance at the moment of purchase. However, environmental impact is almost irrelevant to most respondents.

Participants indicate to either frequently/regularly or sometimes check food products´ labels to see their origin. The frequency on buying these, for the majority of the sample, is on a once-a-week basis and predominantly made on supermarkets. On the other hand, only a small percentage mention to buy directly to producers.

Surveyed people mention to make a frequent/regular effort to find and buy fresh local food.

When focusing specifically on fresh fruits, the major concerns when buying are quality/freshness, price, and product´s origin. It is important to emphasize that transportation distances as well as ecological footprint are the least concerns.

Regarding the level of agreement for the statements presented, consumers agree that local food products allow to reduce transportation distances and farmers´ welfare is supported and improved when buying these. Contrarily, there is indifference about ecological footprint (CO_2 emissions) when buying fresh fruits. Local food products are considered more expensive, tastier, fresher and unharmful to the environment compared to conventional food products.

Portuguese consumers value taste, freshness, and price as key attributes of local food products. The ability to reduce transportation distances and ecological footprint are the least valued characteristics.

When asking about the definition of local products, most of Portuguese consumers indicate as products produced and manufactured in their region.

Finally, regarding the willingness to pay for local food products compared to products that travel long distances, people reveal to be willing to pay but the responses are concentrated in lower values. Only a small part of the sample is willing to pay twice as much.

CHAPTER 5

Conclusions, Limitations and Recommendations

5.1. Conclusions

Globalization has led to long and complex supply chains which results in products travelling longer distances and generating a high quantity of CO_2 emissions. Local food products are seen as an alternative that will improve this situation and promote environmental sustainability. Hence, it is important to understand consumers´ perspectives toward these products and their WTP price premiums in exchange of reducing their carbon footprint.

Previously, research questions were presented and the answer to each question is detailed in this chapter together with the respective discussion according to the literature review gathered. It is important to emphasize that during data analysis, different techniques were tested, such as correlations and regression trees however, the obtained results do not allow valid evidence on the issues raised. For this reason, the analysis will be based on the crosstabs obtained.

Considering the "RQ1: To what extend do consumers think about products´ origin and their travel distances when purchasing food products?", based on the research, the three characteristics more important to Portuguese consumers when purchasing food products are price, taste, and food safety. This is in line with the previous studies of Arli et al. (2016) and Szegedyné Fricz (2020) who identified safety, taste, naturalness, and quality as the factors with greatest impact on consumers´ food buying criteria.

For food products the origin is still an important factor after those mentioned. In general, people check food labels to see their origin in a regularly or occasionally basis and make, frequently, an effort to find and buy fresh local food products. Particularly for fresh fruits under study (i.e., apples, kiwis, oranges, and pears), consumers agree it is important to know where these were produced but in the moment of purchase it is not the primary concern. Quality/freshness and price are more appreciated. With a deeper analysis it is possible to perceive that the Portuguese food buyers more interested in where fresh fruits were produced are females, people in the age groups between 40 and 59 years old, individuals that belong to higher income groups, with higher education and that live in the cities.

Concerning the environmental impact, this is the least important factor when buying food products. For fresh fruits, Portuguese consumers predominantly do not consider transportation distances and ecological footprint as the three most important concerns when purchasing these

products. Even though, food buyers acknowledge that local food products will allow to reduce transportation distances and have less environmental impact, when they are buying fresh fruits, they do not think about the distances traveled and the CO_2 emissions generated in the moment of purchase.

For "RQ2: To what extend are consumers willing to pay more for locally grown products?", the current study has found that Portuguese consumers are willing to pay more for local food products compared to products that travel long distances. In this case, the average percentage of how much more buyers were WTP is considerably lower than the findings from Adams and Adams (2011). Only a small percentage of consumers have indicated to pay high price premiums for these types of products.

Contrarily to previous research, in the sample collected there are no strong associations between WTP and demographic factors. Despite this, conclusions can be drawn, the willingness to pay for products that travel shorter distances both for males and females are concentrated on lower levels. This shows that the majority is willing to pay up to 30% more compared to products that travel long distances. In the higher values of WTP, women are the most represented gender and are willing to pay more.

Although there is no evidence for strong association. As age increases, WTP more tend to decrease. The highest percentages of WTP are in lower age groups, namely between 20 to 29 and 40 to 49 years old. Additionally, considering household income groups, people who are WTP more 70% are those from higher segments and contrary, those in the lowest are who would pay lower percentages.

In terms of the level of education, higher education groups would be the ones to pay higher percentages. In contrast, individuals with 2nd and 3rd cycle are less willing to pay more for products under study. Another finding of this analysis is that, in all living locations – rural area, cities, and suburbs – a preponderant part of consumers is willing to pay up to 50% more for local products, compared to products that travel long distances.

To answer "RQ3: What are the attributes consumers value the most in locally grown products?", it is essential to understand how Portuguese consumers define local food products. In this case, the majority have said these are products produced and manufactured in their region. Nonetheless, opinions were divided between products produced and manufactured in Portugal and products within a 40-100km radius. Congruent with these findings is previous research from Brown (2003) who observed that a considerable part of southeast Missouri consumers defined local products as products produced within the region of study. The same investigation also pointed that other respondents defined as produced in a nearby region, on

their county, on their county and on an adjacent one and others to the entire state of Missouri. Therefore, the findings of the present research also stress how ambiguous the definition of local is.

During this study consumers compared local products to conventional products in terms of freshness, tastiness, price, and their impact on farmers´ welfare and on environment. Regarding freshness and tastiness, consumers have agreed that local food products are fresher and tastier than conventional products, which is in line with the study from Chambers et al. (2007). As buyers consider price as a decisive factor, this will influence their perceptions of local food products and, consequently, if they buy or not. In this case, Portuguese consumers agree that local food products are more expensive than conventional food products, which is congruent with the findings from British and Finnish consumers (Chambers et al. (2007); Roininen et al. (2006)).

Ethical reasons were included in the study. This allows to conclude that consumers agree that when buying local products this will foster not only the welfare of farmers but also the reduction of transportation distances. Also, they agree that these products have less environmental impact than conventional ones, which is in line with the study from Adams and Adams (2011). Despite that consumers agree with the statements, these are not the most valuable attributes of local food. Portuguese consumers refer taste, freshness, and price as the most important qualities, whereas the reduction of ecological footprint and transportation distances are considered less important where only 5% and 7,7% have chosen these options, respectively. Consumers value more the support and improvement in farmers´ welfare than the environmental benefits that buying local food products generate. These findings can be compared with the perceptions of Hungarian consumers who environmental friendliness aspects were less important than naturalness, deliciousness, nutritiousness, and safety (Fricz et al., 2020).

5.2. Limitations and Contributions

As seen previously, several studies aimed to explore the perceptions of consumers regarding local products. However, during the literature search, none seemed to study Portuguese consumers, their awareness in the products´ origin and whether they would be willing to pay more for products with lower transportation distances. Therefore, this research comes to not only fill this gap in the literature but also provides information about Portuguese consumers who recognize that it is important to know the origin of products, that local products allow

reducing transport distances and have less impact, but at the time of purchase this is not a strongly valued attribute. Besides this, we can see that despite being a low percentage, consumers are willing to pay more for products that travel shorter distances.

With deeper information about consumers, food systems can be managed in a better direction, allowing to reduce food miles (i.e., distance food travels between production stage until final consumer), carbon emissions in downstream stages of FSC and avoid jeopardizing the environment. In addition, it is important to highlight that there is a need for greater awareness among Portuguese consumer regarding the impact of transporting fresh food products on the environment.

Despite this better insight into Portuguese consumers´ impressions of locally grown food products, there are some limitations of this study.

Firstly, the sample obtained approximates to the Portuguese population, but some demographic factors can be over or underrepresented which implies a careful analysis of these data.

Secondly, although the collected data seems to be accurate and thorough, during data analysis different techniques (i.e., correlation techniques and regression trees) that were thought from the beginning to be useful did not allow to make clear and relevant conclusions about the topic under study. Thereby, the author analyzed results based on crosstabs obtained.

Finally, it is important to keep in mind that these results are difficult to extrapolate due to this limitation of the data base.

5.3. Suggestions for future research

The present research has quantitative focus and investigates solely Portuguese consumers´ perspectives on the topic under study. In the future this questionnaire can be applied to other countries, different types of products and even more representative samples.

Furthermore, in future research it would be relevant to analyze other important stakeholders such as suppliers and governments. Extending the study to suppliers would give insightful information about their awareness of the impact on environment of the products supplied, the long-travelled distances and willingness to change their practices toward more environmentally friendly ones. By investigating governments, it would be possible to assess and define policies for food systems toward sustainability.

Since environmental sustainability is a hot topic and travel distances of products and their impact on environmental is not a common subject studied, any research in this field would be noteworthy.

5.4. Contributions to management

As more and more companies are preparing themselves towards sustainability and the reduction of CO_2 emissions, this research provides idea on consumer behaviors which may serve as guidance for the strategic orientation of companies´ investments.

Furthermore, as food systems are crucial in the economic context, companies that work in the production and distribution sectors must be aware of the impact that their supply chain activities have in the environment and prepare their competitive strategies in accordance with the required changes of sustainability.

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APPENDIX

APPENDIX A: Population and sample characterization

	Population	Sample
Gender		
Female	52,8%	58,8%
Male	47,2%	40,0%
Non-binary	-	
Age		
0-14	13,5%	-
15-19	5,3%	0,5%
20-24	5,4%	18,9%
25-29	5,3%	5,0%
30-34	5,5%	4,3%
35-39	6,4%	9,1%
40-44	7,5%	13,7%
45-49	7,7%	17,5%
50-54	7,2%	12,9%
55-59	7,3%	7,7%
60-64	6,6%	5,5%
65-69	6,1%	3,6%
70-74	5,4%	0,5%
75 or more	10,9%	0,2%
Living Location		
Cities	73,4%	76,5%
Suburbs	14,3%	8,2%
Rural area	12,4%	15,3%
Occupation		
Student	6,8%	14,1%
Self-employed	6,4%	12,7%
Dependent worker	38,9%	64,3%
Retired	18,4%	6,0%
Unemployed	3,4%	2,4%
Education		
No qualification	4,3%	-
Primary school	16,9%	0,2%
2nd and 3rd cycle	24,5%	3,8%
High school and post-secundary education	20,6%	29,0%
Higher education	18,3%	66,2%

APPENDIX B: QUESTIONNAIRE

Questionnaire Local Food

Start of Block: Introduction

INTRODUCTION Olá! O meu nome é Joana Teixeira e sou estudante de mestrado do Iscte Business School.

O presente estudo tem como objetivo perceber as perceções dos consumidores relativamente ao impacto no ambiente do transporte de produtos frescos, especialmente, as frutas.

É esperado que este questionário demore cerca de 5 minutos a ser completado e a sua participação é completamente voluntária.

Este questionário é anónimo e os dados recolhidos serão mantidos estritamente confidenciais.

A sua experiência é extremamente importante para mim!
Se quiser completar este questionário, por favor clique no botão "Seguinte".

Muito obrigada!
Joana Teixeira

End of Block: Introduction

Start of Block: Demographic characteristics

Q1.1. Indique o seu género

- ○ Masculino (1)
- ○ Feminino (2)
- ○ Não binário (3)
- ○ Prefiro não dizer (4)

Q1.2. Indique a sua idade

- ○ 15 - 19 anos (1)
- ○ 20 - 24 anos (2)
- ○ 25 - 29 anos (3)
- ○ 30 - 34 anos (4)
- ○ 35 - 39 anos (5)
- ○ 40 - 44 anos (6)
- ○ 45 - 49 anos (7)
- ○ 50 - 54 anos (8)
- ○ 55 - 59 anos (9)
- ○ 60 - 64 anos (10)
- ○ 65 - 69 anos (11)
- ○ 70 - 74 anos (12)
- ○ 75 ou mais anos (13)
- ○ Prefiro não dizer (14)

Q1.3. Indique o seu nível de escolaridade obtido

- ○ 1º ciclo (1)
- ○ 2º ciclo (2)
- ○ 3º ciclo (3)
- ○ Ensino Secundário (4)
- ○ Licenciatura (5)
- ○ Mestrado (6)
- ○ Doutoramento (7)
- ○ Prefiro não dizer (8)

Q1.4. Indique a sua situação profissional

- ○ Estudante (1)
- ○ Trabalhador por conta própria (2)
- ○ Trabalhador por conta de outrem (3)
- ○ Desempregado (4)
- ○ Reformado (5)
- ○ Prefiro não dizer (6)

Q1.5. Indique o local onde habita

- ○ Zona rural (1)
- ○ Cidade (2)
- ○ Subúrbios (3)

Q1.6. Indique como é constituído o seu agregado familiar

- ○ 1 pessoa (1)
- ○ 2 pessoas (2)
- ○ 3 pessoas (3)
- ○ 4 pessoas (4)
- ○ 5 ou mais pessoas (5)

Q1.7. Qual é a sua nacionalidade?
Nacionalidade (7)

▼ Afegã (1) ... Zimbabuana (220)

Q1.8. Indique o valor do rendimento mensal do seu agregado familiar

- ○ Até 700€ (1)
- ○ De 701€ a 1000€ (2)
- ○ De 1001€ a 2000€ (3)
- ○ De 2001€ a 3000€ (4)
- ○ Mais de 3000€ (5)

End of Block: Demographic characteristics

Start of Block: Purchasing habits

Q2 Das características seguintes, escolha as três que considera mais importantes quando compra um produto alimentar?

- [ ] Sabor (1)
- [ ] Segurança Alimentar (2)
- [ ] Preço (3)
- [ ] Origem do Produto (4)
- [ ] Valor Nutricional (5)
- [ ] Aparência (6)
- [ ] Impacto no ambiente (7)
- [ ] Outro (indique por favor) (8) _____

Q3 Com que frequência verifica as etiquetas do produto para ver a sua origem?

- ○ Sempre (1)
- ○ Frequentemente/Regularmente (2)
- ○ Às vezes (3)
- ○ Nunca (4)
- ○ Não sei (5)

Q4 Com que frequência faz esforço para encontrar e comprar produtos frescos locais?

- ○ Sempre (1)
- ○ Frequentemente/Regularmente (2)
- ○ Às vezes (3)
- ○ Nunca (4)
- ○ Não sei (5)

Q5 Com que frequência compra produtos alimentares?

- ○ 1 vez por mês (1)
- ○ 1 vez por semana (2)
- ○ 2 vezes por semana (3)
- ○ 3 ou mais vezes por semana (4)

Q6 Indique onde compra a maioria dos seus produtos alimentares

- ○ Diretamente aos produtores (1)
- ○ Supermercados (2)
- ○ Hipermercados (3)
- ○ Mercearias (4)
- ○ Mercados locais (5)
- ○ Outro (indique por favor) (6) _____

End of Block: Purchasing habits

Start of Block: Fresh fruits

INTRODUCTION FRESH FRUITS **Considere agora apenas as frutas frescas, tais como maçãs, kiwis, laranjas e peras e responda às questões seguintes.**

Q7 Indique as suas três maiores preocupações quando compra estas frutas frescas

- ☐ Qualidade/Frescura (1)
- ☐ Preço (2)
- ☐ Como foi produzido (3)
- ☐ Valor Nutricional (4)
- ☐ Pegada Ecológica (5)
- ☐ Origem do produto (6)
- ☐ Distâncias de transporte (7)
- ☐ Outro (indique por favor) (8) _____

Q8 Relativamente às questões seguintes, por favor, escolha aquela que mais se adequa à sua situação.

	Discordo Totalmente (1)	Discordo (2)	Não concordo nem discordo (3)	Concordo (4)	Concordo totalmente (5)	Não sei / Não quero responder (6)
Quando compro frutas frescas tenho interesse onde foram produzidas. (a)	○	○	○	○	○	○
Quando compro frutas frescas penso na distância percorrida dos produtos. (b)	○	○	○	○	○	○
Quando compro frutas frescas penso na sua pegada ecológica (emissões de CO2). (c)	○	○	○	○	○	○
Acho importante saber onde é que as frutas frescas foram produzidas. (d)	○	○	○	○	○	○
Acho importante comprar produtos alimentares produzidos localmente. (e)	○	○	○	○	○	○

Os produtos alimentares locais são mais frescos que os produtos convencionais. (f)	○	○	○	○	○	○
Os produtos alimentares locais são mais caros que os produtos convencionais. (g)	○	○	○	○	○	○
A compra de produtos alimentares locais permite apoiar os agricultores e melhorar o seu bem-estar. (h)	○	○	○	○	○	○
Os produtos alimentares locais são mais saborosos que os produtos convencionais. (i)	○	○	○	○	○	○
Os produtos alimentares locais tem um menor impacto ambiental. (j)	○	○	○	○	○	○
Os produtos alimentares locais permitem reduzir as distâncias de transporte. (k)	○	○	○	○	○	○

Q9 Dos seguintes atributos, escolha os três que valoriza relativamente aos produtos alimentares locais?

- [ ] Sabor (1)
- [ ] Frescura (2)
- [ ] Segurança Alimentar (3)
- [ ] Preço (4)
- [ ] Redução da pegada ecológica (5)
- [ ] Origem do produto (6)
- [ ] Valor Nutricional (7)
- [ ] Método de produção (8)
- [ ] Redução das distâncias de transporte dos produtos (9)
- [ ] Apoiar e melhorar o bem-estar dos agricultores (10)
- [ ] Outro (indique por favor) (11) _____

Q10 O que entende por produtos alimentares locais?

- ○ Produtos cultivado e manufaturados em Portugal (1)
- ○ Produtos cultivado e manufaturados na minha região (2)
- ○ Produtos cultivado e manufaturados dentro de um raio de 40-100km (3)

Q11 Em percentagem, quanto estaria disposto a pagar a mais pelos produtos alimentares frescos de origem local face a produtos que percorrem grandes distâncias?

0 10 20 30 40 50 60 70 80 90 100

Percentagem ()	

End of Block: Fresh Fruits

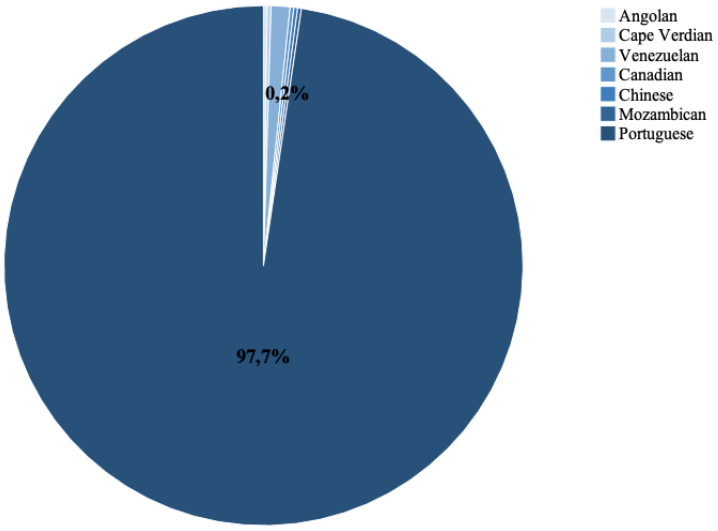
Start of Block: Email

EMAIL Caso pretenda conhecer os resultados da pesquisa, por favor, deixe o seu email.

_____

End of Block: Email

APPENDIX C: Nationalities of respondents



APPENDIX D: Responses suggested from respondents for the most important factors when buying food products

	Frequency	Percentage	Valid Percentage
Quality	4	1,0	1,0
Storage convenience	1	0,2	0,2
Total	417	100,0	100,0

APPENDIX E: Responses suggested from respondents for places where consumers most buy their food products

	Frequency	Percentage	Valid Percentage
Own cultivation	1	0,2	100
Total	417	100,0	100,0

APPENDIX F: Responses suggested from respondents for concerns when buying fresh fruits

	Frequency	Percentage	Valid Percentage
Appearance	3	0,7	0,7
Seasonal fruit or not	1	0,2	0,2
No pesticides	1	0,2	0,2
Taste	1	0,2	0,2
Total	417	100,0	100,0

APPENDIX G: Frequencies on "When I buy fresh fruit I think about its ecological footprint"

When I buy fresh fruit I think about its ecological footprint (CO2 Emissions)			
	Frequency	**Valid percentage**	**Cumulative percentage**
Totally Disagree	35	9,2	9,2
Disagree	75	19,7	28,9
Neither agree nor disagree	148	**38,8**	67,7
Agree	97	25,5	93,2
Totally agree	26	6,8	100,0
Total	381	100,0	

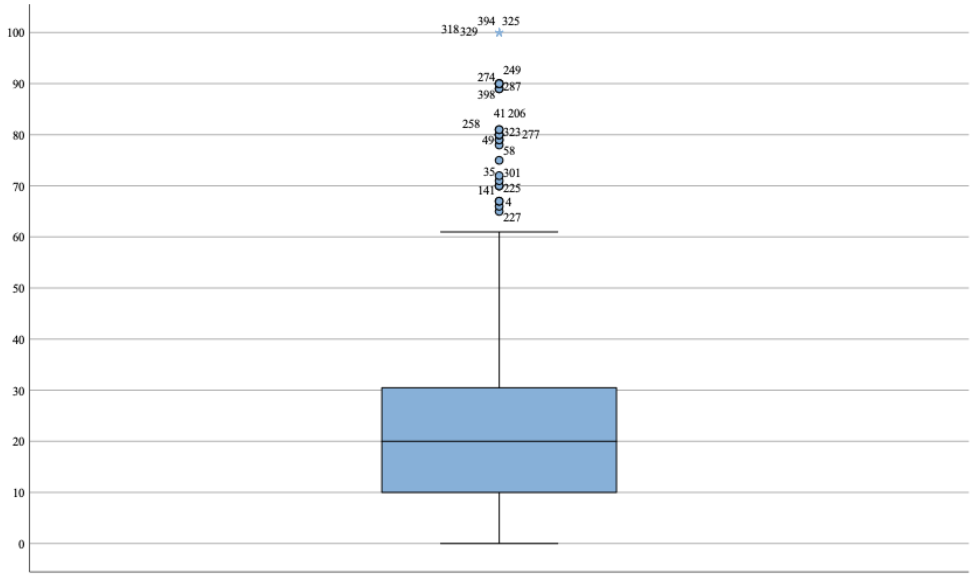
APPENDIX H: Frequencies on "local food products are more expensive than conventional products"

Local food products are more expensive than conventional products			
	Frequency	**Valid percentage**	**Cumulative percentage**
Totally Disagree	6	1,5	1,5
Disagree	36	9,2	10,8
Neither agree nor disagree	106	**27,2**	37,9
Agree	186	**47,7**	85,6
Totally agree	56	14,4	100,0
Total	390	100,0	

APPENDIX I: Frequencies on "When I buy fresh fruits I think about the distance the products travelled"

When I buy fresh fruit I think about the distance the products travelled			
	Frequency	**Valid percentage**	**Cumulative percentage**
Totally Disagree	30	7,7	7,7
Disagree	64	16,4	24,1
Neither agree nor disagree	122	**31,3**	55,4
Agree	122	**31,3**	86,7
Totally agree	52	13,3	100,0
Total	390	100,0	

APPENDIX J: Boxplot of the Percentage of how much would respondents be willing to pay for local food products compared to products that travel long distances



APPENDIX K: Statistics on the Percentage of how much would respondents be willing to pay for local food products compared to products that travel long distances

		Statistic
Percentage of how much would respondents be willing to pay for local food products compared to products that travel long distances	Mean	26,02
	5% Trimmed Mean	23,75
	Median	20,00
	Kurtosis	1,961
	Skewness	1,522

APPENDIX L: Interest in product´s origin by gender

When I buy fresh fruits, I am interested in where it was produced			
		Totally Agree	Agree
%	Females (N=231)	63,6%	53,2%
	Males (N=161)	36,4%	45,3%

APPENDIX M: Interest in product´s origin by age groups

When I buy fresh fruits, I am interested in where it was produced			
		Totally Agree (N=107)	Agree (N=191)
%	15-19 years old (N=1)	0%	0,5%
	20-29 years old (N=56)	15,9%	20,4%
	30-39 years old (N=45)	13,1%	16,2%
	40-49 years old (N=90)	26,2%	32,5%
	50-59 years old (N=71)	31,8%	19,4%
	60-69 years old (N=31)	12,1%	9,4%
	70 years old or more (N=3)	0,9%	1%

APPENDIX N: Interest in product´s origin by income groups

When I buy fresh fruits, I am interested in where it was produced			
		Totally Agree (N=107)	Agree (N=191)
%	Up to 700€ (N=5)	0%	2,6%
	From 700€ to 1000€ (N=39)	13,1%	11,5%
	From 1001€ to 2000€ (N=103)	31,8%	36,1%
	From 2001€ to 3000€ (N=78)	20,6%	29,3%
	More than 3000€ (N=76)	34,6%	20,4%

APPENDIX O: Interest in product´s origin by level of education

When I buy fresh fruits, I am interested in where it was produced			
		Totally Agree (N=107)	**Agree (N=191)**
%	**Primary School(N=1)**	0%	0,5%
	2nd Cycle(N=8)	1,9%	3,1%
	3rd Cycle(N=5)	1,9%	1,6%
	High School(N=75)	19,6%	28,3%
	Bachelor's degree(N=161)	58,9%	51,3%
	Master's degree (N=42)	14%	14,1%
	Doctorate Degree (N=5)	3,7%	0,5%

APPENDIX P: Interest in product´s origin by living location

When I buy fresh fruits, I am interested in where it was produced			
		Totally Agree (N=107)	**Agree (N=191)**
%	**Rural area (N=48)**	17,8%	15,2%
	Cities(N=224)	70,1%	78%
	Suburbs(N=26)	12,1%	6,8%

APPENDIX Q: Crosstab on WTP per Gender of respondents

			Gender				
			Male	**Female**	**Non-binary**	**Prefer not to say**	**Total**
%	**0-9%**	% em categorical WTP	34,4%	65,6%	0,0%	0,0%	100,0%
		% em Gender	**13,8%**	**18,6%**	0,0%	0,0%	16,4%
		% do Total	5,6%	10,8%	0,0%	0,0%	16,4%
	10-19%	% em categorical WTP	42,0%	56,1%	1,3%	0,6%	100,0%
		% em Gender	**41,5%**	**38,9%**	66,7%	50,0%	40,3%
		% do Total	16,9%	22,6%	0,5%	0,3%	40,3%
	20-29%	% em categorical WTP	43,7%	56,3%	0,0%	0,0%	100,0%
		% em Gender	**19,5%**	**17,7%**	0,0%	0,0%	18,2%
		% do Total	7,9%	10,3%	0,0%	0,0%	18,2%
	30-39%	% em categorical WTP	37,9%	58,6%	3,4%	0,0%	100,0%
		% em Gender	6,9%	7,5%	33,3%	0,0%	7,4%
		% do Total	2,8%	4,4%	0,3%	0,0%	7,4%
	40-49%	% em categorical WTP	59,1%	36,4%	0,0%	4,5%	100,0%
		% em Gender	8,2%	3,5%	0,0%	50,0%	5,6%
		% do Total	3,3%	2,1%	0,0%	0,3%	5,6%

	50-59%	% em categorical WTP	33,3%	66,7%	0,0%	0,0%	100,0%
		% em Gender	2,5%	3,5%	0,0%	0,0%	3,1%
		% do Total	1,0%	2,1%	0,0%	0,0%	3,1%
	60-69%	% em categorical WTP	62,5%	37,5%	0,0%	0,0%	100,0%
		% em Gender	3,1%	1,3%	0,0%	0,0%	2,1%
		% do Total	1,3%	0,8%	0,0%	0,0%	2,1%
	70-79%	% em categorical WTP	10,0%	**90,0%**	0,0%	0,0%	100,0%
		% em Gender	0,6%	4,0%	0,0%	0,0%	2,6%
		% do Total	0,3%	2,3%	0,0%	0,0%	2,6%
	80-89%	% em categorical WTP	37,5%	**62,5%**	0,0%	0,0%	100,0%
		% em Gender	1,9%	2,2%	0,0%	0,0%	2,1%
		% do Total	0,8%	1,3%	0,0%	0,0%	2,1%
	90-100	% em categorical WTP	33,3%	66,7%	0,0%	0,0%	100,0%
		% em Gender	1,9%	2,7%	0,0%	0,0%	2,3%

APPENDIX R: Crosstab on WTP per Age groups of respondents

			Age groups								**Total**
			15-19 years old	**20-29 years old**	**30-39 years old**	**40-49 years old**	**50-59 years old**	**60-69 years old**	**70 years old or**	**prefer not to say**	
%	**0-9%**	% em categorical WTP	0,0%	20,3%	12,5%	29,7%	31,3%	6,3%	0,0%	0,0%	100,0%
		% em Recoded age groups	0,0%	14,8%	15,7%	15,4%	23,3%	10,8%	0,0%	0,0%	16,3%
		% do Total	0,0%	3,3%	2,0%	4,8%	5,1%	1,0%	0,0%	0,0%	16,3%
	10-19 %	% em categorical WTP	0,0%	15,2%	15,2%	29,1%	24,1%	15,2%	1,3%	0,0%	100,0%
		% em Recoded age groups	0,0%	27,3%	47,1%	37,4%	**44,2%**	64,9%	66,7%	0,0%	40,3%

		% do Total	0,0 %	6,1 %	6,1 %	11,7 %	9,7 %	6,1 %	0,5 %	0,0 %	40,3 %
	20-29 %	% em categorical WTP	0,0 %	31,9 %	9,7 %	38,9 %	12,5 %	6,9 %	0,0 %	0,0 %	100,0%
		% em Recoded age groups	0,0 %	26,1 %	13,7%	22,8 %	10,5 %	13,5%	0,0 %	0,0 %	18,4 %
		% do Total	0,0 %	5,9 %	1,8 %	7,1 %	2,3 %	1,3 %	0,0 %	0,0 %	18,4 %
	30-39 %	% em categorical WTP	0,0 %	27,6 %	10,3%	27,6 %	24,1 %	3,4 %	3,4 %	3,4 %	100,0%
		% em Recoded age groups	0,0 %	9,1 %	5,9 %	6,5 %	8,1 %	2,7 %	33,3%	50,0%	7,4 %
		% do Total	0,0 %	2,0 %	0,8 %	2,0 %	1,8 %	0,3 %	0,3 %	0,3 %	7,4 %
	40-49 %	% em categorical WTP	0,0 %	22,7 %	13,6%	40,9 %	22,7 %	0,0 %	0,0 %	0,0 %	100,0%
		% em Recoded age groups	0,0 %	5,7 %	5,9 %	7,3 %	5,8 %	0,0 %	0,0 %	0,0 %	5,6 %
		% do Total	0,0 %	1,3 %	0,8 %	2,3 %	1,3 %	0,0 %	0,0 %	0,0 %	5,6 %
	50-59 %	% em categorical WTP	0,0 %	**33,3 %**	8,3 %	8,3 %	**33,3 %**	8,3 %	0,0 %	8,3 %	100,0%
		% em Recoded age groups	0,0 %	4,5 %	2,0 %	0,8 %	4,7 %	2,7 %	0,0 %	50,0%	3,1 %
		% do Total	0,0 %	1,0 %	0,3 %	0,3 %	1,0 %	0,3 %	0,0 %	0,3 %	3,1 %

	60-69 %	% em categorical WTP	12,5%	**50,0 %**	25,0%	12,5 %	0,0 %	0,0 %	0,0 %	0,0 %	100,0%
		% em Recoded age groups	50,0%	4,5 %	3,9 %	0,8 %	0,0 %	0,0 %	0,0 %	0,0 %	2,0 %
		% do Total	0,3 %	1,0 %	0,5 %	0,3 %	0,0 %	0,0 %	0,0 %	0,0 %	2,0 %
	70-79 %	% em categorical WTP	10,0%	**40,0 %**	20,0%	10,0 %	0,0 %	20,0%	0,0 %	0,0 %	100,0%
		% em Recoded age groups	50,0%	4,5 %	3,9 %	0,8 %	0,0 %	5,4 %	0,0 %	0,0 %	2,6 %
		% do Total	0,3 %	1,0 %	0,5 %	0,3 %	0,0 %	0,5 %	0,0 %	0,0 %	2,6 %
	80-89 %	% em categorical WTP	0,0 %	12,5 %	0,0 %	**75,0 %**	12,5 %	0,0 %	0,0 %	0,0 %	100,0%
		% em Recoded age groups	0,0 %	1,1 %	0,0 %	4,9 %	1,2 %	0,0 %	0,0 %	0,0 %	2,0 %
		% do Total	0,0 %	0,3 %	0,0 %	1,5 %	0,3 %	0,0 %	0,0 %	0,0 %	2,0 %
	90-100 %	% em categorical WTP	0,0 %	22,2 %	11,1%	**44,4 %**	22,2 %	0,0 %	0,0 %	0,0 %	100,0%
		% em Recoded age groups	0,0 %	2,3 %	2,0 %	3,3 %	2,3 %	0,0 %	0,0 %	0,0 %	2,3 %
		% do Total	0,0 %	0,5 %	0,3 %	1,0 %	0,5 %	0,0 %	0,0 %	0,0 %	2,3 %

APPENDIX S: Crosstab WTP per Household income per month

			Household income per month					**Total**
			Up to 700€	**From 701€ to 1000€**	**From 1001€ to 2000€**	**From 2001€ to 3000€**	**More than 3000€**	
%	**0-9%**	Contagem	2	7	23	15	17	64
		% em categorical WTP	3,1%	10,9%	35,9%	23,4%	26,6%	100,0%
		% em Household income per month	**22,2%**	14,0%	17,0%	15,3%	17,0%	16,3%
		% do Total	0,5%	1,8%	5,9%	3,8%	4,3%	16,3%
	10-19%	Contagem	4	17	51	47	39	158
		% em categorical WTP	2,5%	10,8%	32,3%	29,7%	24,7%	100,0%
		% em Household income per month	**44,4%**	34,0%	37,8%	48,0%	39,0%	40,3%
		% do Total	1,0%	4,3%	13,0%	12,0%	9,9%	40,3%
	20-29%	Contagem	1	12	23	14	22	72
		% em categorical WTP	1,4%	16,7%	31,9%	19,4%	30,6%	100,0%
		% em Household income per month	**11,1%**	24,0%	17,0%	14,3%	22,0%	18,4%
		% do Total	0,3%	3,1%	5,9%	3,6%	5,6%	18,4%
	30-39%	Contagem	0	2	13	5	9	29
		% em categorical WTP	0,0%	6,9%	44,8%	17,2%	31,0%	100,0%
		% em Household	0,0%	4,0%	9,6%	5,1%	9,0%	7,4%

		income per month						
		% do Total	0,0%	0,5%	3,3%	1,3%	2,3%	7,4%
	40-49%	Contagem	0	3	10	4	5	22
		% em categorical WTP	0,0%	13,6%	45,5%	18,2%	22,7%	100,0%
		% em Household income per month	0,0%	6,0%	7,4%	4,1%	5,0%	5,6%
		% do Total	0,0%	0,8%	2,6%	1,0%	1,3%	5,6%
	50-59%	Contagem	1	4	3	0	4	12
		% em categorical WTP	8,3%	33,3%	25,0%	0,0%	33,3%	100,0%
		% em Household income per month	11,1%	8,0%	2,2%	0,0%	4,0%	3,1%
		% do Total	0,3%	1,0%	0,8%	0,0%	1,0%	3,1%
	60-69%	Contagem	0	0	6	2	0	8
		% em categorical WTP	0,0%	0,0%	75,0%	25,0%	0,0%	100,0%
		% em Household income per month	0,0%	0,0%	4,4%	2,0%	0,0%	2,0%
		% do Total	0,0%	0,0%	1,5%	0,5%	0,0%	2,0%
	70-79%	Contagem	0	3	3	4	0	10
		% em categorical WTP	0,0%	30,0%	**30,0%**	**40,0%**	0,0%	100,0%
		% em Household income per month	0,0%	6,0%	2,2%	4,1%	0,0%	2,6%

		% do Total	0,0%	0,8%	0,8%	1,0%	0,0%	2,6%
	80-89%	Contagem	1	1	1	3	2	8
		% em categorical WTP	12,5%	12,5%	12,5%	**37,5%**	**25,0%**	100,0%
		% em Household income per month	11,1%	2,0%	0,7%	3,1%	2,0%	2,0%
		% do Total	0,3%	0,3%	0,3%	0,8%	0,5%	2,0%
	90-100%	Contagem	0	1	2	4	2	9
		% em categorical WTP	0,0%	11,1%	**22,2%**	**44,4%**	**22,2%**	100,0%
		% em Household income per month	0,0%	2,0%	1,5%	4,1%	2,0%	2,3%
		% do Total	0,0%	0,3%	0,5%	1,0%	0,5%	2,3%

APPENDIX T: Crosstab WTP per Level of education

			Level of education								**Total**
			Primary School	**2nd cycle**	**3rd cycle**	**High School**	**Bachelor Degree**	**Master Degree**	**Doctorate Degree**	**Prefer not to say**	
%	**0-9%**	**% em categorical WTP**	0,0%	3,1%	0,0%	31,3%	53,1%	9,4%	3,1%	0,0%	100,0%
		% em Level of education	0,0%	25,0%	0,0%	17,7%	16,6%	**12,0%**	**33,3%**	0,0%	16,3%
		% do Total	0,0%	0,5%	0,0%	5,1%	8,7%	1,5%	0,5%	0,0%	16,3%
		% em catego	0,0%	2,5%	2,5%	29,7%	50,6%	13,3%	1,3%	0,0%	100,0%

		rical WTP									
	10-19 %	**% em Level of education**	0,0 %	50, 0%	66, 7%	41, 6%	**39, 0%**	**42, 0%**	**33, 3%**	0,0 %	40,3 %
		% do Total	0,0 %	1,0 %	1,0 %	12, 0%	20, 4%	5,4 %	0,5 %	0,0 %	40,3 %
	20-29 %	**% em categorical WTP**	0,0 %	0,0 %	0,0 %	20, 8%	58, 3%	15, 3%	2,8 %	2,8 %	100, 0%
		% em Level of education	0,0 %	0,0 %	0,0 %	13, 3%	20, 5%	**22, 0%**	**33, 3%**	66, 7%	18,4 %
		% do Total	0,0 %	0,0 %	0,0 %	3,8 %	10, 7%	2,8 %	0,5 %	0,5 %	18,4 %
	30-39 %	**% em categorical WTP**	3,4 %	3,4 %	0,0 %	24, 1%	51, 7%	17, 2%	0,0 %	0,0 %	100, 0%
		% em Level of education	100, 0%	12, 5%	0,0 %	6,2 %	7,3 %	10, 0%	0,0 %	0,0 %	7,4 %
		% do Total	0,3 %	0,3 %	0,0 %	1,8 %	3,8 %	1,3 %	0,0 %	0,0 %	7,4 %
	40-49 %	**% em categorical WTP**	0,0 %	0,0 %	0,0 %	40, 9%	45, 5%	13, 6%	0,0 %	0,0 %	100, 0%
		% em Level of education	0,0 %	0,0 %	0,0 %	8,0 %	4,9 %	6,0 %	0,0 %	0,0 %	5,6 %
		% do Total	0,0 %	0,0 %	0,0 %	2,3 %	2,6 %	0,8 %	0,0 %	0,0 %	5,6 %

	50-59 %	**% em categorical WTP**	0,0 %	8,3 %	8,3 %	25,0%	41,7%	8,3 %	0,0 %	8,3 %	100,0%
		% em Level of education	0,0 %	12,5%	16,7%	2,7 %	2,4 %	2,0 %	0,0 %	33,3%	3,1 %
		% do Total	0,0 %	0,3 %	0,3 %	0,8 %	1,3 %	0,3 %	0,0 %	0,3 %	3,1 %
	60-69 %	**% em categorical WTP**	0,0 %	0,0 %	12,5%	25,0%	50,0%	12,5%	0,0 %	0,0 %	100,0%
		% em Level of education	0,0 %	0,0 %	16,7%	1,8 %	2,0 %	2,0 %	0,0 %	0,0 %	2,0 %
		% do Total	0,0 %	0,0 %	0,3 %	0,5 %	1,0 %	0,3 %	0,0 %	0,0 %	2,0 %
	70-79 %	**% em categorical WTP**	0,0 %	0,0 %	0,0 %	**30,0%**	**60,0%**	**10,0%**	0,0 %	0,0 %	100,0%
		% em Level of education	0,0 %	0,0 %	0,0 %	2,7 %	2,9 %	2,0 %	0,0 %	0,0 %	2,6 %
		% do Total	0,0 %	0,0 %	0,0 %	0,8 %	1,5 %	0,3 %	0,0 %	0,0 %	2,6 %
	80-89 %	**% em categorical WTP**	0,0 %	0,0 %	0,0 %	**37,5%**	**50,0%**	**12,5%**	0,0 %	0,0 %	100,0%
		% em Level of education	0,0 %	0,0 %	0,0 %	2,7 %	2,0 %	2,0 %	0,0 %	0,0 %	2,0 %

		% do Total	0,0 %	0,0 %	0,0 %	0,8 %	1,0 %	0,3 %	0,0 %	0,0 %	2,0 %
	90-100 %	**% em categorical WTP**	0,0 %	0,0 %	0,0 %	**44,4%**	**55,6%**	0,0 %	0,0 %	0,0 %	100,0%
		% em Level of education	0,0 %	0,0 %	0,0 %	3,5 %	2,4 %	0,0 %	0,0 %	0,0 %	2,3 %
		% do Total	0,0 %	0,0 %	0,0 %	1,0 %	1,3 %	0,0 %	0,0 %	0,0 %	2,3 %

APPENDIX U: Crosstab WTP per Living Location

			Living Location			**Total**
			Rural area	**Cities**	**Suburbs**	
%	**0-9%**	**Contagem**	9	50	5	64
		% em categorical WTP	14,1%	78,1%	7,8%	100,0%
		% em Living Location	**14,5%**	**16,8%**	**15,6%**	16,3%
		% do Total	2,3%	12,8%	1,3%	16,3%
	10-19%	**Contagem**	24	119	15	158
		% em categorical WTP	15,2%	75,3%	9,5%	100,0%
		% em Living Location	**38,7%**	**39,9%**	**46,9%**	40,3%
		% do Total	6,1%	30,4%	3,8%	40,3%
	20-29%	**Contagem**	12	54	6	72
		% em categorical WTP	**16,7%**	75,0%	8,3%	100,0%
		% em Living Location	**19,4%**	**18,1%**	**18,8%**	18,4%
		% do Total	3,1%	13,8%	1,5%	18,4%
	30-39%	**Contagem**	5	23	1	29
		% em categorical WTP	17,2%	79,3%	3,4%	100,0%
		% em Living Location	**8,1%**	**7,7%**	**3,1%**	7,4%

		% do Total	1,3%	5,9%	0,3%	7,4%
	40-49%	**Contagem**	3	15	4	22
		% em categorical WTP	13,6%	68,2%	18,2%	100,0%
		% em Living Location	4,8%	5,0%	12,5%	5,6%
		% do Total	0,8%	3,8%	1,0%	5,6%
	50-59%	**Contagem**	2	10	0	12
		% em categorical WTP	16,7%	83,3%	0,0%	100,0%
		% em Living Location	3,2%	3,4%	0,0%	3,1%
		% do Total	0,5%	2,6%	0,0%	3,1%
	60-69%	**Contagem**	1	7	0	8
		% em categorical WTP	12,5%	87,5%	0,0%	100,0%
		% em Living Location	1,6%	2,3%	0,0%	2,0%
		% do Total	0,3%	1,8%	0,0%	2,0%
	70-79%	**Contagem**	3	6	1	10
		% em categorical WTP	30,0%	60,0%	10,0%	100,0%
		% em Living Location	4,8%	2,0%	3,1%	2,6%
		% do Total	0,8%	1,5%	0,3%	2,6%
	80-89%	**Contagem**	1	7	0	8
		% em categorical WTP	**12,5%**	**87,5%**	0,0%	100,0%
		% em Living Location	1,6%	2,3%	0,0%	2,0%
		% do Total	0,3%	1,8%	0,0%	2,0%
	90-100%	**Contagem**	2	7	0	9
		% em categorical WTP	**22,2%**	**77,8%**	0,0%	100,0%
		% em Living Location	3,2%	2,3%	0,0%	2,3%
		% do Total	0,5%	1,8%	0,0%	2,3%