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**Farms in a box:  
How a new e-commerce solution is  
disrupting the purchasing of fresh  
produce online**

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## Abstract

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Box scheme is a service where consumers order fresh fruits and vegetables boxes online and that is delivered directly by producers. This service has emerged as a rapidly growing alternative to conventional grocery deliver systems.

However, consumers are not attracted to buy fresh fruits and vegetables online, due to the variable quality and sensory nature of this category. Thus, this study aims to identify the factors that influence consumers' willingness to purchase fresh fruits and/or vegetables box by e-commerce and to identify which box's characteristics contributes to the overall customers' satisfaction leading to repurchase intentions. These factors depend entirely on the online environment and not on the sensory experience of the product itself.

Therefore, through an online questionnaire, a sample of 284 participants was collected and used to analyze the results, using confirmatory factor analysis and multiple linear regressions.

The results obtained revealed that perceived quality, perceived healthiness, perceived convenience and information availability positively affect consumers' willingness to purchase the boxes online. Hence, when consumers are willing to order a box online they create expectations for a desire outcome influencing their overall satisfaction with it. In addition, the degree of overall customers' satisfaction, which has a positive impact on their repurchase intentions, is affected by the level of satisfaction with certain box characteristics, such as flexibility of box composition, freshness of the products and service precision.

## Resumo

Os cabazes de frutas e legumes frescos são encomendados *online* pelo consumidor e são entregues diretamente pelos produtores. Este serviço apareceu como uma alternativa em rápida expansão aos convencionais sistemas de entrega dos supermercados.

Contudo, a compra de frutas e legumes frescos *online* não atrai os consumidores, devido à qualidade variável e à natureza sensorial desta categoria. Assim, o objetivo deste estudo é identificar os fatores que influenciam a disposição dos consumidores de comprar um cabaz de frutas e/ou legumes frescos através do comércio eletrônico e identificar as características do cabaz que contribuem para a satisfação geral dos clientes, levando a intenções de recompra. Esses fatores dependem inteiramente do ambiente *online* e não da experiência sensorial do próprio produto.

Assim, através de um questionário *online* foi recolhida uma amostra de 284 participantes que foi usada para a análise dos resultados, feita através de análise fatorial confirmatória e regressões lineares múltiplas.

Os resultados obtidos revelaram que a qualidade percebida, saúde percebida, conveniência percebida e disponibilidade de informação afetam positivamente a disposição dos consumidores de comprar os cabazes *online*. Consequentemente, os consumidores estando dispostos a encomendar um cabaz *online* criam expectativas do resultado desejado influenciando a sua satisfação geral com o mesmo. Além disso, o grau de satisfação geral dos clientes, que tem um impacto positivo nas intenções de recompra dos mesmos, é afetado pelo nível de satisfação com certas características do cabaz, tais como a flexibilidade da composição do cabaz, a frescura dos produtos e a precisão do serviço.

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## Chapter 1. Introduction

Nowadays, farmers are more educated and informed and, thereby, they can easily take advantage of new technologies. Besides, modern farmers are characterized by being foremost entrepreneurs (Dohm, 2005). Indeed, in Portugal, during the last years, it has been observed a revolution, expansion and modernization of the agricultural sector (Koehler, 2017). In fact, the turnover in this sector increased by 3% in 2015 and mainly due to the internal market (Banco de Portugal, 2016). Additionally, the number of companies operating in the agricultural sector grew by 3.7% in 2015 compared to the previous year (Banco de Portugal, 2016).

Hence, a new sector was built by "a bunch of belligerent, value-driven farmers" (Chittock, 2013), designated by fresh fruits and vegetables box schemes which appeared as a rapidly growing alternative to conventional and centralized grocery deliver systems (Bosona, Gebresenbet, Nordmark, & Ljungberg, 2011). This innovative service enables consumers to deal directly with the producers in the supply chain and has becoming more and more popular (Brown, Dury, & Holdsworth, 2009).

Fruit and vegetables box scheme is a service that sells online baskets with fresh fruit and vegetables directly from the farmers to consumers' houses and it allows consumers to make local, and, in some cases, organic grocery choices (Brown et al., 2009).

On the one hand, the main purpose of this business is to link the consumers with farmers and highlight the quality of their local fresh goods. Hence, the proximity between consumers and farmers, which is generated by this service, helps producers to better understand consumer needs and, consequently, to better manage their lands and flow efficiently their productions (Uncovská & Ulcák, 2015). Also, it may increase consumer interest for local agriculture and its issues, as well as, increase consumers' awareness for the importance of choosing national products. Although, a recent study developed by Nielsen (2016) verified that fruits and vegetables are the main categories in which Portuguese consumers show a greater tendency to opt for national products. Additionally, there is a constant concern in Portugal to lead the population to consume national products. Consequently, nowadays, there is an increase in the number of initiatives in Portugal to promote the consumption of national products, such as "Portugal Sou Eu". The main purpose is to sensitize the Portuguese population to the social and economic importance of national products' consumption, since the production contributes to job creation, to boost the domestic market and the equilibrium of the balance of payments (Portugal Sou Eu, n.d.).

On the other hand, this business also aims to provide an online way of healthy eating to consumers, due to the healthy properties of fruits and vegetables (Slavin & Lloyd, 2012) and, in the majority of the cases, due to the chemical-free productions. Therefore, box schemes are becoming an alternative to conventional grocery deliver systems (Bosona et al., 2011).

Consumers have been switching in-store grocery shopping for the convenience of home deliveries ordered online (Chittock, 2013). They recognize online grocery shopping as an innovation that provides an alternative way to purchase grocery (Hansen, 2005), as well as deliver a different experience compared to in-store shopping (Hansen, 2005; Morganosky & Cude, 2000).

In contrast, consumers are not attracted to buy fresh fruits and vegetables online since they are more uncertain about their quality (Ch, 2010; Degeratu, Rangaswamy & Wu, 2000; Degeratu, Rangaswamy & Wu, 2000; De Figueiredo, 2000; Grewal, Iyer, & Levy, 2004). Firstly, because these categories hardly deliver sensory input online and, therefore, consumers cannot easily perceive their quality through the web (Cho, 2010, 2011; Hansen, 2005). Secondly, fresh fruits and vegetables are products with a variable quality since each individual product is different from every other. In fact, consumers are not able to use their senses directly to examine and feel these products (De Figueiredo, 2000) to avoid uncertainty of their quality and freshness during their online decision making process. Indeed, most of Portuguese consumers prefer to buy fresh fruits and vegetables at the stores instead of buying them online (Nielsen, 2017).

Cho (2010) had deeply explored consumers' acceptance of buying perishable grocery products online, such as fruits and vegetables. Many other studies were conducted to explore different consumers' behavior and attitudes regarding online grocery shopping (e.g., Chu, Arce-Urriza, Cebollada-Calvo, & Chintagunta, 2010 ; Degeratu et al., 2000; Morganosky & Cude, 2000). However, few studies (e.g., Cicia & Giudice, 2010; Brown et al., 2009; Unvoská) were developed to understand consumers' shopping behaviors regarding buying fresh fruit and vegetables boxes online, which is an increasing innovative alternative for buying perishable grocery products online.

Hence, the general aim of this research is to identify which factors drive consumers to the acquisition, satisfaction and repurchase of fruit and vegetables box schemes. Firstly, this research attempts to understand which factors, related to online grocery shopping, drive consumers to buy fresh fruit and vegetables boxes by e-commerce, which is entirely dependent on the online environment and not on the sensory experiment of the product itself. Secondly, the purpose of this research is to find which box schemes' characteristics influence

customers' overall satisfaction leading to repurchase intentions. Specifically, the aim of this research is to answer the following research questions:

- What drive consumers to buy fresh fruit and vegetable boxes by e-commerce without the five senses stimulation?
- Which factors drive customer satisfaction with the box leading to repurchase intentions?

This dissertation consists of five chapters. The next section, Chapter 2, will be developed around the existent academic literature focused on consumers' online grocery shopping behavior as well as on sensory products, on box schemes' business model and, also, on customer satisfaction and their repurchase intentions in the online environment. Finally, the complete conceptual framework will be also provided in the end of this chapter. In Chapter 3, the research methodology for this study, including the plan of data analysis, will be presented. In Chapter 4, the results obtained from the data collected will be analyzed. Finally, in Chapter 5, it will be discussed relevant conclusions drawn from the findings of this study and it will be presented the limitations and guidelines for future research.

## **Chapter 2. Theoretical Framework and Hypothesis Development**

For this chapter it was used the existent academic literature on online grocery shopping behaviors and attitudes, as well as on sensory stimuli and products. Furthermore, it was used literature involving box schemes, as well as customers' satisfaction and their repurchase intention in the online environment.

The first part connects online grocery shopping with fresh fruit and vegetables boxes ordered online, highlighting the unacceptance of buying sensory products online. The second part will address online customers' satisfaction and their repurchase intentions in the online environment, relating them with box schemes.

In each part will be developed hypothesis for every variable generated and at the end of this chapter will be presented the complete conceptual framework.

### **2.1. Online Grocery Shopping**

Online grocery shopping, in general, consists in a store where consumers can purchase diverse grocery products online. Moreover, this service delivers a consumer order to his or her chosen address after choosing it at a supermarket. In general, consumers must pay a fee for this service. Additionally, consumer can also pick up the order at the store (Morganosky & Cude, 2000).

Nowadays, there are several online retailers focused on different product categories. De Figueiredo (2000) defends that consumers make their shopping decisions online based on product category and how easily product quality is perceived. Indeed, some categories, such as books and computer products, are more accepted by consumers in the online environment than others, such as home grocery delivery (Grewal et al., 2004; Cho, 2010; 2011). More specifically, perishable grocery goods, such as fresh fruits and vegetables, that hardly deliver sensory input to online shoppers (Cho, 2010, 2011; Hansen, 2005) and make more difficult to perceive the quality before buying them online (Cho, 2011; Degeratu et al. 2000). In fact, shoppers cannot see, touch and smell directly the products during the online decision-making process. Therefore, they are more uncertain about the quality of grocery products (Cho, 2010; Degeratu et al. 2000; De Figueiredo., 2000). Indeed, the majority of Portuguese consumers are not very supporters of online grocery shopping and they prefer to buy fresh products in physical stores (Nielson, 2016).

The fact that online grocery shopping service cannot deliver senses directly to consumers was pointed by Cho (2010) as a major limitation. The researcher defends that the success of the business depends on minimize this gap between online and in-store service.

### **2.1.1. Sensory products**

Consumer decision making process is strongly influenced by human senses (Moreira, Fortes, & Santiago, 2017) and consumers consider that sensory attributes of food are the most important factor in their selection process (Magnusson, Arvola, Hursti, Åberg, & Sjöden, 2003). Recent studies have been developed to understand how human senses strongly influence behaviors and consumer purchase decision (e.g., Hultén, 2011; Krishna, 2012; Moreira et al., 2017).

Sensory attributes of a product are those that are directly defined through human senses – touch, smell, taste, hearing and sight - before the purchase. Non-sensory characteristics are those that can be easily transmitted in words, such as nutritional information (Chu et al., 2010; Degeratu et al., 2000). Krishna (2012) found that product's smell, touch, vision and audition influence its taste. Thus, sometimes, sensory characteristics are crucial for consumers to make an online purchase decision (Chu et al., 2010), especially for sensory products with a variable quality, such as fresh fruits and vegetables that have many sensory attributes.

De Figueiredo (2000) mentions that consumers would prefer to see and touch the piece of fruit and vegetable that will be delivered to avoid uncertainty about their quality and freshness. However, they are not able to physically examine and feel sensory products before buying them online (Anckar, Walden, & Jelassi, 2002; Cho, 2010; De Figueiredo, 2000). Certainly, the product description posted on websites reduces this limitation (De Figueiredo, 2000). Nevertheless, it may be impossible to communicate some sensory attributes online (Degeratu et al., 2000). Therefore, consumers may resort to brand names or familiar brands when buying sensory products online to be more confident about their quality and health. Additionally, consumers can repeat brand purchases to reduce risks (Chu et al., 2010). However, De Figueiredo (2000), who defined these products as *“look-and-feel goods with variable quality”*, highlighted that, even if shoppers know the product and recognize the brand, they need to see and touch the individual product to feel it before the online purchase. This is mainly due the fact that each product individually is different from each other.

### **2.1.2. Fruit and vegetable box schemes**

Fruit and vegetable box scheme, although is a service based on selling products hardly dependent on their sensory characteristics through online environment, it has becoming more and more popular (Brown et al., 2009). This service appeared as an increasing alternative to conventional and centralized grocery deliver systems (Bosona et al., 2011). This is a business that delivers local fresh fruit and vegetables to customers' home or other convenient address (Brown et al., 2009; Cicia & Giudice, 2010). Moreover, in some of the businesses the products delivered are organic (Brown et al., 2009; Uncovská & Ulcák, 2015). Although "local" suggests somehow proximity, consumers also associate small scale, greenness and quality to it (Brown et al., 2009). Hence, nowadays, consumers' willingness to buy fruits and vegetables that are produced locally is increasing due to health reasons and better prices offered for high or equal quality products compared to conventional grocers (Thom & Conradie, 2012). In some box schemes the products are organic,

In general, Boxes are ordered online from local producers who directly deliver them to the customers (Brown et al., 2009; Cicia & Giudice, 2010; Uncovská & Ulcák, 2015). Furthermore, besides reusing the boxes, they have different sizes to meet distinctive consumers need.

Moreover, producers weekly select the fruits and vegetables that compose the box. Hence, they present the box composition to consumers by email as well as through the company's website (Brown et al., 2009; Cicia & Giudice, 2010; Uncovská & Ulcák, 2015).

The offer often varies from delivery to delivery because is dependent on product availability and seasonality (Brown et al., 2009; Uncovská & Ulcák, 2015). Additionally, some box schemes allow consumers to customize their boxes (Cicia & Giudice, 2010), but products' offering to change also depend on their seasonality and availability (Brown et al., 2009; Cicia & Giudice, 2010). The proximity with consumers help producers to better understand consumer needs and, thereby, to organize more effectively farm's landscape (Thom & Conradie, 2012; Uncovská & Ulcák, 2015).

Some boxes schemes, apart from fresh fruits and vegetables, also offer dairy local products, such as cheese and fresh butter, and may also include meat (Brown et al., 2009; Uncovská & Ulcák, 2015). However, for the purpose of this study, only fresh fruit and vegetables boxes have been considered.

Though in some cases consumers can ordered the box promptly until forty-eight hours before the delivery established by the producer, typically the boxes are sold in an online weekly or

fortnightly subscription, depending on consumers' preferences (Brown et al., 2009; Cicia & Giudice, 2010; Uncovská & Ulcák, 2015). This is mainly because producers need to plan the crops to meet their demand. However, the delivery of the boxes in terms of day and hours is typically done by zone and, thereby, it is previously established by the producer. In case the customer would not be available to receive the box in the fixed time, they need to make sure that the box can be delivered somewhere and that it is suitable to the producer. For these situations, some services offer alternative locals where consumers can pick their boxes (Quinta do Arneiro, 2009).

Due to the increasingly popularity of box schemes, the big retail chains have started to enter in the sector (Chittock, 2013). In these cases, the wholesaler works as a bridge between farmers and consumers and the main objective is to highlight the quality and freshness of producers' products (Marketeer, 2017). Indeed, some supermarkets in Portugal, such as *Continente*, have also begun to offer boxes of fresh vegetables and fruits (Marketeer, 2017).

### **2.1.3. Willingness to purchase fresh fruits and vegetables box online**

#### ***(i) Perceived quality***

Kacen, Hess, and Chiang (2013) found that costumers perceived better quality of food products and are more convinced on getting the right product offline than online. However, Hansen (2005) stated that consumers who prefer to buy online consider that this option offers quality products. Additionally, Cho (2010) found that how consumers, who had previous experiences, perceived product quality when buying sensory goods online influences their willingness to buy these products online.

Consumers' willingness to purchase groceries online can be influenced by their perception of products' performance risk (Cho, 2011; Hansen, 2005). Forsythe and Shi (2003) stated that a product performance risk is defined as "the loss incurred when a brand or product does not perform as expected". The researcher found that the uncertainty regarding product quality is one reason for consumers not to buy online. Indeed, consumers may be concerned about the delivery of the correct products by the retailers and the possibility of receiving groceries with low quality or faulty, especially perishable goods (Hansen, 2005; Morganosky & Cude, 2000). Consumers' uncertainty about the results of their online grocery purchase leads to a higher perceived online risk (Hansen, 2005).

Even though consumers know the brand and the product, they need to see and touch products, especially sensory goods with variable quality, such as fresh fruits and vegetables (Cho, 2010;

De Figueiredo, 2000). Therefore, consumers seem unlikely to buy these products online (Cho, 2010) because they have different preferences regarding the ripeness. (Anckar et al., 2002) Furthermore, they cannot perceive and ascertain the quality (Cho, 2011; Chu et al., 2010; Degeratu et al., 2000; Forsythe & Shi, 2003) before shopping groceries online due to some online barriers that limit consumers to touch and feel the products (Forsythe & Shi, 2003). Consequently, they may be disappointed when receiving their order (Cho, 2010). Owing to this, e-businesses, including online supermarkets, are concerned about minimizing consumers' uncertainties regarding the quality of products with sensory attributes purchased online (Cho, 2010). Indeed, how customers perceive the quality of the product online is very important for e-businesses due to the limitations on delivering enough information about sensory attributes and conveying quality through internet (Cho, 2010; Chu et al., 2010; De Figueiredo, 2000).

In contrast, consumers do not consider the quality of the production as a barrier to use the box scheme of fruits and vegetables (Brown et al., 2009). Indeed, consumers can obtain fresh fruits and vegetables at the optimal point of ripening when using box schemes (Cicia & Giudice, 2010; Uncovská & Ulcák, 2015) and they can be sure that they receive high quality products (Uncovská & Ulcák, 2015). Moreover, consumers associate the product produced locally to quality (Brown et al., 2009).

Researchers found that most consumers indicate the quality of the product, which includes taste and freshness, as the first motivation and most important factor for purchasing a fruit and vegetable box scheme (Bosona et al., 2011; Brown et al., 2009; Uncovská & Ulcák, 2015).

Considering the above literature review, the following hypothesis is presented:

*H1a: Perceived quality will positively affect consumers' willingness to purchase fresh vegetables and fruits boxes online.*

#### **(ii) Perceived healthiness**

Many consumers consider healthiness an important condition for their shopping (Magnusson et al., 2003). The more consumers concern with healthy eating, the more effort they put into choosing healthier products (Hollywood et al., 2013). Besides that, some consumers perceive healthy shopping as an obligation that do not give them pleasure while satisfying their needs since they feel that product's taste is affected when they opt for the healthiest option (Hollywood et al., 2013). Additionally, it is difficult for some consumers, who are responsible

for household shopping, to make healthy shopping because they want to satisfy the needs of others (Hollywood et al., 2013).

In general, consumers associate health in food to some product attributes: natural, without additives, fresh, low fat, unprocessed, nutritious, and fiber, vitamins and minerals content (Tudoran 2009). In their study, Hollywood et al. (2013) found that most of participants consider a grocery purchase as healthy when it includes fruits and/or vegetables, as well as, chilled and fresh products instead of frozen and processed foods. Tudoran, Olsen and Dopico (2009) even reinforces that “consumer interest in health is significantly associated with positive attitudes towards healthy foods such as fruit, vegetables, and fish.”

Fruits and vegetables are being, over the years, promoted globally as healthy and included in diet plans (Slavin & Lloyd, 2012), since their high consumption is associated with risk's reduction of contracting certain diseases (Sharps & Robinson, 2016; Slavin & Lloyd, 2012) due to their healthy properties (Salvin 2012). Indeed, fruits and vegetables are composed by dieter fiber, which consumption is related to decrease in the occurrence of cardiovascular diseases and obesity, as well as nutrients, phytochemicals, vitamins and minerals (Slavin & Lloyd, 2012).

Furthermore, healthiness is considered the main motivation for consumers to buy fresh fruit and vegetable boxes online (Brown et al., 2009; Uncovská & Ulcák, 2015). Also, Uncovská and Ulcák (2015) noted that box scheme usually offers organic fruits and vegetables that are linked to healthiness. Indeed, the main characteristic of organic food is being chemical-free, which may help to eliminate and prevent certain diseases (Magnusson et al., 2003; Uncovská & Ulcák, 2015), such as allergies and eczema (Uncovská & Ulcák, 2015).

The value that consumers give to health influences their behaviors (Tudoran et al., 2009), particularly their choices regarding food products. Indeed, consumers' decision making regarding food choice is influenced, among other factors, by their perception of product's healthiness which can be different among individuals (Davis, Haws, & Redden, 2016; Hollywood et al., 2013). Healthiness is a product relative attribute that leads to different perceptions by consumers (Davis et al., 2016). Although, health's concept regarding food is not always clear and depends frequently on comparisons among products and cues to deduce it (Davis et al., 2016), consumers have notions about which products should be included or excluded in a healthful diet when they buy groceries (Hollywood et al., 2013). Furthermore, how consumers perceive health and product's healthiness are important factors that influence their perceptions (Tudoran et al., 2009) and, sometimes, enough for consumers to make their product selections when buying their groceries (Hollywood et al., 2013).

Hence, the following hypothesis will be tested.

*H1b: Perceived healthiness will positively affect consumers' willingness to purchase fresh vegetables and fruits boxes schemes*

***(iii) Perceived convenience***

Consumers consider that they need extra time to do a healthful grocery shopping, mainly because they consider it an activity that requires more effort and monitoring among planning, shopping and cooking (Hollywood et al., 2013). Hence, this may be a problem and considered as a barrier for many consumers to shop healthy (Hollywood et al., 2013), including fresh fruits and vegetables purchases, since they seek to save time for their leisure activities (Parsons & Conroy, 2006). Therefore, when some consumers are under time pressure they are unlikely to choose healthy products, such as fresh fruits and vegetables, due to the convenience, impulsive and/or habitual of other shopping solutions (Hollywood et al., 2013). Indeed, Brown et al. (2009) found that consumers indicate convenience as a barrier to purchase “organic produced foods and local food purchased direct from farms”. However, costumers do not see convenience as a barrier to use fruit and vegetable box scheme (Brown et al., 2009).

Nevertheless, online shopping also brings many advantages to consumers, such as greater accessibility, convenience and time saving. For instance, consumers do not need to go to the store, to carry the bags, to have restriction on shopping hours (Chu et al., 2010) and to deal with crowds and queues (Anckar et al., 2002; Morganosky & Cude, 2000). Indeed, internet shopping growth and sustainability may be a result of consumers' need to save time for non-working activities (Parsons & Conroy, 2006).

Convenience, related to saving time, is the main driver for consumers to buy groceries online (Anckar et al., 2002; Cho, 2010; Hansen, 2005; Morganosky & Cude, 2000). Morganosky and Cude (2000) highlighted that the time that consumers consider saving more is the one regarding their trip to the store. Indeed, consumers must order fruits and vegetables boxes online what may make the service attractive to them (Thom & Conradie, 2012). However, some consumers do not indicate convenience as an important motivator to buy fruit and vegetable boxes online (Brown et al., 2009).

Following what has been presented, the following hypothesis will be tested:

*H1c: Perceived convenience will positively affect consumers' willingness to purchase fresh vegetables and fruits boxes online.*

#### *(iv) Perceived price*

Consumers' online behaviors are influenced for their price sensitivity (Cho, 2010), making price an important element online. Although consumers highly expect lower prices online and their selection depends on price and promotions, retailers do not always offer different prices between online and offline (Cho, 2010).

Consumers easily compare (Cho, 2010) and get more information (Degeratu et al., 2000) on prices online since they can effortlessly visit multiple websites that offer similar services and products (Cho, 2010). This increases their price sensitivity for undifferentiated products (Degeratu et al., 2000), i.e., that can be easily substituted by products from other suppliers. In contrast, Pozzi (2012) found that costumers explore products less online than offline when shopping groceries. Therefore, consumers are less price sensitive when shopping groceries online than in store due to a higher brand loyalty (Chu et al., 2010; Pozzi, 2012).

Cho (2010) found that retailers should develop strategies to meet consumers' expectations regarding the price of perishable products, such as fresh fruits and vegetables, due to their uncertainty and risk on buying these products online. In addition, De Figueiredo (2000) stated that consumers are willing to purchase fresh vegetables and fruits online, that he defined as "look-and-feel products with variable quality", if companies offer inexpensive repeat purchases.

Indeed, with repeated purchases retailers enhance their reputation online regarding the quality of fresh vegetables and fruits because consumers may be more sure about the quality of these products delivered by certain retailer (De Figueiredo, 2000) and may become loyal (Chu et al., 2010). For instance, a fruit and vegetable box scheme usually works by an online weekly or fortnightly subscription and, thereby, consumers receive regular deliveries of different fresh fruits and vegetables (Uncovská & Ulcák, 2015).

Moreover, inexpensive products relieve consumers of the risk of buying fresh vegetables and fruits online because they perceive that potential losses are lower. Therefore, consumers would be more able to experiment buying these products online and, thus, they build an opinion on retailers (De Figueiredo, 2000). In contrast, although price is considered a barrier for consumers to buy, not only fruits and vegetables organically produced (Brown et al., 2009; Hungner, 2007) but also local fruits and vegetables produce and purchased direct from farms (Brown et al., 2009), there are some signs that consumers are willing to pay more for these products (Brown et al., 2009; Hungner 2007; Thom & Conradie, 2012). This is mainly because consumers typically perceive healthy products as more expensive than the others (Hollywood et al. 2013). Additionally, consumers consider that box schemes offer fresh fruits

and vegetables with higher or equal quality at a cheaper price than conventional grocers. Therefore, their willingness to buy fruits and vegetables that are produce locally is higher (Thom & Conradie, 2012). However, Brown et al. (2009) noted that budget is not considered an important motivator to use box schemes and, part of consumers, considered that is always very expensive to use this system.

However, Kim, Xu, and Gupta (2012) noted that a high perceived price generates a monetary loss for consumers and, thereby, will probably dissuade consumers' willingness to purchase the product. Thus, the following hypothesis will be tested:

*H1d: Perceived price will negatively affect consumers' willingness to purchase fresh vegetables and fruits boxes online.*

#### **(v) Information availability**

Even though information availability influences consumer's online decision making (Cho, 2010), some relevant information regarding product's attributes may not be available online due to the impossibility of communicating it through the internet (Degeratu et al., 2000).

Hence, the acceptance of buying sensory products online is not as positive as the purchase of non-sensory products. This is mainly due to the limitations on delivering to consumers enough information about sensory attributes through the Internet (Cho, 2010; Chu et al., 2010). Additionally, there are more information available offline than online for categories with many sensory attributes (Degeratu et al., 2000), what makes the decision-making easier offline. Indeed, there are relevant offline search product attributes, as the physical appearance of fresh fruits and vegetables (Hansen, 2005), that would be impossible to examine (Chu et al., 2010; Forsythe & Shi, 2003) and get information about it (Degeratu et al., 2000; Forsythe & Shi, 2003) before the purchase online.

Cho (2010) found that the way in which consumers, who already had past experiences of buying perishable goods online, perceive information about buying these products online, influences the willingness to purchase them online, including fresh fruits and vegetables. However, search costs for obtaining information about sensory attributes may be higher online than offline. Thereby, the importance and impact of sensory attributes is lower online (Degeratu et al., 2000). The information will be more available if it is easier to search and it will consequently have a greater impact on product decision-making process (Degeratu et al., 2000). Indeed, when consumers search for online information, they focus on relevant available attributes (Cho, 2010; Degeratu et al., 2000).

Hence, if businesses are not able to deliver sensory inputs directly to consumers they put an extra effort into delivering information, in order to reduce their uncertainty (Cho, 2010). For instances, fruit and vegetable boxes schemes, in general, provide information online regarding the farm. The information includes the history, diversity of landscape and quality certificates, the producer and the products, such as origin and if they are organic or not, (Circia 2010). Moreover, some of these schemes try to deliver more detailed information, such as the explanation of the taste, for the fruits and vegetables that they offer and , also, information regarding the use of these products.

Considering the above literature review, the following hypothesis now arises:

*H1e: Availability of information will positively affect consumers' willingness to purchase fresh vegetables and fruits boxes online*

#### **(vi) Online interactivity**

Cho (2010) highlighted that consumers have the intent to use websites that provide quality content since this reduces their search efforts. Indeed, the quality of the website is an important factor for the purchase of sensory products with variable quality (Cho, 2004). According to Hansen (2005), consumers may be reluctant to purchase the aforementioned products online. This reluctance can be explained by the difficulty to evaluate them, as well as the too complexity to find relevant information about them.

Although sensory stimuli would probably not drive online shopping, Parsons and Conroy (2006) found that “stimulus is a part of the browsing experience” and that aural and visual stimulation, which is the dominant sense (Krishna, 2012), were the most applicable to the online environment. More specifically, the aural stimulation, through music as a background stimulus, and visual stimulation, through the visualization of products and presentation of the website, may be drivers for consumers to shop online. Although consumer is not physically in the store, his mind is in the store while he is buying online. Indeed, this allows and helps aural and visual sensory stimuli presented online to achieve the desired results (Parsons & Conroy, 2006).

The interactivity is a very important factor for consumers' loyalty in the online environment (Srinivasan, Anderson, & Ponnayolu, 2002). For that reason, online businesses attempt to reduce the differences regarding products attributes' physical aspect, particularly with sensory products, by increasing the interactivity through the Internet (Cho, 2010). This should be done

since, consumers use product attributes as a tool to perceive product quality and decide to purchase it (Cho, 2010; Degeratu et al., 2000; De Figueiredo, 2000).

Furthermore, there are limitations on delivering information about sensory products, especially perishable goods such as fresh vegetables and fruits that present a variable quality (Cho, 2011). Therefore, retailers need to increase customer trust by delivering information about relevant attributes of sensory products. This can be done using not only words, since product description posted on websites reduces this limitation (De Figueiredo, 2000), but also using pictures (Cho, 2010; Benn, Webb, Chang, & Reidy, 2015), given that consumers consider that is more difficult to select food products online without picture (Benn et al., 2015). This means that interactivity significantly increases the quantity of information that can be presented online to consumers (Srinivasan et al., 2002). Thus, online grocery stores need tools as pictures of the products that allow the consumer to enlarge and have more detailed and sophisticated information regarding the products that have variable quality. This also allows consumers to examine the products physically, such as fresh fruits and vegetables (Cho, 2004). For instance, some box schemes' websites more than providing information about the fruits and vegetables, they present pictures before being harvested from the farm (Quinta do Arneiro, 2009). This may help consumer to be surer about the quality of the products that will be delivered to them

Following what has been presented, the following hypothesis will be tested:

*H1f: Online interactivity will positively affect consumers' willingness to purchase fresh vegetables and fruits boxes online.*

## **2.2. Loyalty**

### **2.2.1. Customer satisfaction**

Consumers create expectations for a desired outcome when buying their groceries online (Cho, 2011). Indeed, online grocers increase consumers' product expectations through online interactivity, such as by the use of tools like pictures (Cho, 2010). Tudoran et al. (2009) defined expectations as "the experiences which consumers believe will result from using the product."

Consumers are likely to purchase a product that generates a higher level of expectation (Tudoran et al., 2009). In their study, Tudoran et al. (2009) divided food expectations into "sensory expectations" and "hedonic expectations".

The first one refers to the expectations on performance regarding product attributes, while the second one is about emotional expectations, such as interest and surprise. Furthermore, consumers may not repeat their purchase if their product's performance expectation is not met and/or if the product surprised them negatively (Hansen, 2006). The experiences resulted from using the product lead to consumers' satisfaction or dissatisfaction (Chen & Chang, 2003), which is the alternative side of satisfaction (Cho, 2011). In fact, consumer can obtain, or not, a pleasure state related to emotions, such as happiness, surprise or delight, with product's consumption (Mortimer, Fazal e Hasan, Andrews, & Martin, 2016).

Anderson and Srinivasan (2003) defined online satisfaction as "the contentment of the customer with respect to his or her prior purchasing experience with a given electronic commerce firm." In other words, consumers can be satisfied or dissatisfied after their online purchase (Chen & Chang, 2003). Additionally, Hansen (2006) related customer satisfaction to a specific online grocer or to a specific online purchase.

Furthermore, consumers are uncertain about the results of buying fresh fruits and vegetables online (Hansen, 2005; Mortimer et al., 2016) since those have a variable quality characteristic and they cannot examine them physically (Anckar et al., 2002; Cho, 2010; Degeratu et al., 2000; De Figueiredo, 2000). Therefore, consumers are not sure if the online purchase will reach their expectations and, consequently, if they will be satisfied (Cho, 2010).

Hence, the following hypothesis will be tested:

*H2: Consumer's willingness to purchase fresh fruits and vegetables box online will positively affect their overall satisfaction*

Consumers that buy fruits and vegetables boxes online primarily expect that products' attributes, such as flavor and freshness, that come in the box are more than satisfactory (Cicia & Giudice, 2010). During the experience of using the box, consumers' satisfaction, which is already pleased with the composition of the box, can increase with the quality of the products, as well as with the chosen service (Cicia & Giudice, 2010). Indeed, overall satisfaction with the box can be influenced by different several characteristics (Thom & Conradie, 2012).

Overall satisfaction regarding the purchase of online fruits and vegetables boxes will be investigated based on previous studies (Cicia & Giudice, 2010; Thom & Conradie, 2012). This will be done through the analysis of consumers' satisfaction with six specific box characteristics that were proved as being significant variables:

- (a) Flexibility of box's composition, with the products that customer wants.

- (b) Variety of the products offered in the box
- (c) Freshness of the products in the box
- (d) Flavor of the products in the box
- (e) Precision of box's service, in terms of delivering the exact products that customer ordered.
- (f) Flexibility of box's delivery, in terms of days and hours

Considering the above literature review, the following hypothesis now arises:

*H3a: Higher level of satisfaction with the flexibility of box's composition will lead to a higher degree of consumers' overall satisfaction with the box*

*H3b: Higher level of satisfaction with the variety of box's composition will lead to a higher degree of consumers' overall satisfaction with the box.*

*H3c: Higher level of satisfaction with the freshness of box's products will lead to a higher degree of consumers' overall satisfaction with the box.*

*H3d: Higher level of satisfaction with the flavor of box's products will lead to a higher degree of consumers' overall satisfaction with the box.*

*H3e: Higher level of satisfaction with the precision of box's service will lead to a higher degree of consumers' overall satisfaction with the box.*

*H3f: Higher level of satisfaction with the flexibility of box's delivery will lead to a higher degree of consumers' overall satisfaction with the box.*

### **2.2.2. Repurchase intentions**

Customers will trust more on online grocer if they are satisfied with their prior purchase and, consequently, they will be more likely to repurchase online (Mortimer et al., 2016). Indeed, satisfaction is one of the most important factors that drives consumer to repurchase (Mortimer et al., 2016) and it will very likely make consumer more loyal (Cho, 2011). Anderson and Srinivasan (2003) defines online loyalty as “the customer's favourable attitude toward an electronic business resulting in repeat buying behaviour”

Basically, if a product meets or exceeds consumers' expectations, they will be satisfied and it will consequently increase the trust on the grocer (Mortimer et al., 2016). Hence, this will

lead to an increasing of consumers repurchase intentions (Mortimer et al., 2016) and will drive them to be more loyal (Court, 2009).

Consumers will be more likely to purchase fruits and vegetables online if the frequency of their purchases increases (Mortimer et al., 2016), due to the decrease of their perceived risk of buying products with variable quality online (Hansen, 2005; Mortimer et al., 2016). In fact, frequent customers, who buy regularly (Reinartz & Kumar, 2002), have more experiences with the online grocer, developing high levels of satisfaction and, therefore, trusting more the retailer. Consequently, they may become more loyal to a grocery service online than infrequent customers (Mortimer et al., 2016). Additionally, customers can become active loyal and, thereby, be more involved with the company and recommend it (Court, 2009).

Furthermore, consumers order food products with variable quality online, such as fresh fruits and vegetables, because they trust on the grocer to select quality products. Therefore, if they experience continued satisfying results they are more likely to repurchase (Mortimer et al., 2016; Oliver, 1999).

Even though, in some businesses, the box is sold through an online subscription modality, consumers can easily unsubscribe it without costs and overnight. Thus, producers need to increase the probability of consumers to repurchase online fruits and vegetables boxes. This can be done by increasing customer trust on sensory products offered online (Cho, 2010). In fact, trust and satisfaction concepts are positively related (Mortimer et al., 2016), and, this ensures that costumers will be satisfied with the quality of the products delivered to them (Mortimer et al., 2016), since fruits and vegetables can deteriorate during the delivery process.

Considering the aforementioned literature review, the following hypothesis is presented:

*H4: Customer overall satisfaction will positively affect their intention of repurchase fresh vegetables and fruits boxes online*

### 2.3. Conceptual Framework

A complete conceptual model for this study alongside with the constructed hypothesizes was developed and presented in the figure below.

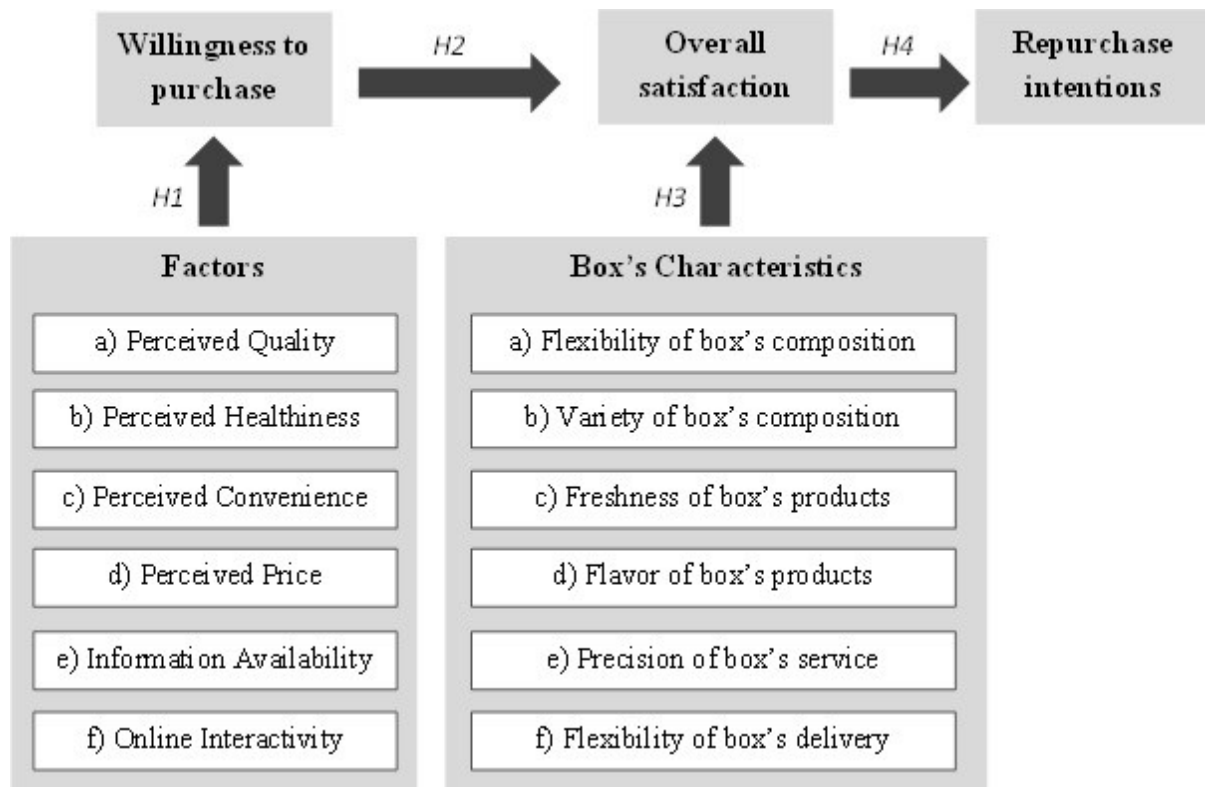


Figure1. Conceptual model

## Chapter 3. Methodology

In this chapter, the methodology will be described in detail. Firstly, the strategy used to conduct the research study will be explained. Then, the data collection and the study design will be described. Lastly, the plan of data analysis will be developed.

### 3.1. Research Method

The purpose of this study is to explore the drivers affecting consumers' attitudes and willingness to purchase, with fresh fruit and vegetables boxes online without the five senses

stimulation. Furthermore, it will be analyzed how customers become satisfied with the boxes leading to repurchase intentions.

Therefore, a quantitative research has been developed, by conducting a web survey to collect data and to test the hypothesis derived from the literature. The main objective of using quantitative research method is to develop a representation of consumers' behaviors and thoughts (Barnham, 2015).

## **3.2. Data Collection**

### **3.2.1. Research sample**

As mentioned above, the method of data collection was a web survey questionnaire which has been designed to target consumers with access to internet and that have and have not experiences of buying fresh fruit and vegetables boxes online. Therefore, survey participants were recruited by posts and private messages on Facebook, as well as by personal e-mails. The hypotheses have been tested on a sample of 285 people.

Since part of the population of interest for this study was people who have bought a box at least once and to make it easier to reach them, some Portuguese influencers related to boxes' subjects and all Portuguese boxes' companies have been contacted to share the survey on their Facebook pages. After all, the survey was shared on Facebook by one company that sells fresh fruit and vegetables boxes online, "Quinta do Arneiro", as well as by a social media influencer, "Isabel Silva", who usually promotes healthy lifestyle and a box service.

Hence, the data collection was limited to Portuguese population due to the easiness of reaching Portuguese boxes' consumers and, thus, getting a balanced demography between participants who have already bought a box once and those that have never bought it. The survey was translated to Portuguese to make it clearer and easier for participants to answer.

### **3.2.2. Measurement of variables**

#### ***Willingness to purchase***

Multi-items scale were developed to measure each of the factors shown in Figure 1: perceived quality, perceived healthiness, perceived convenience, interactivity online, information availability and perceived price.

Five-point Likert scale was used to measure the items, where 1 corresponded to "Strongly Disagree" and 5 to "Strongly Agree". A five-point scale was considered to get more specific answers and to make it easier for the participants to answer, since a larger scale could make

the questions more difficult to answer (Hand, Dall'Olmo Riley, Harris, Singh, & Rettie, 2009).

In general, the items scales were taken from previous studies and adapted to suit the objectives of the present study. In more detailed, the items scales that measure perceived convenience, perceived quality and perceived healthiness were based on the scale developed by Verhoef and Langerak (2001) and constructed with the existing literature on these factors to fit the present study. The online interactivity and information availability were measured by items adapted from Moorman (1998) alongside with literature for the purpose of the present study. Finally, measurement items for perceived price were taken from Kim et al. (2012) and adapted to fit the box schemes context.

In order to obtain an individual level, the average of each factor was computed with the average of each item that corresponds to it.

A single-item scale was developed to measure the willingness of the purchase. A five point scale was applied that range between “1- Definitely would not buy” and “5- Definitely would buy”.

### ***Satisfaction***

The scale developed to measure the satisfaction with the box characteristics, as shown in Figure 1, was taken from Cicia and Giudice (2010). A 5-point semantic scale, ranged between “1- Not at all satisfied” and “5- Completely satisfied”, was developed to measure respondents' satisfaction with each characteristic of box schemes.

Multiple-items scales were developed to measure overall satisfaction, as well as repurchase intentions. All responses were measured on a five-point Likert scale ranging from “1-Strongly Disagree” to “5-Strongly agree”. Measurement items for overall satisfaction have been adapted from Oliver (1980), the term “a flu shot” has been substituted by “this box”, to serve the present study. The average of the overall satisfaction was constructed with the average of each item in order to create an individual level.

### ***Repurchase intentions***

The items measuring repurchase intentions were adapted from scales used in Mortimer et al. (2016) by adding “a fruit and vegetable box” and replacing the term “this supermarket's website” by “from this service”. The average of the repurchase intentions was constructed with the average of each item in order to create an individual level.

### **3.3. Study Design**

The survey was designed based on the research questions defined in Chapter 1 and the conceptual framework created – Figure 1. The survey was divided into five parts.

The first part was developed to explain the purpose of the study, to inform about the possibility of participating in a draw at the end of the survey and to guarantee confidentiality and exclusivity to participants.

In the second part, participants were asked about their online grocery shopping behaviors.

In the third section, after the box schemes concept have been presented, respondents were asked to rate statements designed to measure and rank the six drivers which may influence purchase intentions and to evaluate their willingness to purchase fresh fruit and vegetables boxes online.

The fourth part was designed only for participants who have already bought a box at least once. In this section, participants were asked to distribute 100 points among the six characteristics, where the total must equal 100, according to their importance to them. Then, respondents were asked to measure their satisfaction with certain box characteristics, as well as to rate statements aimed to measure participants' overall satisfaction and their repurchase intentions.

The final part was designed to collect participants' socio-demographic characteristics, such as their age, gender, occupation and personal monthly income. In this part, respondents registered their email if they would want to participate in a drawn to get a 20€ voucher to buy a fresh fruits and vegetables box online. The drawn was developed with the aim to obtain a larger sample, as well as to encourage boxes' customers to participate in the survey.

The online survey was conducted with the aid of the online tool Qualtrics and was accessible during one week. Before the survey was launched, a pre-test among 15 people was conducted to ensure the surveys' clarity, comprehension and easiness to complete it.

Furthermore, the statistical software IBM SPSS statistics 24 was used to process the data collected. The whole web survey questionnaire is presented in the Appendix 1.

### **3.4. Data Analysis**

As mentioned above, the data collected was analyzed with the help of the statistical software - IBM SPSS statistics 24.

Firstly, the data was treated to prepare for the analysis. This was done, for instances, by recoding some relevant variables and discarding unsatisfactory respondents. Then, reliability

and validity of certain constructs were analyzed. Finally, univariate and multivariate techniques were applied to analyze the data.

Although the questionnaire was developed by taking into account the relevant literature, in some cases the items had to be adapted and modified to serve the present study. Therefore, Cronbach's alpha was measured for multi-item scales to test the reliability of each scale item and to guarantee internal consistency of the scales before testing the hypothesis. Cronbach's alpha is an important test to use in questionnaires in order to add validity and accuracy to the interpretation of data collected (Tavakol & Dennick, 2011). Also, it is an essential tool to understand how a range of items focuses on a single construct. According to Hinton, McMurray, Brownlow, & Cozens (2004), alpha's values of 0.90 and above indicate excellent reliability, while values ranging between 0.70 and 0.90 indicate high reliability. The values between 0.50 and 0.70 show moderate reliability and the values below 0.5 present low reliability.

Furthermore, a confirmatory factor analysis was conducted, with the help of IBM SPSS Amos 24 software, with the aim to identify and validate the factors used to predict the willingness to purchase. These factors, which were previously determined in Chapter 2, were perceived quality, perceived healthiness, perceived convenience, interactivity online, information availability and perceived price. Besides this, the outliers were verified to make the data appropriate for the analysis.

Confirmatory factor analysis (CFA), in general, is used to examine the relations among latent constructs and their nature (Jackson, Gillaspay, & Purc-Stephenson, 2009). Moreover, CFA tests relations between observed variables and latent variables or factors that were defined previously by the researcher. Therefore, CFA was chosen to validate the factors previously found in Chapter 2.

In order to find out and analyze sample characteristics, it was used descriptive and frequency statistics. Then, quantitative methods, including regression analysis, were applied to measure willingness to purchase, satisfaction and repurchase intentions of fresh fruits and vegetables boxes online. Moreover, means were used for regression analysis.

## Chapter 4. Results

### 4.1. General Results

#### 4.1.1. Sample characteristics

The response rate was around 72%, since 408 people started the survey and 292 have completed it. After cleaning data, including delete outliers to make it appropriate for analysis, in total, 284 participants have been considered for further analysis. The sample can be divided in two groups. The first one the people who have already bought fresh fruits and vegetables box online, which accounted to 97 participants. The other group corresponds to those that never experienced on buying it, which in total were 187 participants.

The general characteristics of the sample are presented in Appendix 2. There were more females (77,5%) than males (22,5%) participating in this study. Although the majority of the participants belong to the age range of 25-34 (34,5%), the data is well distributed among 18-24, 35-44 and 45-54 ranges. The majority of the participants are employed (70,1%) and their income concentrates in the ranges of 500-1000€ (33,8%) and 1001-1500€ (20,8%).

In sum, the average respondent is a female working, aged between 25 and 34 years old, with a monthly income between 500 and 1000€

In addition, Table 1 presents participants experience on buying their groceries online and the relation of this variable with their willingness to buy fresh fruits and vegetables online. Although without a significant difference, the majority of the participants have already experienced buying their groceries online (56,7%). Furthermore, most of these participants are willing to purchase fresh fruits and vegetables online (47,2%), while some of them would not buy it online (25,5%).

In contrast, the other part of the participants who never tried online grocery shopping (43,3%), the majority is not willing to buy fruits and vegetables online (48,0%). However, a small number of them would buy it online (14,6%). The participants that never experienced to buy their groceries online are more undecided on buying fresh fruit and vegetables online (37,4%) than the others that had already experienced it (27,3%).

**Table 1. Willingness to buy fresh fruits and vegetables online x Experience on buying groceries online**

<b>Experience on buying groceries online</b>	Yes 56,7%			No 43,3%		
<b>Willingness to buy fresh fruits and vegetables online</b> (% within experience on buying groceries online)	Yes 47,2%	Maybe 27,3%	No 25,5%	Yes 14,6%	Maybe 37,4%	No 48,0%

Table 2 presents participants' willingness to buy fresh fruits and vegetables online and its relation with their willingness to purchase fresh fruits and vegetables box online.

Participants willingness to buy fresh fruits and vegetables online is well distributed among the three categories, thus, presenting no-significant difference between them. However, it is interesting to highlight that 44% of the participants were not willing to buy fresh fruits and vegetables online would consider buying a box online with the same category of products. Moreover, 24% of the participants who are unlikely to buy fresh fruits and vegetables online are willing to buy boxes online with these kinds of products.

Furthermore, respondents that were undecided regarding their willingness to buy fresh fruits and vegetables online are more inclined to be willing to buy a box (34,4%) than the opposite (4,4%). Finally, the majority of participants who are willing to buy fresh fruits and vegetables online are also willing to buy a box with the same category of products (85,1%).

**Table 2. Willingness to purchase a box online x Willingness to buy fresh fruits and vegetables online**

<b>Fresh fruits and vegetables online</b>	Yes 33,1%			Maybe 31,7%			No 35,2%		
<b>Purchase a box online</b> (% within Fresh fruits and vegetables online)	Yes 85,1%	Maybe 14,9%	No 0%	Yes 34,4%	Maybe 61,1%	No 4,4%	Yes 24%	Maybe 44%	No 32%

#### **4.1.2. Construct reliability**

The measurement of Chronbach's Alpha to access the reliability of each construct is presented in Appendix 3.

The majority of the factors presented values of alpha between 0.5 and 0.7, indicating moderate reliability, as mentioned above. However, 'perceived quality' presented an alpha above 0.7, indicating high reliability.

Finally, 'overall satisfaction' and 'repurchase intentions' showed an excellent reliability since their alpha's values are above 0.9.

#### **4.1.3. Willingness to purchase**

The six factors that were used to predict consumers' willingness to purchase fresh fruits and vegetables boxes online were analyzed and are presented in Appendix 4.

Firstly, participants perceived boxes as healthy (mean of 3,97). They consider that boxes offer healthy fruits and vegetables, in general, chemical-free.

Respondents perceive fresh fruit and vegetables boxes schemes as convenient (mean of 3,90). In detail, they consider that using the box service is convenient and saves them more time.

Furthermore, participants value the availability of information regarding box schemes (mean of 3,89). They mainly revealed to be interested on knowing more detailed information about the products in the box. Also, they are motivated in getting information about the farm and the producer. However, they are less interested in receiving additional information on how to use the products that compose the box.

Regarding perceived quality (mean of 3,84), participants consider that boxes offer quality products. Additionally, they consider that fruits and vegetables delivered directly from the farms are more reliable in terms of quality. However they are reluctant about the freshness of the products offered in the boxes.

Regarding online interactivity, even though the mean of this construct (mean of 3,77) reflects almost indifference, respondents demonstrated interest on websites that provide tools for better perceive the quality of the fresh fruits and vegetables online. Nevertheless, it is almost indifferent for them that websites use pictures of the fresh fruits and vegetables.

Participants do not present significant perception regarding box prices (mean of 3,32). They do not consider cheaper to buy boxes and, at the same time, they do not deem that they will save money if they acquire the same amount of fruit and vegetables at supermarkets.

However, they slightly perceive that buying a box is more expensive than purchase the same quantity of fresh fruits and vegetables at supermarkets.

Regarding respondents' willingness to purchase fresh fruit and vegetable boxes online (Appendix 5), the majority of the participants are undecided (39,8%).

Moreover, a significant number of participants are positively inclined on their willingness to purchase a box (25,4%) and other part of participants definitely would buy it (22,2%). However, if these two parts of respondents were considered as a whole, the majority of participants in this study would be willing to purchase a fresh fruit and vegetables box online. Conversely, just an insignificant part of the participants consider that they would definitely not buy it (1,4%) and a small number of respondents are probably not be willing to purchase it (11,3%).

#### **4.1.4. Satisfaction**

For the analysis of this construct only part of the sample, namely the participants who have already experienced buying a fresh fruits and vegetables box online, were considered (N= 97). The analysis of respondents' satisfaction with certain box characteristics, as it was previously defined in Chapter 2, as well as the ranking of the characteristics according to the importance that participants assigned to each feature is presented in Appendix 6.

The majority of the respondents indicated the characteristics regarding the quality of the products offered in the box as the most important for them. Afterwards, they considered the characteristics related to the box composition as an important feature and, lastly, the characteristics regarding box services.

In general, participants were almost completely satisfied with the freshness of the fruits and vegetables offered in the boxes that they bought (mean of 4,55). In fact, this is the characteristic that they indicated as the most important one. Respondents are also satisfied with the flavors of the products delivered in the box (mean of 4,37). They ranked this characteristic as the second most important for them.

Participants are less satisfied with the flexibility of delivery (mean of 3,82) in terms of days and hours. Nevertheless, they considered this characteristic as the less important of all. Although respondents considered the flexibility to compose the box with the products that they want as the third characteristic that they value most, they were not entirely satisfied with it (mean of 3,76).

The mean for the overall satisfaction is 4.20 (Appendix 7). This means that, in general, respondents were satisfied with the boxes that they bought. Besides, they consider their choice regarding the box as wise.

#### **4.1.5. Repurchase intentions**

Interesting results can be verified when analyzing repurchase intentions (Appendix 8) of participants who have already experienced buying fresh fruits and vegetables boxes online (N=97).

As mentioned above, even though participants are satisfied with the box that they bought, the mean of their repurchase intentions is 3.88. Respondents expect and will probably repurchase in a near future a box from the service that they considered to answer. However, the item “I usually repurchase a fruit and vegetable box from this service” presents a mean below the average scores. This may be a result of participants that bought a box once to try or that stop buying for a certain reason.

## **4.2. Hypothesis Testing**

### **4.2.1. Willingness to purchase**

A confirmatory factor analysis was conducted to identify and validate the factors, such as perceived quality, perceived healthiness, perceived convenience, interactivity online, information availability and perceived price, that would be used to predict the willingness to purchase fresh fruits and vegetables box online.

In result, all standardized factor loadings (Appendix 9) presented values above 0.35 and, thereby, according to Hair, Black, Anderson and Tatham (1998), with the sample size used for this part of the study (N=284) this values are acceptable for assessing the practical significance of standardized factor loadings. Besides, some loadings are equal and higher to 0.7 indicating a strongly relation of the items with their associated constructs (Hair, Anderson, Babin, & Black, 2010). Moreover, all factor loadings were statistically significant ( $p < 0.05$ ), which reveals that each item selected for each latent variable reflects a single construct. Therefore, all factors were considered for the multiple regression analysis.

Furthermore, Pearson's R correlation has been computed and results showed that there are no strong relationships between explanatory variables, with all the relations being lower than 0.7. This study used a multiple regression model. Thereby, it is important to check multicollinearity since this is defined by the presence of linear relationships among

explanatory variables (Silvey, 1969) that may generate various effects on estimated coefficients in this type of analysis (Mansfield & Helms, 1982). Multicollinearity can be detected by examining the variance inflation factors (VIF's), the condition indexes and the tolerance indicator (Mansfield & Helms, 1982; Chennamaneni, Echambadi, Hess, & Syam, 2016; Craney & Surles, 2002; O'brien, 2007). Some authors suggest that values of VIF above 5, as well as tolerance of less than 0.2, indicate multicollinearity. Moreover, condition index above 30 indicate the existence of multicollinearity.

As it can be seen in Appendix 10, there is no multicollinearity in this model since VIF's are lower than 5 and tolerance indicators are higher than 0,2 . Also, condition index for this model is lower than 30.

This study conducted a multiple regression analysis for the impacts of the factors (independent variables), such as perceived quality, perceived healthiness, perceived convenience, information availability, interactivity online, and perceived price, on the willingness to purchase fresh fruit and vegetable boxes online (dependent variable). Furthermore, means of the factors constructed were used for the regression analysis.

As Table 3 shows, the model is significant with a confidence level of 95% and explains 41,5% of the variance in the willingness to purchase.

**Table 3. Quality of Regression Model 1 (n=284)**

	<b>R</b>	<b>R<sup>2</sup></b>	<b>Adjusted R<sup>2</sup></b>	<b>F-value</b>	<b>df</b>	<b>Sig.</b>
<b>Model 1</b>	0,654	0,427	0,415	34,469	6	0,000

Table 4 presents the results of the multiple regression analysis for the effects of the factors on the willingness to purchase. As it can be seen, the model performed for this analysis revealed a significant effect (P-value < 0,05) of perceived quality (p-value= 0,002;  $\beta$ = 0,311), perceived healthiness (p-value= 0,031;  $\beta$ = 0,217), perceived convenience (p-value= 0,000;  $\beta$ = 0,532), and information availability (p-value= 0,003;  $\beta$ = 0,248) on the willingness to purchase. This means that perceived quality will affect positively consumer's willingness to purchase fresh fruits and vegetables boxes online. The some happen with perceived healthiness, perceived convenience and information availability. Therefore, both hypothesis *H1a*, *H1b*, *H1c* and *H1e* respectively were all supported.

From *H1d*, it was expected that the perceived price would negatively affect the willingness to purchase fresh fruits and vegetables boxes online. This expectation is not supported since p-value > 0,05 and, therefore, *H1d* is rejected in this study (p-value = 0,525).

*H1f* is not supported, as interactivity online did not positively affect consumers' willingness to purchase fresh fruit and vegetables boxes online (p-value = 0,632).

Furthermore, Table 13, also shows that perceived convenience (Standardized  $\beta$ = 0,352) has the strongest effect on the willingness to purchase comparing with the other variables. Conversely, perceived healthiness (Standardized  $\beta$ = 0,138) has the weakest effect on the willingness to purchase. Besides, perceived quality (Standardized  $\beta$ = 0,202) has more effect on the willingness to purchase than information availability (Standardized  $\beta$ = 0,167).

**Table 4. Coefficients of Regression Model 1 (N=284)**

<b>Model 1</b>	<b><math>\beta</math></b>	<b>Std. Error</b>	<b>Standardized <math>\beta</math></b>	<b>t</b>	<b>Sig.</b>
Perceived Quality	0,311	0,101	0,202	3,091	0,002
Perceived Healthiness	0,217	0,100	0,138	2,170	0,031
Perceived Convenience	0,532	0,086	0,352	6,212	0,000
Information Availability	0,248	0,082	0,167	3,037	0,003
Interactivity online	-0,034	0,071	-0,026	-0,479	0,632
Perceived Price	-0,039	0,060	-0,030	-0,637	0,525

#### **4.2.2. Satisfaction**

Firstly, a simpler regression analysis was conducted for the impact of consumers' willingness to purchase fresh fruit and vegetables boxes online on their overall satisfaction. Besides that, means were used for the regression analysis. Pearson's R correlation indicates that these two variables are weakly correlated (0,485).

For this analysis only part of the sample was considered (N=97), namely the participants who have already bought a box online. This is mainly because satisfaction can only be measured with people who tried the product at least once.

As it can be verified in Table 5 , this model is significant with a confidence level of 95% and 22,7% of the overall satisfaction variance is explained by the willingness to purchase.

Furthermore, Table 6 shows a significance effect of the willingness to purchase (p=0,000;  $\beta$ =0,445) over the overall satisfaction. This means that consumer's willingness to purchase fresh fruits and vegetables box online will positively affect their overall satisfaction. Therefore, *H2* was supported.

**Table 5. Quality of Regression Model 2 (N=97)**

	<b>R</b>	<b>R<sup>2</sup></b>	<b>Adjusted R<sup>2</sup></b>	<b>F-value</b>	<b>df</b>	<b>Sig.</b>
<b>Model 2</b>	0,485	0,235	0,227	29,178	1	0,000

**Table 6. Coefficients of Regression Model 2 (N=97)**

<b>Model 2</b>	<b>β</b>	<b>Std. Error</b>	<b>Standardized β</b>	<b>t</b>	<b>Sig.</b>
Willingness to purchase	0,445	0,082	0,485	5,402	0,000

Then, a multiple regression analysis was conducted to predict the degree that certain characteristics of the boxes contribute to overall consumers' satisfaction. By analyzing the obtained regression model, Model 3a (Appendix 11), it was detected a problem of multicollinearity since condition index was above 30. Therefore, Pearson's R correlation was analyzed and two independent variables presented a strong relationship, namely "Freshness of the products" and "Flavor of the products". Also, these variables are the ones that exhibited the highest VIF. Hence, the model was re-estimated twice generating Model 3b and Model 3c, each one excluding one of these independent variables and without showing multicollinearity (Appendix 12 and 13). Model 3c is presented in Appendix 13.

After comparing the adjusted R<sup>2</sup> of Model 3b (adjusted R<sup>2</sup>=0,580) and Model 3c (adjusted R<sup>2</sup>=0,531), the first one was selected mainly because exhibit the highest value and, thereby, it explains more of the variation in the overall satisfaction.

Table 7 and 8 presents multiple linear regressions analysis of Model 3b, which includes, as mentioned above, the independent variable "Freshness of the products" and exclude the variable "Flavor of the products". In detail, this model predicts the degree that each box characteristic contributes to the overall consumers' satisfaction

As it can be seen in table 7, this model is significant at a confidence level of 95% and explains 58% of the variance in overall consumer's satisfaction.

**Table 7. Regression Model 3b quality (n=97)**

	<b>R</b>	<b>R<sup>2</sup></b>	<b>Adjusted R<sup>2</sup></b>	<b>F-value</b>	<b>df</b>	<b>Sig.</b>
<b>Model 3b</b>	0,776	0,602	0,580	27,562	5	0,000

Table 8 shows that the flexibility to compose the box (p-value= 0,000; β= 0,243), the freshness of the products (p-value= 0,000; β= 0,462) and the precision of the products (p-value= 0,031; β= 0,148) were positively significant (p-value < 0,05) for overall customers'

satisfaction. This means that a higher level of customers' satisfaction with the flexibility to compose the box with the products that they want will lead to a higher degree of their overall satisfaction. Also, a higher level of customers' satisfaction with the freshness of the products offered in the box will lead to a higher degree of their overall satisfaction. Moreover, a higher level of customers' satisfaction with the precision of the service, in terms of delivering the exact products that they ordered, will lead to a higher degree of their overall satisfaction. Therefore, *H3a*, *H3c* and *H3e* were supported.

Furthermore, it was expected that the level of customers' satisfaction with the variety of the products offered in the box (p-value= 0,830;  $\beta$ = -0,017), as well as with the flexibility of the service (p-value= 0,184;  $\beta$ = 0,073), in terms of days and hours, will have a positive impact on the degree of their overall satisfaction. This expectation is not supported since p-value > 0,05 and, therefore, *H3b* and *Hf* were rejected in this study.

Finally, Table 8, also shows that customers' satisfaction with the flexibility to compose the box (Standardized  $\beta$ = 0,402) has the main significant effect on the degree of their overall satisfaction, followed closely by customers' satisfaction with the freshness of the products in the box (Standardized  $\beta$ = 0,395).

**Table 8. Coefficients of regression Model 3b (N=97)**

<b>Model 3b</b>	<b><math>\beta</math></b>	<b>Std. Error</b>	<b>Standardized <math>\beta</math></b>	<b>t</b>	<b>Sig.</b>
Flexibility of composition	0,243	0,053	0,402	4,550	0,000
Variety of composition	- 0,017	0,079	-0,019	-0,215	0,830
Freshness of the products	0,462	0,085	0,395	5,431	0,000
Precision of the service	0,148	0,067	0,177	2,190	0,031
Flexibility of delivery	0,073	0,054	0,107	1,339	0,184

#### **4.2.3. Repurchase intentions**

A simple linear regression analysis, that used the mean of the variables, was conducted to predict customers' repurchase intention on the basis of their overall satisfaction. Pearson's R correlation indicates that these two variables are strongly correlated (0,784).

Besides this, also only part of the sample was considered (N=97) for this analysis, namely the participants who have already bought a box online.

Table 9 shows that the model is significant at a confidence level of 95% and 61% of the variance in consumers' repurchase intentions of buying a fresh fruits and vegetables box online can be explained by their overall satisfaction.

As it can be seen in Table 10, the overall satisfaction (p-value= 0,000;  $\beta=1,045$ ) was positively significant (p-value <0,05) for repurchase intentions, indicating that customer overall satisfaction will positively affect customer' intention of repurchase fresh fruits and vegetables boxes online. Therefore *H4* was supported.

**Table 9. Regression Model 4 quality (N=97)**

	<b>R</b>	<b>R<sup>2</sup></b>	<b>Adjusted R<sup>2</sup></b>	<b>F-value</b>	<b>df</b>	<b>Sig.</b>
<b>Model 4</b>	0,784	0,614	0,610	151,300	1	0,000

**Table 10. Coefficients of regression Model 4 (N=97)**

<b>Model 4</b>	<b><math>\beta</math></b>	<b>Std. Error</b>	<b>Standardized <math>\beta</math></b>	<b>t</b>	<b>Sig.</b>
Overall satisfaction	1,045	0,085	0,784	12,300	,000

## **Chapter 5. Discussion**

The essence of this study is understand which factors drive consumers to buy fresh fruit and vegetables boxes by e-commerce, which is entirely dependent on the online environment and not on the sensory experiment of the product itself. Also, this research attempts to find which box schemes' characteristics influence customers' overall satisfaction leading to repurchase intentions. Hence, in the following section, conclusions, limitations and directions for future research will be discussed.

### **5.1. Conclusions**

In concordance with Cho (2010), consumers are not so susceptible to buy fresh fruits and vegetables online. This idea is reinforced by the fact that even the most of consumers who have already experienced buying their groceries online are undecided and would not buy fresh fruits and vegetables online.

An important finding gathered by this study is that box schemes can attenuate the unacceptance of buying these products online. Since, the majority of consumers, who are not willing to buy fresh fruits and vegetables online, become undecided when thinking on buying

these products through box ordered online. And, also, a significant part of these consumers considers buying these products online through box schemes. Additionally, consumers who are not sure about buying fresh fruits and vegetables online are more inclined to buy these products through box schemes. In accordance with Forsythe and Shi (2003), the uncertainty about product quality is one reason for consumers to not buy online, especially sensory products with variable quality (Cho, 2010; De Figueiredo, 2000).

Fresh fruits and vegetables, which are characterized by their variable quality, hardly deliver sensory inputs through the online environment. De Figueiredo (2000) highlights that even if consumers know the product and recognize the brand, they need to see and touch the individual product with a variable quality to feel it before the online purchase. Hence, when buying fresh fruits and vegetables boxes online, likewise online grocery shopping, consumers cannot examine physically the products before buying them. Therefore, as it was expected, this research confirms that perceived quality positively affect consumers' willingness to purchase fresh fruit and vegetables box online.

The box schemes core business is to sell sensory products with variable quality through the web. Therefore, it is very important that these businesses can ensure the quality of the products in the box that is delivered to customers' houses in order to not disappoint them when receiving their order and minimize consumers' uncertainties regarding the quality of the sensory product.

Furthermore, this study confirms that information availability will positively affect consumers' willingness to purchase fresh fruits and vegetables boxes online. Indeed, there are some limitations on delivering to consumers enough information about sensory attributes through internet, such as the physical appearance of fresh fruits and vegetables that would be impossible to examine and get information about it (Degeratu et al., 2000; Forsythe & Shi, 2003). Hence, in accordance to Cho (2010), if box schemes are not able to deliver sensory inputs directly to consumers they should put an extra effort into delivering detailed information of the products that would be offered in the box, in order to reduce their uncertainty.

Moreover, this study confirms that perceived healthiness will positively affect consumers' willingness to purchase fresh fruits and vegetables boxes online. In concordance with Tudoran et al. (2009), how consumers perceive health and products' healthiness are important factors that influence their perceptions and influence their decision making regarding food choice. In general, consumers' associate health in food to some product attributes such as natural, without additives, fresh and nutritious (Tudoran et al., 2009). Consumers considered

that box schemes offered healthy products. This association can come mainly from the healthy properties that characterize fresh fruits and vegetables, as well as from the healthy promotion that these products have been experienced globally over the years (Salvin 2012). They further consider that fruits and vegetables offered in the boxes are chemical-free. This chemical-free association to box schemes may come from the fact that most of the services offer organic products and consumers consider organic food healthier than the conventional (Brown et al., 2009; Magnusson et al., 2003).

Furthermore, this research confirms that consumers' perception of box schemes as a convenient service drives their willingness to purchase a fresh fruits and vegetables box in the online environment. This reinforces the similarities of this service to online grocery shopping, where, according to researchers (Anckar et al., 2002; Cho, 2010; Hansen, 2005; Morganosky & Cude 2000), convenience is the main driver of it. Indeed, online shopping, as well as purchasing fresh fruits and vegetables boxes online brings many advantages to consumers as greater convenience and time saving. Moreover, according to Hollywood et al. (2013), when some consumers are under time pressure they are unlikely to choose healthy products. Therefore, box schemes can be a convenient way for consumers make a healthful shopping.

Unfortunately, although it was hypothesized that interactivity online would positively affect consumers' willingness to purchase fresh fruit and vegetables online no significant result was found.

Furthermore, it was hypothesized that perceived price will affect negatively the willingness to purchase. But, no significant result was found.

Another important finding gathered by this study, is that consumers' willingness to purchase fresh fruits and vegetables box online will positively affect their overall satisfaction with the box. In accordance with Tudoran et al. (2009), when consumers are willing to order a box online, they create some expectations for a desired outcome, regarding the fruits and vegetables inside the box, influencing their overall satisfaction with the box. Besides that, consumers are uncertain about the results of ordering a box online with fresh fruits and vegetables, since those have a variable quality. Therefore they are more insecure if the box ordered online will reach their expectations and, consequently, if they become satisfied. Additionally, in concordance to Chen and Chang (2003), the experiences resulted from the consumption of the fruits and vegetables that the box offered led to consumers' satisfaction or dissatisfaction.

Furthermore, this study confirms that the level of consumers' satisfaction with the flexibility to compose the box with the products that they want will positively contribute to the degree of

their overall satisfaction with the box. The same happened to the level of consumers' satisfaction with the freshness of the products inside of the box and with the precision of the service to deliver the exact products that they ordered.

Firstly, consumers' satisfaction increases with the flexibility to compose the box. Therefore, box schemes should offer a customized box option, apart from the box pre-designed by producers. Also, producers should allow consumers to change products of the pre-designed boxes that they present weekly to customers. According to Cicia and Giudice (2010), consumers who buy fruits and vegetables boxes online expect that the freshness of the products, which come in the box, is more than satisfactory. Then, their satisfaction can increase with the precision of the box's service, in terms of producers delivering the exact products that consumers ordered.

Unfortunately, although it was hypothesized that the level of customers' satisfaction with the variety of the box composition would contribute positively to the degree of their overall satisfaction with the box, no significant result was found.

The same happened to the level of customers' satisfaction with the flavor of products and with the flexibility of box's delivery.

Finally, this study confirms that customers' overall satisfaction will positively affect their intentions to repurchase a fresh fruit and vegetable box online. In concordance to Mortimer et al. (2016), satisfaction is one of the most important factors that drives consumer to repurchase. Indeed, consumers may not repeat their purchase if their product's performance expectation is not met and/or if the product surprised them negatively (Hansen, 2006).

Consumers ordered boxes online with fresh fruits and vegetables, which have a variable quality, mainly because they trust the producer to select the products inside the box. Therefore, if they experience a continued satisfying result they are likely to repurchase (Mortimer et al., 2016; Oliver, 1999).

After all, the researches questions have been addressed and confirmed. In order to reduce consumers uncertainty on buying sensory products with a variable quality online, box schemes businesses should put an extra effort into increasing consumers perceived quality, perceived healthiness, and perceived convenience of fresh fruit and vegetable box ordered online. Moreover, it should provide detailed information of the products that would be offered in the box. Furthermore, in order to increase customers' overall satisfaction that will lead to their repurchase intentions, box schemes must allow customers to customize a box and change the products offered in the pre-designed box. Also, they must be careful on delivering fresh fruits and vegetables inside of the boxes as well as the exact products that customers ordered.

## **5.2. Limitations and future research**

One of the main limitations of this research is the fact that there is a significant lack of academic literature concerning box schemes and consumers' behaviors and attitudes regarding this business. This limited the study to be on the basis of online grocery shopping.

This research also presents another limitation regarding the sample collected. Although this research presents a significant number of respondents, it was limited to Portuguese participants, which make it poorly diversified. This can influence the relationship among the variables used in this study. Therefore, future research should develop a diversified sample to better coincide the literature with the results obtained.

Even though perceived healthiness was found as an important predictor of willingness to purchase fresh fruits and vegetables box online, the results obtained in this research do not provide a complete insight of this factor. This is mainly because some box schemes focus their businesses on delivering organic fruits and vegetables. Hence, this could influence participants of the study who already know the concept of box schemes. Thus, the organic concept is a potential important factor that was not investigated in the present study.

Therefore, it is suggested that future researchers expand deeply the healthier factor including organic and non-organic terms to understand the effect of this factor on the willingness to purchase fresh fruits and vegetables boxes online. In addition, the results of this study for the factor perceived convenience, which was found to be an important predictor of willingness to purchase fresh fruits and vegetables box online, cannot provide fully insight. This can be explained, in general, by the fact that box schemes provide two options for consumers to order a box. They can order a box promptly; in other words, they can order it whenever they want, or they can subscribe the service to weekly or fortnightly. Consumers' perceived convenience can differ dependently of the option that the service offers. Therefore, future researches should be developed to deeply explore these two options in terms of consumers' perceived convenience regarding box schemes.

Finally, future research may seek to verify the proposed conceptual model due to the multidimensionality that it presents.

## Appendices

### Appendix 1: Online questionnaire

#### Q1 Introdução

Caro participante,

O questionário que se segue faz parte da minha tese de mestrado e, por isso, as suas respostas são fundamentais. O objetivo é compreender o que leva os consumidores a estarem dispostos a comprar cabazes de frutas e legumes online e, conseqüentemente, avaliar a sua satisfação.

Levará cerca de 8 minutos a responder. As suas respostas são estritamente confidenciais e serão utilizadas exclusivamente para o estudo em questão.

No final do questionário pode habilitar-se a ganhar um voucher de 20€, que irá ser sorteado, para utilizar na compra de um cabaz de frutas e legumes online.

Caso surja alguma dúvida ou preocupação, por favor não hesite em contactar-me através do e-mail joanabandeira3@gmail.com.

Muito obrigada,

Joana Bandeira Costa  
Católica-Lisbon School of Business & Economics

#### Q2 É Português?

- Sim (1)
- Não (2)

Condition: Não Is Selected. Skip To: End of Survey.

#### Q3 Já fez compras de supermercado online?

- Sim (1)
- Não (2)

#### Q4 Qual a sua pré-disposição para comprar frutas e legumes frescos online?

- Definitivamente não compraria (1)
- Provavelmente não compraria (2)
- Poderia comprar (3)
- Provavelmente compraria (4)
- Definitivamente compraria (5)

**Q5 Conhece o conceito de encomendar cabazes de frutas e legumes online?**

- Sim (1)
- Não (2)

**Q6 IMPORTANTE: Para as seguintes perguntas considere o serviço do cabaz de frutas e legumes em geral, em vez de um específico que conheça ou um a que esteja habituado.**

O serviço de entrega de cabazes de frutas e legumes traduz-se, geralmente, em:

- Os cabazes são compostos por frutas e legumes frescos locais.
- O cabaz vem diretamente das quintas e é entregue pelos produtores.
- Os produtores pré-selecionam semanalmente os produtos que compõem os cabazes.
- Os produtos selecionados dependem da sua sazonalidade.
- No website da empresa consegue ter acesso à composição do cabaz selecionado para cada semana.
- A encomenda é feita online no website da empresa e entregue numa morada selecionada por si.
- Pode encomendar quando quiser ou pode subscrever o cabaz para receber todas as semanas ou de 15 em 15 dias. A entrega do cabaz pode sempre ser cancelada com antecedência.
- Pode escolher o dia e horário de entrega, mas dentro das possibilidades oferecidas pelo produtor.

**Q7 Alguma vez comprou cabazes de frutas e legumes?**

- Sim e continuo a comprar (1)
- Sim, mas já não compro (2)
- Não (3)

**Q8 Tendo em consideração as características do serviço em geral descrito acima, por favor indique em que medida concorda com as seguintes afirmações com base na sua opinião.**

	Discordo totalmente (1)	Discordo (2)	Não concordo nem discordo (3)	Concordo (4)	Concordo totalmente (5)
Frutas e legumes frescos entregues diretamente das quintas são mais confiáveis em termos de qualidade (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Os cabazes oferecem frutas e legumes saudáveis (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Usar o serviço dos cabazes de frutas e legumes é conveniente (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Quero saber mais sobre as frutas e os legumes que vêm no cabaz (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Prefiro encomendar os cabazes em sites	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

que usam fotografias para mostrar as frutas e legumes frescos (5)					
Os cabazes oferecem frutas e legumes mais frescos (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Q9 Tendo em consideração as características do serviço em geral descrito acima, por favor indique em que medida concorda com as seguintes afirmações com base na sua opinião.**

	Discordo totalmente (1)	Discordo (2)	Não concordo nem discordo (3)	Concordo (4)	Concordo totalmente (5)
Provavelmente vou poupar mais dinheiro ao comprar a mesma quantidade de frutas e legumes num supermercado do que comprar um cabaz (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Os cabazes oferecem produtos de qualidade (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Encomendar cabazes de frutas e legumes poupa-me muito tempo (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Gostaria de receber informação adicional sobre como usar as frutas e os legumes do cabaz (ex: Receitas) (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Comprar um cabaz poderá ser mais caro do que comprar a mesma quantidade de frutas e legumes no supermercado (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Q10 Tendo em consideração as características do serviço em geral descrito acima, por favor indique em que medida concorda com as seguintes afirmações com base na sua opinião.**

	Discordo Totalmente (1)	Discordo (2)	Não concordo nem discordo (3)	Concordo (4)	Concordo totalmente (5)
Os cabazes oferecem frutas e legumes sem químicos (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Estou interessado em procurar mais informação sobre a quinta e os produtores do cabaz (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eu gosto de websites que fornecem ferramentas que me ajudem a perceber melhor a qualidade das frutas e dos legumes frescos online (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Poderá ser mais barato comprar um cabaz do que comprar a mesma quantidade de frutas e legumes no supermercado (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Q11 Por favor indique a frase que melhor se aplica a si tendo em consideração o seguinte:**

"A minha disposição para comprar um cabaz de frutas e legumes é...":

- Definitivamente não compraria (1)
- Provavelmente compraria (2)
- Poderia comprar (3)
- Provavelmente compraria (4)
- Definitivamente não compraria (5)

Display This Question:

If Alguma vez comprou cabazes de frutas e legumes? Sim e continuo a comprar Is Selected  
Or Alguma vez comprou cabazes de frutas e legumes? Sim, mas já não compro Is Selected

**Q12 IMPORTANTE: Para as seguintes perguntas considere o último serviço de cabazes de frutas e legumes que encomendou.**

**Por favor distribua 100 pontos entres as seguintes características de acordo com a importância que lhes atribui caso comprasse um cabaz de frutas e legumes online.**

**(Maior pontuação = maior importância)**

- \_\_\_\_\_ A flexibilidade de compor o cabaz (com os produtos que deseja) (1)
- \_\_\_\_\_ A variedade das frutas e legumes oferecidos no cabaz (2)
- \_\_\_\_\_ O sabor dos produtos no cabaz (3)
- \_\_\_\_\_ A frescura dos produtos no cabaz (4)
- \_\_\_\_\_ A precisão do serviço (entregarem os produtos exactos que encomendou) (5)
- \_\_\_\_\_ A flexibilidade da entrega (dias e horas) (6)

Display This Question:

If Alguma vez comprou cabazes de frutas e legumes? Sim e continuo a comprar Is Selected  
Or Alguma vez comprou cabazes de frutas e legumes? Sim, mas já não compro Is Selected

**Q13 Para as seguintes perguntas considere o último serviço de cabazes de frutas e legumes que encomendou .**

**Por favor indique a categoria que melhor descreve a sua satisfação sobre as características do último serviço de cabazes de frutas e legumes que encomendou .**

**(1=Nada satisfeito; 5=Completamente satisfeito)**

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)
A flexibilidade de compor o cabaz (com os produtos que deseja) (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A variedade das frutas e legumes oferecidos no cabaz (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
O sabor dos produtos (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A frescura dos produtos (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A precisão do serviço (entregarem os produtos exactos que encomendou) (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A flexibilidade de entrega (dias e horas) (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Display This Question:

If Alguma vez comprou cabazes de frutas e legumes? Sim e continuo a comprar Is Selected  
Or Alguma vez comprou cabazes de frutas e legumes? Sim, mas já não compro Is Selected

**Q14 Por favor tendo em consideração o último serviço de cabazes de frutas e legumes que encomendou. Em que medida concorda com as seguintes afirmações?**

	Discordo Totalmente (1)	Discordo (2)	Não concordo nem discordo (3)	Concordo (4)	Concordo Totalmente (5)
Estou satisfeito com a minha decisão de comprar esta cabaz de frutas e legumes (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
É provável que eu vá recomprar um cabaz deste serviço num futuro próximo (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A minha escolha de comprar este cabaz de frutas e legumes foi sábia (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Espero recomprar um cabaz deste serviço num futuro próximo (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Penso que fiz a coisa certa em comprar este cabaz (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eu recompro habitualmente um cabaz deste serviço (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Display This Question:

If Alguma vez comprou cabazes de frutas e legumes? Sim e continuo a comprar Is Selected  
Or Alguma vez comprou cabazes de frutas e legumes? Sim, mas já não compro Is Selected

**Q15 Por favor escreva o nome da empresa em que se baseou para responder às duas perguntas anteriores sobre a compra de cabazes de frutas e legumes.**

**Q16 Está quase a chegar ao fim...Por favor indique a sua idade**

- <18(1)
- 18-24 (2)
- 25-34 (3)
- 35-44 (4)
- 45-54 (5)
- 55-64 (6)
- 65 or more (7)

**Q17 Por favor indique o seu género.**

- Masculino (1)
- Feminino (2)

**Q18 Por favor indique a sua ocupação.**

- Estudante (1)
- Trabalhador-estudante (2)
- Dona(o) de casa (3)
- Trabalhador (4)
- Desempregado (5)
- Reformado (6)
- Incapacitado para trabalhar (7)

**Q19 Por favor indique o seu rendimento pessoal mensal líquido: (ou mesada)**

- < 500€ (1)
- 500 - 1000€ (2)
- 1001 - 1500€ (3)
- 1501 - 2000€ (4)
- 2001 - 2500€ (5)
- 2501-3000€ (6)
- 3001- 3500€ (7)
- >3500€ (8)

**Q34 Muito obrigada pela sua participação. Por favor insira o seu e-mail se quiser participar no sorteio para ganhar um voucher de 20€ para utilizar na compra de um cabaz biológico de frutas e legumes.**

## Appendix 2: Sample Characteristics (N=284)

<b>Age</b>	
18-24	16,5%
25-34	34,5%
35-44	17,6%
45-54	18,0%
55-64	9,9%
≥ 65	3,5%
<b>Gender</b>	
Female	77,5%
Male	22,5%
<b>Occupation</b>	
Student	12,0%
Student-worker	8,5%
Housewife	1,4%
Employed	70,1%
Unemployed	3,2%
Retired	4,9%
<b>Monthly personal net income</b>	
<500	15,5%
500 - 1000€	33,8%
1001 - 1500€	20,8%
1501 - 2000€	10,2%
2001 - 2500€	9,5%
2501-3000€	2,8%
3001- 3500€	2,8%
>3500€	4,6%

### Appendix 3: Chronbach's Alpha measurement

Chronbach's Alpha measurement of each factor (N=284)

<b>Item</b>	<b>N of items</b>	<b>Cronbach's Alpha</b>
Perceived Quality	3	0,752
Perceived Healthiness	2	0,610
Perceived Convenience	2	0,649
Information Availability	3	0,691
Interactivity Online	2	0,505
Perceived Price	3	0,662
<b>Total of items</b>	<b>15</b>	<b>0,765</b>

Chronbach's Alpha measurement of overall satisfaction and repurchase intention (N=97)

<b>Item</b>	<b>N of items</b>	<b>Cronbach's Alpha</b>
Overall Satisfaction	3	0,922
Repurchase Intentions	3	0,917

#### Appendix 4: Analysis of the factors

Factors	Mean	Std. Deviation
Fresh fruits and vegetables delivered directly from the farms are more reliable in terms of quality	3,95	0,81
The boxes offer fruits and vegetables more fresh	3,65	0,89
The boxes offer quality products	3,92	0,67
<b>Perceived Quality</b>	<b>3,84</b>	<b>0,65</b>
The boxes offer healthy fruits and vegetables	4,01	0,71
The boxes offer chemical-free fruits and vegetables	3,93	0,80
<b>Perceived Healthiness</b>	<b>3,97</b>	<b>0,64</b>
Using online fruit and vegetables boxes service is convenient	3,90	0,71
Buying fruits and vegetables online boxes saves much time	3,89	0,83
<b>Perceived Convenience</b>	<b>3,90</b>	<b>0,66</b>
I want to know more details about the fruits and vegetables offer in the box	4,04	0,81
I would like to receive additional information on how to use the fruits and vegetables that compose the box (e.g.: Recipes)	3,76	0,96
I am interested in looking for information about the farm and the producer	3,88	0,79
<b>Information Availability</b>	<b>3,89</b>	<b>0,67</b>
I prefer to buy the boxes through websites that use pictures to show the fresh fruits and vegetables	3,60	1,08
I like websites that provide tools that help me to better perceive the quality of fresh fruits and vegetables online	3,94	0,75
<b>Interactivity Online</b>	<b>3,77</b>	<b>0,76</b>
Buying a box may be more expensive than buy the same quantity of fresh fruits and vegetables at supermarkets	3,50	0,97
I will probably save more money buying the same amount of fruits and vegetables at a supermarket than buy a box	3,25	1,02
It may be cheaper to buy a box than buy the same quantity of fresh fruits and vegetables at supermarkets (reverse)	3,20	1,01
<b>Perceived Price</b>	<b>3,32</b>	<b>0,77</b>

## Appendix 5: Willingness to purchase analysis

<b>Willingness to purchase</b>	
I definitely would not buy it	1,4%
I probably would not buy it	11,3%
I might buy it	39,8%
I probably would buy it	25,4%
I definitely would buy it	22,2%
<b>Mean</b>	<b>3,56</b>

## Appendix 6: Box's characteristics analysis

<b>Box's Characteristics</b>	<b>Importance</b>	<b>Satisfaction</b>	
	<b>Rank</b>	<b>Mean</b>	<b>Std. Deviation</b>
Flexibility to compose the box	3	3,76	1,25
Variety of the products in the box	4	4,09	0,86
Products' flavor	2	4,37	0,84
Freshness of the products	1	4,55	0,64
Precision of the service	5	4,15	0,91
Flexibility of delivery	6	3,82	1,12

## Appendix 7: Overall Satisfaction analysis

<b>Items</b>	<b>Mean</b>	<b>Std. Deviation</b>
I am satisfied with my decision to purchase this fruit and vegetable box	4,14	0,87
My choice to purchase this this fruit and vegetable box was a wise one	4,31	0,71
I think I did the right thing by buying this fruit and vegetable box	4,16	0,85
<b>Overall Satisfaction</b>	<b>4,20</b>	<b>0,76</b>

## Appendix 8: Repurchase Intentions analysis

<b>Items</b>	<b>Mean</b>	<b>Std. Deviation</b>
It is likely that I will repurchase a fruit and vegetable box from this service in the near future	3,98	1,03
I usually repurchase a fruit and vegetable box from this service	3,63	1,22
I expect to repurchase a fruit and vegetable box from this service in the near future	4,04	1,00
<b>Repurchase Intentions</b>	<b>3,88</b>	<b>1,01</b>

## Appendix 9: Confirmatory Factor Analysis

Items	Factor Loading	R <sup>2</sup>
<b><i>Perceived Quality</i></b>		
Fresh fruits and vegetables delivered directly from the farms are more reliable in terms of quality	0,662	0,438
The boxes offer fruits and vegetables more fresh	0,723	0,522
The boxes offer quality products	0,757	0,573
<b><i>Perceived Healthiness</i></b>		
The boxes offer healthy fruits and vegetables	0,616	0,379
The boxes offer chemical-free fruits and vegetables	0,718	0,516
<b><i>Perceived Convenience</i></b>		
Using online fruit and vegetables boxes service is convenient	0,876	0,767
Buying fruits and vegetables online boxes saves much time	0,555	0,308
<b><i>Information Availability</i></b>		
I want to know more details about the fruits and vegetables offer in the box	0,687	0,472
I would like to receive additional information on how to use the fruits and vegetables that compose the box (e.g.: Recipes)	0,568	0,323
I am interested in looking for information about the farm and the producer	0,751	0,564
<b><i>Online Interactivity</i></b>		
I prefer to buy the boxes through websites that use pictures to show the fresh fruits and vegetables	0,399	0,159
I like websites that provide tools that help me to better perceive the quality of fresh fruits and vegetables online	0,905	0,818
<b><i>Perceived Price</i></b>		
Buying a box may be more expensive than buy the same quantity of fresh fruits and vegetables at supermarkets	0,642	0,523
I will probably save more money buying the same amount of fruits and vegetables at a supermarket than buy a box	0,611	0,373
It may be cheaper to buy a box than buy the same quantity of fresh fruits and vegetables at supermarkets (reversed)	0,723	0,412

**Appendix 10: Multicollinearity analysis of Model 1 (N=284) (DV: willingness to purchase)**

<b>Model 1</b>	<b>Tolerance</b>	<b>VIF</b>
Perceived Quality	,482	2,077
Perceived Healthiness	,511	1,956
Perceived Convenience	,642	1,557
Information Availability	,684	1,462
Interactivity online	,715	1,399
Perceived Price	,955	1,047

<b>Dimension</b>	<b>Eigenvalue</b>	<b>Condition Index</b>
1	6,862	1,000
2	,056	11,029
3	,030	15,185
4	,020	18,185
5	,015	21,715
6	,009	27,299
7	,008	29,292

**Appendix 11: Multiple regression analysis of Model 3a (N=97) (DV: overall satisfaction)**

	<b>R</b>	<b>R<sup>2</sup></b>	<b>Adjusted R<sup>2</sup></b>	<b>F-value</b>	<b>df</b>	<b>Sig.</b>
<b>Model 3a</b>	,778	,605	,579	23,021	6	,000

<b>Model 3a</b>	<b>β</b>	<b>Std. Error</b>	<b>Standardized β</b>	<b>t</b>	<b>Sig.</b>
Flexibility of composition	,235	,054	,389	4,325	,000
Variety of composition	-,020	,079	-,023	-,255	,799
Flavor of the products	,079	,092	,088	,853	,396
Freshness of the products	,394	,117	,337	3,373	,001
Precision of the service	,151	,068	,181	2,232	,028
Flexibility of delivery	,065	,055	,096	1,172	,244

<b>Model 3a</b>	<b>Tolerance</b>	<b>VIF</b>
Flexibility of composition	0,542	1,844
Variety of composition	0,550	1,819
Flavor of the products	0,409	2,445
Freshness of the products	0,440	2,275
Precision of the service	0,667	1,499
Flexibility of delivery	0,659	1,517

<b>Dimension</b>	<b>Eigenvalue</b>	<b>Condition Index</b>
1	6,810	1,000
2	0,068	10,009
3	0,054	11,211
4	0,027	15,978
5	0,021	18,086
6	0,015	21,670
7	0,006	34,494

**Appendix 12: Multicollinearity analysis of Model 3b (N=97) (DV: overall satisfaction)**

<b>Model 3b</b>	<b>Tolerance</b>	<b>VIF</b>
Flexibility of composition	,559	1,788
Variety of composition	,551	1,815
Freshness of the products	,826	1,211
Precision of the service	,669	1,495
Flexibility of delivery	,679	1,473

<b>Dimension</b>	<b>Eigenvalue</b>	<b>Condition Index</b>
1	5,832	1,000
2	,066	9,393
3	,051	10,667
4	,023	15,826
5	,018	17,989
6	,010	24,714

**Appendix 13: Multiple regression analysis of Model 3c (N=97) (DV: overall satisfaction)**

	<b>R</b>	<b>R<sup>2</sup></b>	<b>Adjusted R<sup>2</sup></b>	<b>F-value</b>	<b>df</b>	<b>Sig.</b>
<b>Model 3c</b>	,745	,556	,531	22,756	5	,000

<b>Model 3c</b>	<b>β</b>	<b>Std. Error</b>	<b>Standardized β</b>	<b>t</b>	<b>Sig.</b>
Flexibility of composition	,226	,057	,373	3,937	,000
Variety of composition	-,004	,083	-,004	-,047	,963
Flavor of the products	,292	,071	,327	4,104	,000
Precision of the service	,200	,070	,239	2,865	,005
Flexibility of delivery	,041	,058	,060	,706	,482

<b>Model 3c</b>	<b>Tolerance</b>	<b>VIF</b>
Flexibility of composition	,544	1,839
Variety of composition	,552	1,813
Flavor of the products	,769	1,301
Precision of the service	,699	1,431
Flexibility of delivery	,670	1,492

<b>Dimension</b>	<b>Eigenvalue</b>	<b>Condition Index</b>
1	5,828	1,000
2	,063	9,598
3	,048	10,970
4	,025	15,119
5	,020	16,902
6	,014	20,070

## References

- Anckar, B., Walden, P., & Jelassi, T. (2002). Creating customer value in online grocery shopping. *International Journal of Retail & Distribution Management*, 30(4), 211-220.
- Anderson, R. E., & Srinivasan, S. S. (2003). E-satisfaction and e-loyalty: A contingency framework. *Psychology & marketing*, 20(2), 123-138.
- Banco de Portugal. (2016). *Análise do setor agrícola 2011-2016*. (Statistical information note No. 123). Retrieved from [https://www.bportugal.pt/sites/default/files/anexos/documentos-relacionados/nie\\_estudo\\_11\\_2012.pdf](https://www.bportugal.pt/sites/default/files/anexos/documentos-relacionados/nie_estudo_11_2012.pdf)
- Barnham, C. (2015). Quantitative and qualitative research: perceptual foundations. *International Journal of Market Research*, 57(6), 837-854.
- Benn, Y., Webb, T. L., Chang, B. P., & Reidy, J. (2015). What information do consumers consider, and how do they look for it, when shopping for groceries online?. *Appetite*, 89, 265-273.
- Bosona, T., Gebresenbet, G., Nordmark, I., & Ljungberg, D. (2011). Box-scheme based delivery system of locally produced organic food: Evaluation of logistics performance. *Journal of Service Science and Management*, 4(03), 357.
- Brown, E., Dury, S., & Holdsworth, M. (2009). Motivations of consumers that use local, organic fruit and vegetable box schemes in Central England and Southern France. *Appetite*, 53(2), 183-188.
- Chen, S. J., & Chang, T. Z. (2003). A descriptive model of online shopping process: some empirical results. *International Journal of Service Industry Management*, 14(5), 556-569.
- Chennamaneni, P. R., Echambadi, R., Hess, J. D., & Syam, N. (2016). Diagnosing harmful collinearity in moderated regressions: A roadmap. *International Journal of Research in Marketing*, 33(1), 172-182
- Chittock, M. (2013, April 5). Organic box schemes are growing – but are they still the ethical option?. *The Guardian*. Retrieved from

<https://www.theguardian.com/lifeandstyle/wordofmouth/2013/apr/05/organic-box-schemes-growing-are-they-ethical>

- Cho, Y. C. (2010). Assessing Customer Satisfaction And Acceptance On Perishable Goods In the " Telepresent" Environments. *Journal of Business & Economics Research*, 8(9), 23.
- Cho, Y. C. (2011). Analyzing online customer dissatisfaction toward perishable goods. *Journal of Business Research*, 64(11), 1245-1250.
- Cho, Y., & Ha, J. (2011). Consumer choice behavior on the web: The effects of product attributes on willingness to purchase. *Journal of Business & Economics Research (JBER)*, 2(10).
- Chu, J., Arce-Urriza, M., Cebollada-Calvo, J. J., & Chintagunta, P. K. (2010). An empirical analysis of shopping behavior across online and offline channels for grocery products: the moderating effects of household and product characteristics. *Journal of Interactive Marketing*, 24(4), 251-268.
- Cicia, G., Cembalo, L., & Giudice, T. D. (2010). Consumer preferences and customer satisfaction analysis: A new method proposal. *Journal of Food Products Marketing*, 17(1), 79-90.
- Craney, T. A., & Surles, J. G. (2002). Model-dependent variance inflation factor cutoff values. *Quality Engineering*, 14(3), 391-403.
- Davis, S. W., Haws, K. L., & Redden, J. P. (2016). " Is This Food Healthy?": The Contextual Influence of Prior Foods on Healthiness Perceptions. *Journal of Marketing Behavior*, 2(1), 1-17.
- De Figueiredo, J. M. (2000). Finding sustainable profitability in electronic commerce. *Sloan Management Review*, 41(4), 41.
- Degeratu, A. M., Rangaswamy, A., & Wu, J. (2000). Consumer choice behavior in online and traditional supermarkets: The effects of brand name, price, and other search attributes. *International Journal of research in Marketing*, 17(1), 55-78.

- Dohm, A. (2005, March). Farming in the 21st century: A modern business in a modern world. *Occupational Outlook Quarterly*, 18-25. Retrieved from <https://www.bls.gov/careeroutlook/2005/spring/art02.pdf>
- Forsythe, S. M., & Shi, B. (2003). Consumer patronage and risk perceptions in Internet shopping. *Journal of Business research*, 56(11), 867-875.
- Grewal, D., Iyer, G. R., & Levy, M. (2004). Internet retailing: enablers, limiters and market consequences. *Journal of Business Research*, 57(7), 703-713.
- Hair, J. F., Black, W. C., Anderson, R. E., & Tatham, R. L. (1998). *Multivariate data analysis* (5th ed.). London: Prentice Hall
- Hair, J. F., Anderson, R. E., Babin, B. J., & Black, W. C. (2010). *Multivariate data analysis* (7th ed.). London: Pearson Education
- Hand, C., Dall'Olmo Riley, F., Harris, P., Singh, J., & Rettie, R. (2009). Online grocery shopping: the influence of situational factors. *European Journal of Marketing*, 43(9/10), 1205-1219.
- Hansen, T. (2005). Consumer adoption of online grocery buying: a discriminant analysis. *International Journal of Retail & Distribution Management*, 33(2), 101-121.
- Hansen, T. (2006). Determinants of consumers' repeat online buying of groceries. *International Review of Retail, Distribution and Consumer Research*, 16(1), 93-114.
- Hinton, P. R., McMurray, I., Brownlow, C. & Cozens, B. (2004). *SPSS explained*. London. Routledge.
- Hollywood, L. E., Cuskelly, G. J., O'Brien, M., McConnon, A., Barnett, J., Raats, M. M., & Dean, M. (2013). Healthful grocery shopping. Perceptions and barriers. *Appetite*, 70, 119-126.
- Hultén, B. (2011). Sensory marketing: the multi-sensory brand-experience concept. *European Business Review*, 23(3), 256-273.

- Jackson, D. L., Gillaspay Jr, J. A., & Purc-Stephenson, R. (2009). Reporting practices in confirmatory factor analysis: an overview and some recommendations. *Psychological methods, 14*(1), 6.
- Kacen, J. J., Hess, J. D., & Chiang, W. Y. K. (2013). Bricks or clicks? Consumer attitudes toward traditional stores and online stores. *Global Economics and Management Review, 18*(1), 12-21.
- Kim, H. W., Xu, Y., & Gupta, S. (2012). Which is more important in Internet shopping, perceived price or trust?. *Electronic Commerce Research and Applications, 11*(3), 241-252.
- Koehler, J. (2017). Agronegócios: *Acelerar a revolução agrícola no nosso país, por João Koehler*. Retrieved from <http://www.agronegocios.eu/noticias/acelerar-a-revolucao-agricola-no-nosso-pais-por-joao-koehler/>
- Krishna, A. (2012). An integrative review of sensory marketing: Engaging the senses to affect perception, judgment and behavior. *Journal of Consumer Psychology, 22*(3), 332-351.
- Magnusson, M. K., Arvola, A., Hursti, U. K. K., Åberg, L., & Sjöden, P. O. (2003). Choice of organic foods is related to perceived consequences for human health and to environmentally friendly behaviour. *Appetite, 40*(2), 109-117.
- Mansfield, E. R., & Helms, B. P. (1982). Detecting multicollinearity. *The American Statistician, 36*(3a), 158-160.
- Marketeer. (2017). *Continente lança cabazes de frescos*. Retrieved from <http://marketeer.pt/2017/01/30/continente-lanca-cabazes-de-frescos/>
- Moreira, A. C., Fortes, N., & Santiago, R. (2017). Influence of sensory stimuli on brand experience, brand equity and purchase intention. *Journal of Business Economics and Management, 18*(1), 68-83.
- Morganosky, M. A., & Cude, B. J. (2000). Consumer response to online grocery shopping. *International Journal of Retail & Distribution Management, 28*(1), 17-26.
- Moorman, C. (1998). Market-level effects of information: Competitive responses and consumer dynamics. *Journal of Marketing Research, 82*-98.

- Mortimer, G., Fazal e Hasan, S., Andrews, L., & Martin, J. (2016). Online grocery shopping: the impact of shopping frequency on perceived risk. *The International Review of Retail, Distribution and Consumer Research*, 26(2), 202-223.
- Nielsen. (2016). *Produtos nacionais, a primeira escolha dos portugueses?*. Retrieved from <http://www.nielsen.com/pt/pt/press-room/2016/nielsen-produtos-nacionais-vs-marcas-globais.html>
- Nielsen (2017). *Consumidores portugueses aderem às compras online*. Retrieved from <http://www.nielsen.com/pt/pt/press-room/2017/portuguese-consumers-join-online-shopping.html>
- O'brien, R. M. (2007). A caution regarding rules of thumb for variance inflation factors. *Quality & Quantity*, 41(5), 673-690.
- Oliver, R. L. (1980). A cognitive model of the antecedents and consequences of satisfaction decisions. *Journal of marketing research*, 460-469.
- Oliver, R. L. (1999). Whence consumer loyalty?. *the Journal of Marketing*, 33-44.
- Parsons, A., & Conroy, D. (2006). Sensory stimuli and e-tailers. *Journal of Consumer Behaviour*, 5(1), 69-81.
- Pozzi, A. (2012). Shopping cost and brand exploration in online grocery. *American Economic Journal: Microeconomics*, 4(3), 96-120.
- Portugal Sou Eu. (n.d.). Portugal Sou Eu: *Objetivos*. Retrieved from <http://portugalsoueu.pt/portugal-sou-eu>
- Quinta do Arneiro. (2009). *Quinta do Arneiro: Biológicos com amor*. Retrieved from <https://www.quintadoarneiro.pt/cabazes-biologicos-de-entrega-ao-domicilio>
- Reinartz, W., & Kumar, V. (2002). The mismanagement of customer loyalty. *Harvard business review*, 80(7), 86-95.
- Sharps, M., & Robinson, E. (2016). Encouraging children to eat more fruit and vegetables: Health vs. descriptive social norm-based messages. *Appetite*, 100, 18-25.

- Silvey, S. D. (1969). Multicollinearity and imprecise estimation. *Journal of the Royal Statistical Society. Series B (Methodological)*, 539-552.
- Slavin, J. L., & Lloyd, B. (2012). Health benefits of fruits and vegetables. *Advances in Nutrition: An International Review Journal*, 3(4), 506-516.
- Srinivasan, S. S., Anderson, R., & Ponnaveolu, K. (2002). Customer loyalty in e-commerce: an exploration of its antecedents and consequences. *Journal of retailing*, 78(1), 41-50.
- Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. *International journal of medical education*, 2, 53.
- Thom, A., & Conradie, B. (2012). Urban Agriculture, Social Enterprise and Box Schemes in Cape Town.
- Tudoran, A., Olsen, S. O., & Dopico, D. C. (2009). The effect of health benefit information on consumers health value, attitudes and intentions. *Appetite*, 52(3), 568-579.
- Uncovská, J., & Ulcák, Z. (2015). Organic box schemes: fashion or downshifting?. *Poljoprivreda i Sumarstvo*, 61(1), 59.
- Verhoef, P. C., & Langerak, F. (2001). Possible determinants of consumers' adoption of electronic grocery shopping in the Netherlands. *Journal of Retailing and Consumer Services*, 8(5), 275-285.