



Academic year 2017-2018

# UNDERSTANDING THE ROLE OF THE GEOGRAPHICAL LOCATION OF FOOD RETAILERS ON FOOD PURCHASING PRACTICES IN THE CITY OF RENNES, FRANCE: AN INTERPRETIVE APPROACH

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This thesis submitted in partial fulfilment of the requirements for the joint academic degree of International Master of Science in Rural Development from Ghent University (Belgium), Agrocampus Ouest (France), Humboldt University of Berlin (Germany), Slovak University of Agriculture in Nitra (Slovakia), University of Pisa (Italy) and University of Córdoba (Spain) in collaboration with Can Tho University (Vietnam), China Agricultural University (China), Escuela Superior Politécnica del Litoral (Ecuador), Nanjing Agricultural University (China), University of Agricultural Science Bengaluru (India), University of Pretoria (South-Africa) and University of Arkansas (United States of America)



Co-funded by the  
Erasmus+ Programme  
of the European Union





This thesis was elaborated and defended at Agrocampus Ovest within the framework of the European Erasmus Mundus Joint Master Degree “International Master of Science in Rural Development” (Course N° 2015 - 1700 / 001 - 001)

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## **Abstract**

The growing number of people living in urban areas became an overarching concern in terms of urban food security and nutrition. A food systems approach to this topic sustains that food systems play a central role in improving diet quality. They comprise three main elements: food supply chains, food environments and consumer behavior, with diets as the outcome (HLPE, 2017; GloPan, 2016). The food environment element is recognized as an enabler of consumer choices, particularly in facilitating sustainable, nutritious and healthy food choices (HLPE, 2017). The central theme of this master thesis is the role of the physical dimension of the food environment: food availability and physical access to food. The spatial location of the food commercial retailers is a key aspect of this theme. This master thesis aims at investigating the role of this geography of food retailers on food purchasing practices in the city of Rennes. To that purpose, a qualitative research design was adopted. Firstly, a territory of study was defined and categorized according to the food supply available. Secondly, twenty semi-structured interviews were carried out with consumers living in the selected study area. Consumers practices were analyzed based on the main thematic axes and factors that articulate with the spatiality. A set of issues emerged as constraints on consumers' practices and four ideal types of consumer behavior in response to geographical constraints were outlined. Our results suggest that there the food purchasing practices are partially explained by the constraints linked to the spatial distribution of the food retail environment. The results of this master thesis can contribute to a better understanding of how consumers perceive and interact with the commercial food environment of Rennes. They can also be used to enhance current and future policies for the city.

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# 1. Introduction

## 1.1 Study background

Accessibility to food in urban areas is becoming an overarching concern for the cities. A food systems approach to urban food and nutrition security is one of the possible approaches to assess the main challenges of food systems and to build far-reaching solutions to tackle these challenges. The HLPE conceptual framework of food systems for diets and nutrition sets the background for this discussion (HLPE, 2017). The food environment is a central element of this framework, as it represents the interface between the supply system and the consumer. The physical dimension of the food environment is believed to influence consumers food behavior. The lack of availability of a given food affects dietary choices (Herforth & Ahmed, 2015). Studies that have examined the role of food availability in shaping dietary intake have found a consistent positive relationship between the availability of healthy food and its consumption (Caspi et al., 2012). Many factors determine how people interact with the food environment, that is, how consumers behave *vis-à-vis* the existing food environment. The social diversity of food consumption is the result of the combination of several factors (Régnier et al., 2006) that determine food-related preferences and are linked to socio-cultural and lifestyle aspects (culinary tradition, age, education, revenue, household composition, etc).

The physical access to food is related to the built environment, of which the food retail environment is part. The lack of food retailers in some regions led to the definition of the food deserts, areas with limited access to food, and particularly healthy food (Apparicio et al., 2007). These areas have been documented in different countries and an extensive body of research have assessed the impacts of a restricted physical access to food. Common measures used are the density of food retailers in a specific geographic area and the distance of residences from stores. Part of the research also tried to measure the exposure of consumers to different food retail environments, going beyond the place-based approach that only considers fixed-anchor points to an activity spaces approach (Kestens et al., 2010). Other studies measured the impact of the perception of the food environment as a mediator of the socioeconomic variation of food consumption and consequently on diets (Inglis et al., 2008).

Food planning was only recently included in the cities policy-making and urban planning agendas (Dubbeling et al., 2017). Food is a central topic for policy-making in Rennes. The city of Rennes, together with the metropolitan area of Rennes, called Rennes Métropole, is one of the

signatory cities of the Milan Urban Food Policy Pact and has launched a sustainable food plan<sup>1</sup> in 2017. This research also hopes to contribute with insights and ways forwards for the development of public cities in the city.

## 1.2 Study purpose

The goal of this master thesis is to assess the role of the spatial distribution of the food retailers, including the so-called sustainable products, available in the surroundings of consumers' home, workplace and transit routes, in determining their food shopping practices. The main research questions that this research is expected to address are therefore the following:

- Which role does the geographical location of food retailers play on influencing consumer behavior? Is it a key determinant and does it determine the bounds of the food shopping practices?
- How do consumers seize the food retail provision and which strategies do they use in response to the spatial constraints imposed by the food retail environment?
- How does the spatial location of the food retail outlets articulate with other factors determining consumer food behavior?

Our main hypothesis is that **the consumer is free of choice to the extent of the food that is on offer in his territory of life and to the extent of his space and time constraints**: the spatial distribution of the food retailers determines his food-related practices, subject to his daily time-space context. Therefore, when the food retail provision is diversified in the daily space-time the consumer inhabits, he has free food choice and the geography of the food retailers does not interfere with his food shopping practices. **If the food retail environment is restricted, he has restricted choices**. In this case, there are two possible strategies: to do a sacrifice concerning food due to the restricted food options; or to do an extension of his time-space by means of an effort, which incurs in a time and financial cost.

The other hypotheses are:

- The spatial location of the food retail outlets around home plays an important role in determining consumers food shopping practices.
- The spatial location of the food retail outlets around the workplace plays an important role in determining consumers food shopping practices.

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<sup>1</sup> The *Plan Alimentaire Durable* (PAD) aims at reaching a 40% of food procurement for collective catering sourcing products produced in a "virtuous" way (of which 20% of organic products) by 2020. It also has the goal to reduce food waste by 50%.

- The spatial location of the food retail outlets around the transit routes plays an important role influencing the food shopping practices.
- If the food retail provision available in people's territory of life is perceived as inadequate, people develop strategies to procure food otherwise and/or elsewhere, which incurs in an effort. Individual factors and socio-cultural norms and values explain the efforts carried out.

### 1.3 Thesis organization

This master thesis is organized as follows. Chapter 2 reviews the literature and presents the concepts of food systems, food environments and availability and physical access to food and discusses the spatial distribution of food retailers in cities, providing a theoretical background to the research. Chapter 3 details the research methods used to conduct the study. Chapter 4 presents the results of the study and the ideal types developed, reflects on the hypothesis and discusses the study limitations and policy implications. Finally, Chapter 5 corresponds to the conclusions of the study.

## 2. Literature Review

### 2.1 The challenge of feeding a growing urban population

In 2014, 54% of the world population were living in urban areas. In the same year, the percentage of people residing in urban areas was respectively 74% and 79% in Europe and France. Projections expect that, in France, this proportion will surpass 80% by 2020 (United Nations, 2014). By 2050, the United Nations population projections and estimates indicate that 66% of the world population will be urban.

The growing number of city dwellers became an overarching concern in terms of urban food and nutrition security. Most of the world's food demand comes from urban areas, that is able to supply only a small part of the demand. Besides, urbanization is leading to an important loss of agricultural areas (Krausz et al., 2013). In the last decades, globalization led to the standardization of a conventional industrial model of food supply that delinked food production, processing and consumption (Renting et al., 2003). Nearly 75% of the world's food supply are controlled by the agri-food industry (Krausz et al., 2013). The composition of the national food supplies became less diverse (Khoury et al., 2014 apud Herfoth & Ahmed, 2015) and largely similar (HLPE, 2017). Agriculture and food systems were profoundly transformed due to other factors as well, like trade liberalization and changes in people's incomes and lifestyles. The increasing and evolving urban dietary requirements will continue intensely shaping these transformations (HLPE, 2017). Cities are, hence, embedded in these global food chains, that rely on a decreasing number of actors to supply the growing food demand (Jennings et al., 2015). In addition to food and nutrition security, challenges such as climate change, urban poverty, pressure on natural resources (Dubbeling et al., 2017; HLPE, 2017) and food prices volatility (FAO & RUAFF, 2015) were factors that led cities to overhaul their role in the food systems.

### 2.2 A food systems approach to nutrition and food security of urban areas

The studies of food systems gained force due to their link with the worldwide problem of malnutrition, as they play a fundamental role in improving diet quality (GloPan, 2016). Malnutrition has multiple forms and is growing not exclusively in low and middle-income countries, but also in high-income ones, despite the evolution of the global food systems. It became a burden for many nations and cities because of the health costs that it incurs (GloPan, 2016). Examples of major public health concerns are overweight and obesity, that are associated with the increase of non-communicable diseases such as Type 2 diabetes, some types of cancer and cardiovascular diseases (GloPan, 2017). It is why the Global Panel on Agriculture and Food

Systems for Nutrition defines a high-quality diet as one that, besides being safe and eliminating hunger, decreases all forms of malnutrition and promotes health (GloPan, 2016). Diets and the food people have access to are important elements of the debate on how to tackle malnutrition.

The High Level Panel of Experts on Food Security and Nutrition (HLPE) Report on Nutrition and Food Systems (HLPE, 2017) explored the impact of food systems on people's dietary standards and nutritional status through a conceptual framework (Figure 1) that recognizes three elements defining food systems: food supply chains, food environments and consumer behavior. All its elements, actors and drivers are interconnected and connected to other systems, such as the transportation, energy and health systems. Food systems are complex and go through constant adaptation and rapid renewal (HLPE, 2017; GloPan, 2016). According to the framework proposed by HLPE, illustrated in Figure 1, the food environment element takes a central part in enabling consumer choices, particularly in facilitating sustainable, nutritious and healthy food choices, thus diets are the primary link between food systems and their nutrition and health outcomes.

The food supply chain relates to all actors and activities involved throughout the whole chain, from the production to consumption and final disposal of waste, in the following subsystems: production; storage and distribution; processing and packaging; retail and markets (HLPE, 2017). Throughout each stage, the nutritional value of food can be maintained or improved (e.g. storage of perishable products, biofortification, less sodium) or it can be diminished (e.g. contamination, more transfat). This framework was built from another conceptual framework (Figure 2) proposed by the Global Panel on Agriculture and Food Systems for Nutrition (GloPan, 2016), that termed the supply element as food supply system, equivalent to what is commonly called as the food supply chain or food value chain, which corresponds to four subsystems: agricultural production subsystem; food storage, transport and trade; food transformation; food retail and provisioning. As already detailed in the framework by HLPE (2017) in Figure 1, we see the food environment as the interface between the supply system and the consumer. Several aspects are involved in the choice of what people effectively eat, as it will be discussed further. In the framework by GloPan (2016), preferences, time, knowledge and purchasing power are cited as the main domains encompassing the key factors determining in these choices.

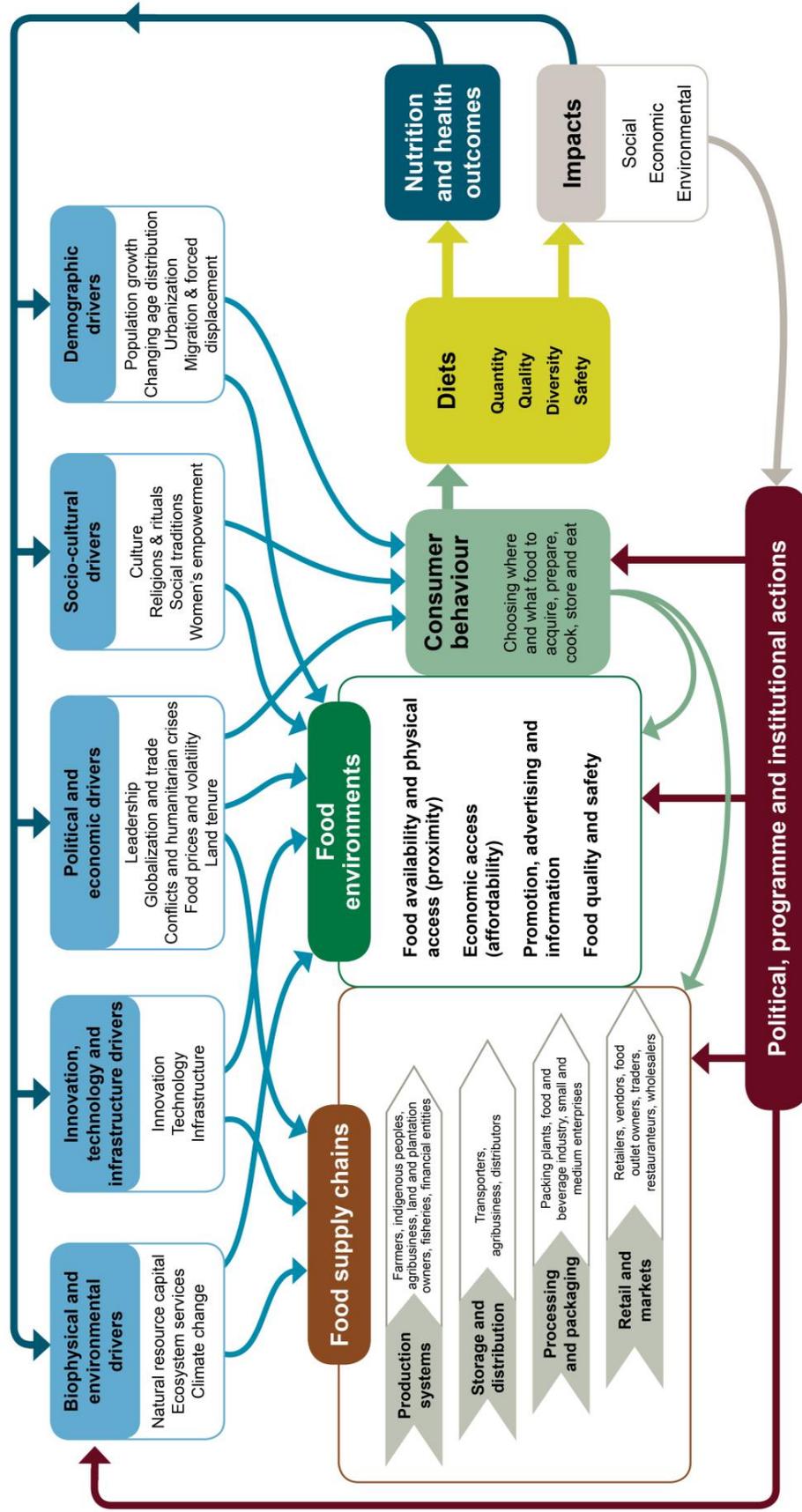


Figure 1. Conceptual framework of food systems for diets and nutrition. Source: HILPE (2017)

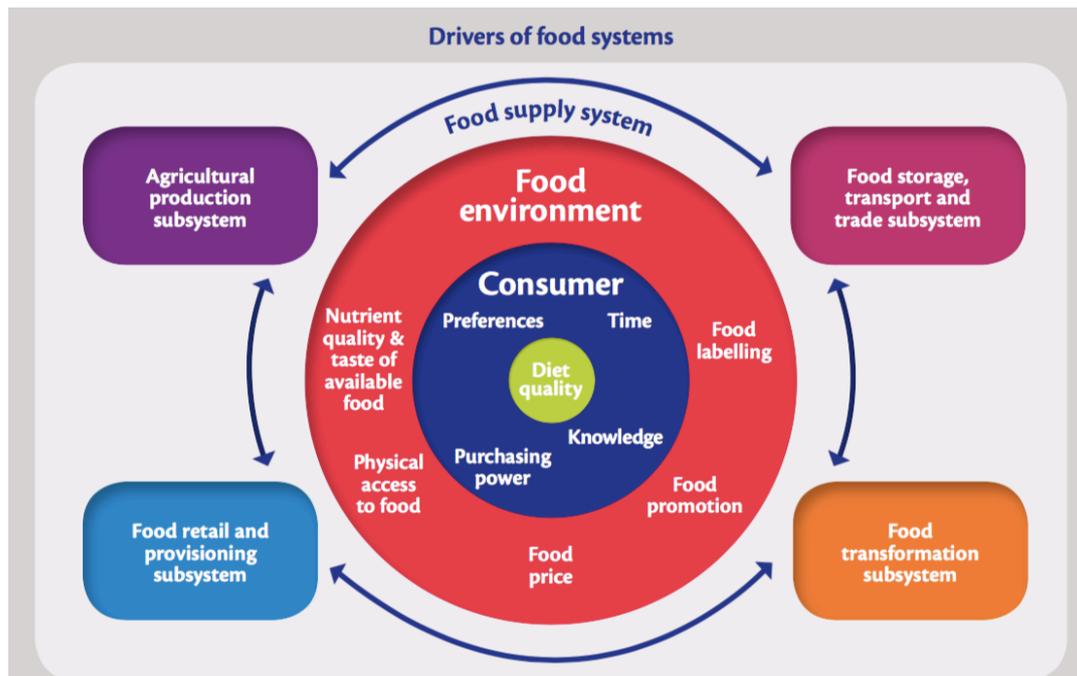


Figure 2. Conceptual framework for the links between diet quality and food systems. Source: GloPan (2016)

### 2.2.1 The food environments

The notion of food environments refers to the physical, economic, political and socio-cultural surroundings, conditions and opportunities that will influence people's decisions about how to acquire, prepare and consume food, that is their food choices, preferences and nutritional status (Vandevijvere & Swinburn, 2014; GloPan, 2017; HLPE, 2017). The context created by these four main dimensions corresponds to the interface between consumers and the wider food system (HLPE, 2017). These dimensions comprise many key elements: availability, physical access, economic access, promotion, advertising, information, desirability, food quality, safety and taste, among others (GloPan, 2017; HLPE, 2017). The economic access, also defined as the affordability, is the ability to pay for the food (Guy & David, 2004), which has a monetary cost. Food cannot be purchased if they cannot be afforded, or if consumers' purchasing power cannot respond to the food prices of a specific food environment.

This element is particularly important when it comes to the affordability of healthy diets. Even though it varies from region to region, a number of researchers have reported that the cost of healthy diets is superior to the cost of unhealthy diets in many parts of the world (Herforth & Ahmed, 2015). A review of the global literature on the disparities of cost between healthy and unhealthy diets by Darmon & Drewnowski (2015), mainly among lower-income groups, found that energy-dense foods, such as foodstuffs made of fats, added sugars and refined grains are cheaper than nutrient-dense foods, such as fruits and vegetables. The authors also concluded that

the food prices have an impact on diet quality, being one of the socioeconomic determinants of health. In other words, the socioeconomic discrepancies in diet quality can be explained by, among other factors, the higher cost of healthy diets. The economic cannot therefore be placed in the background when we reflect on the food environment. On the contrary, it pervades every aspect of the food environment discussion.

### 2.2.3 Availability and physical access to food

The food environment is an important link between food supply chains and consumer behavior. It is a core constituent of the supply chain framework proposed by GloPan (2016). The physical dimension of the food environment refers mainly to the availability and physical access to food.

A certain kind of food cannot be consumed if it is not available at all (Herforth & Ahmed, 2015). In recent literature, both elements were simultaneously described as accessibility to food. In the literature reviewed, a number of researchers described accessibility to food as a measure of the availability of food retailers in a certain area. The access to food was often estimated through measures of proximity such as the distance of food outlets to people's residences, with supermarket accessibility as a common criterion of the quality of the food environment.

The physical access to food is therefore dependent on the built environment, that is, the existence food entry points and a satisfactory infrastructure to access them (HLPE, 2017). The food retail environment is an important part of this built environment, as it includes the food retail outlets where people can purchase food. Other sources of food can also be considered as entry points (a community garden, for instance). In this master thesis, we apply the term food retail environment as a synonym of the entry points where people can purchase food, and more specifically food for home preparation and cooking. Out of home food options, such as restaurants, delivery and take-away, will not be included in this study.

The interaction of consumers with the build food environment depends on several factors, such as means of transportation, distance to food retailers, health and disability conditions of people, time available, equipment to cook and kitchen facilities, knowledge and cooking skills, purchasing power, etc. (HLPE, 2017).

#### 2.2.3.1 *The role of convenience*

Herforth & Ahmed (2015) include the desirability of various foods and convenience as important elements besides availability and affordability. They argue that desirability does not correspond to people's food preferences per se, but to all the external factors of the food

environment that will influence these preferences, such as advertising, quality and sensory properties of the food (taste, aroma, visual appeal, etc.) and campaigns that create knowledge and interfere in people's habits and norms. Convenience is directly related to time cost. In situations where time is limited, it can be more relevant than the monetary cost (Herforth & Ahmed, 2015). Convenience is directly linked to proximity and mobility, this last being a vector of exposure to geographic environments (Chaix et al., 2012).

Multiple factors are encompassed by convenience: time dedicated to work vs time spent in household chores such as food preparation; knowledge and skills to prepare food; kitchen facilities and equipment at disposal to cook; sufficient space and adequate conditions to store food at home; means of mobility to reach food retailers, among others. The food shopping practices are configured in a specific space-time context that is closely related to people's specific daily routines. Studies showed that convenience is very relevant in both low-income and high-income settings (Herforth & Ahmed, 2015). Hayn (2009) argues that there is an increased pressure on the way people organize their routines due to economic and social changes society is going through. This pressure is complexifying people's daily lives. Time-cost is therefore a central factor that makes convenience to be determinant of household food-related practices.

#### 2.2.4 Consumer behavior and diets

Consumer behavior towards food is a consequence of all choices and decisions people make from what and where to purchase to how to prepare, cook, store and eat (HLPE, 2017). Individual dietary choices and patterns are complex, impacted by a myriad of domains and factors. In a dynamic process, several personal and interpersonal factors determine this behavior, such as social norms, values, traditions and beliefs (HLPE, 2017). Diets include the quantity, type and quality of the foods that are regularly consumed and give shape to people's dietary patterns (HLPE, 2017). They have a symbolic value in human societies as they are part of the development of personal and social identities. Consumer socio-economic characteristics and incomes also play a role, as well as food skills and literacy. Because people eat the food produced by the food system, they influence what the system produces (GloPan, 2016) and diets and their outcomes (nutrition and health, for instance) can be a driver of change for future food systems (HLPE, 2017).

In a bidirectional process, the upstream food systems mold behavior and ultimately people's diets, as represented in the conceptual framework of Figure 1: they influence what consumers decide to acquire and eat and, therefore, their diet quality. This is because they shape what can be termed 'food environments' – the foods available to people in their surroundings as they go about their everyday lives and the nutritional quality, safety, price, convenience and

promotion of these foods. Food environments play an important role in shaping diets because they provide the choices from which people make decisions about what to eat; they constrain and signal what people can acquire and, as a consequence, impact the decisions people make. Food environments circumscribe how income can be spent on food” (GloPan, 2016, pg 83).

Nutrition and health will be the outcomes of diets. In its social ecological framework for nutrition and physical activity decisions (Figure 3), the USDA (2010 apud Herforth and Ahmed, 2015) further illustrate how individual, environmental and social factors interact and explain different diet behaviors. Individual factors (psychosocial factors, knowledge and skills, demographic factors like age, gender, socioeconomic status, race/ethnicity, ...) are placed within environmental settings which are influenced by different sectors (governments, public health systems, agriculture, industry, ...) and set within social and cultural norms and values (religion, lifestyle, heritage, belief system, ...).

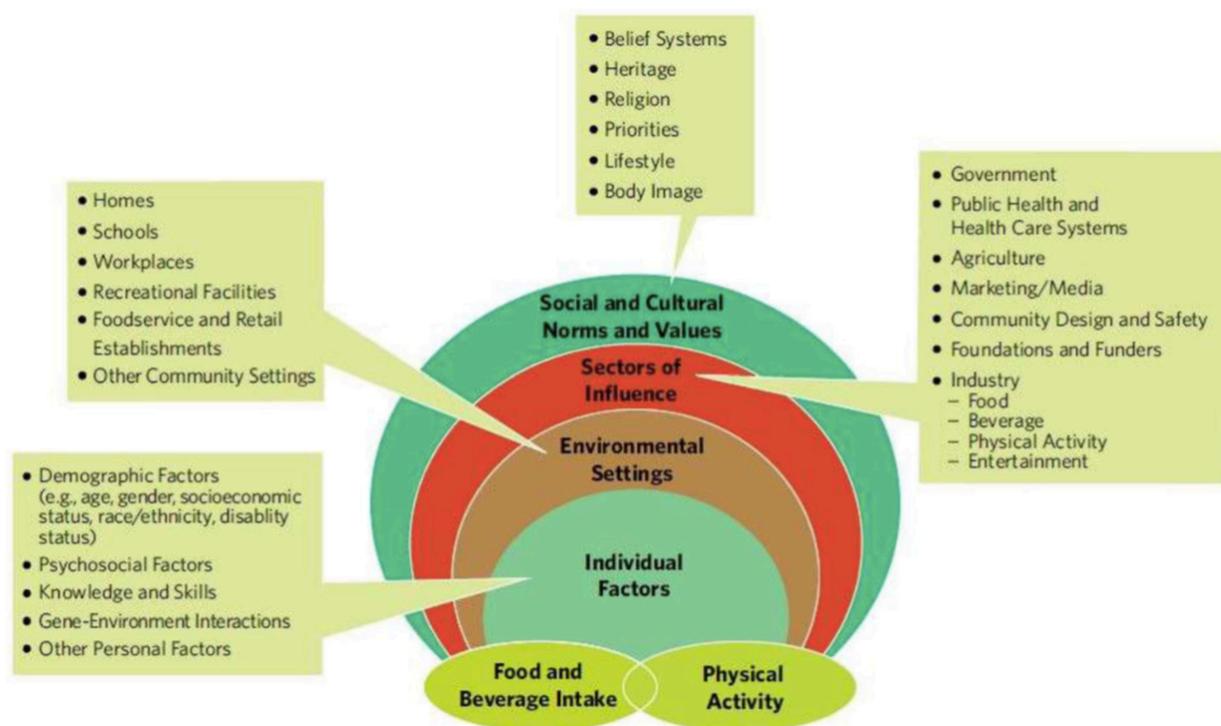


Figure 3. Social ecological framework for nutrition and physical activity decisions  
Source: USDA Dietary Guidelines for Americans (2010 apud Herforth & Ahmed, 2015)

Furthermore, Herforth & Ahmed (2015) affirm that income has a variable impact on nutrition, which is explained by the food environments. They interfere on how income can possibly be spent and is likely to be spent on food. While income can have a strong positive impact if the food environments enable healthy diets, an income increase “may worsen nutrition in some

ways when food environments facilitate spending toward unhealthy diets” (Herforth & Ahmed, 2015, p. 507). Environmental barriers to healthy eating are therefore central in the malnutrition debate.

In the contemporary urbanizing world, cities are in the heart of this debate as food became a critical issue for urban citizens. The food systems approach to nutrition and food security of urban areas provides a comprehensive conceptual framework which constitutes a solid background for the understanding of factors influencing people’s food-related practices and behavior. The notion of food environments, key to this approach, has a strong spatial dimension as it is linked to the geographical distribution of food – to its availability and physical accessibility.

### 2.2.5 The rise of alternative food supply chains

The mainstream food chains, which still prevail in the urbanized world, started to lose public trust due to the increasing society concern over ecology, animal welfare (Renting et al., 2003), health and food safety (Ilbery & Maye, 2005). Since the turn of the century, noteworthy attention has been given to the emergence of short food supply chains (SFSC) as alternative food networks in Europe.

The image of agriculture started to deteriorate in the 1980s after the beginning of food scandals such as salmonella in eggs, bovine spongiform encephalopathy and dioxin residues in milk (Renting et al., 2003; Goodman & Goodman, 2009), which aggravated in the early 2000s with the foot-and-mouth disease outbreak in Europe (Ilbery & Maye, 2005). All these episodes, as well as the advent of GMOs (Renting et al., 2003), reinforced the public concerns over the provenance and manipulation of food not solely in terms of production but also with regard to the whole supply chain (Marsden et al., 2000). Moreover, consumers inquietudes were translated into a resurgence of demand for food quality (Murdoch et al., 2000) and safety (Nygård & Storstad, 1998). For many years, food systems focused on producing quantity, but not on the quality of the food being produced (GloPan, 2016).

In industrial food chains it became difficult for the consumer to have a clear idea about the way food products have been produced and what the final product really contains (Lamine et al., 2012; Nygård & Storstad, 1998). Before food became an industrial product, the perception of food quality by consumers was essentially established by personal observations and social networks of producers and consumers in the region where the food was produced (Renting et al., 2003). The expansion of mass food markets drastically altered the food chains, changing the relationship between producer and consumer and also changing the food products, most of which started to be industrially processed and more difficult for consumers to recognize and control (Nygård &

Storstad, 1998). Food quality control began to be evaluated by an expert system based on objectified and measurable technical parameters and controlled by governmental or semi-governmental agencies (Renting et al., 2003). For many decades, this institutionalized and formal regulation of food markets received broad social support in Europe. But the scenario changes previously described led to the loss of consumers' unconditional confidence and trust in this expert system (Renting et al., 2003). Furthermore, the standardized and objectified quality criteria started to be questioned and challenged by a large part of consumers who are increasingly concerned about the way food is being produced (Renting et al., 2003). The problems and negative consequences of the industrial food chains have become apparent (Murdoch et al., 2000) and many farmers and consumers started to opt-out of the mainstream provisioning systems (Goodman & Goodman, 2009). Many authors have assessed how alternative food systems oppose to conventional chains (see Murdoch et al., 2000; Ilbery & Maye, 2005; Maréchal, 2008; Goodman & Goodman, 2009; Chiffolleau, 2012; Lamine et al., 2012; Renting et al., 2012). In this context, noteworthy attention has been given to the emergence of SFSC. Renting et al. (2003) say the SFSC concept is more specific than alternative food networks and chains and it rather encompasses the net of relations that exist among all actors of the food chain, from production to processing and distribution and finally to consumption of new products. Marsden et al. (2000) affirm that SFSC redefine the consumer-producer relation once the origin of food becomes more evident: they re-spatialize and re-socialize food as consumers make value-judgments regarding the food they desire to consume, and these judgments are based on personal experience, knowledge and perceived imagery. Participation of the civil society is a structuring element of these chains.

The interest in healthier, more natural and local food paves the way for alternative food supply chains that are potentially able to “short circuit the long, complex and rationally organized chains” (Marsden et al., 2000, pg 424). France took the lead and several initiatives are burgeoning in the country, where the Ministry of Agriculture defined SFSC as chains where there should be zero or no more than one intermediary (Chiffolleau, 2012). Chiffolleau (2012) stresses the central place that the social link occupies in the short chains. A Results of a study of the short food supply chains of Rennes Métropole, in France, concluded that the main motivations of consumers were the taste of food, the freshness of products and the contact with and producers and other consumers (Maréchal, 2008).

### 2.3 An unequal spatial distribution of food retailers: the food deserts

It was in the context of high-income economies that areas with absence or limited presence of food retailers started to be documented in the mid-1990s (Apparicio et al., 2007). This led to

the definition of a concept called food deserts, a geographic area with poor physical access to food shopping (Guy & David, 2004) and healthy food (Apparicio et al., 2007). The expression was first used in the early 1990s by a resident of a Scotland housing scheme when referring to a deprived neighborhood where the food environment was limited and expensive and, since then, the term has been referred to in several UK policy documents (Cummins & Macintyre, 2002). Additionally, the concept of food swamps emerged, or areas with a profusion of unhealthy food options (HLPE, 2017), normally high energy-dense processed foods, high in fat, sugar and sodium, usually poor in fibers and vitamins, that are known to be directly associated with weight gain and increased body mass index (Block et al., 2004) and poorer health outcomes (Walker et al., 2010). When summed up with limited opportunities for physical mobility, these environments are considered as obesogenic (Morgan & Sonnino, 2010).

There is an extensive literature on the food desert issue, especially in the USA (see Walker et al., 2010) and the UK. The development of food deserts is partially explained by the reorganization of the retail space. Cummins & Macintyre (2002) explain that in the late 1980s and early 1990s in the UK, invested in larger stores, which evolved to the relocation of these superstores to the edges of cities in a search for gains of scale. The direct impact was the decline in small and independent stores in the inner-city of many urban areas that would be later portrayed as food deserts. Among the postulates raised by researchers why food deserts are formed in the USA is the expansion of supermarkets on the fringes of cities, especially those belonging to large chains, offering better variety, quality and price for food options, longer opening hours and better parking options (Walker et al., 2010). In many cases, this forced grocery stores of the local neighborhood to close down, pushing the offer of fresh and varied food away, especially from those who do not have access to a car or have a restricted budget to spend on public transportation (Walker et al., 2010; Shannon, 2016). This is linked to the fact that in the 1970s and 1980s the so-called suburban areas attracted affluent households from the inner cities. First, zoning laws make it difficult for large supermarkets to settle in the central urban areas and financial gains are often lower (Walker et al., 2010). Besides, many chain supermarkets are reluctant to locate in certain neighborhoods, generally composed by lower-income ethnic populations, in a practice described as supermarket redlining by Eisenhauer (2001). The phenomenon of concentration of resources (schools, entertainment, farmer's markets, etc.) in affluent neighborhoods, income segregation and the increasing isolation of social groups from one another have actually been described in different fields of study (Jones & Pebley, 2014).

In France, the first large scale food retailers (*grandes surfaces*) were established in France in the end of the 1950s and beginning of the 1960s (1957 for the first supermarket and 1963 for the

first hypermarket) (INRA, 2010). The expansion of supermarket chains and other large food retailers (*grande distribution*) took place from the 1970s on. In 1970, hypermarkets corresponded to no more than 5% of the country's food sales, whereas in the last decade the total household food expenditure at the *grandes surfaces* reached 70%, in a strong process of concentration of the sales in supermarket chains (INRA, 2010). According to Humbert & Castel (2008), 90% of the cash and carry food retailing are operated by six companies. The share of small food retailers has consequently dropped. In France, they hypermarkets and hypermarkets have settled on the outskirts of cities.

### 2.3.1 Food democracy and food justice: towards an equal access to food

The observation of the unequal spatial and social distribution of the food retailers, embodied by the development of food deserts, and the increased lack of consumer trust in the mainstream food chains, manifested by the emergence of SFSC, are important elements of the background that raised the discussion about food democracy and food justice. The concept of food democracy was first used by Tim Lang in the 1990s, when pointing out that food systems were controlled by companies and excluded consumer participation and reiterating the central role of food in the democratic process (Renting et al., 2013). It was later defined by Hassanein (2003 apud Renting et al., 2013) as a situation where every actor who is part of the food system has an equal chance to participate in shaping it. Complementary to this concept, the notion of food justice also emerged as a critical standpoint of the mainstream food chains, but also of the alternative food chains, referring to the idea that there should be an equitable sharing of the risks and benefits linked to this food system, from the growing of the food to its consumption (Gottlieb & Joshi, 2010 apud Hochedez & Le Gall, 2016). There is a spatial dimension behind the notion of food justice: food injustice originates not only from social injustices but from spatial injustices (Slocum et al., 2011 apud Hochedez & Le Gall, 2016).

### 2.3.2 Food governance and the late inclusion of food in the urban planning agenda

Until recently, food planning was rarely included in the cities policy-making and urban planning agendas (Dubbeling et al., 2017). However, feeding the cities through sustainable food systems became a key driver of governmental and international action. Milestone initiatives at the

international level are the Milan Urban Food Policy Pact<sup>2</sup>, the Seoul Declaration<sup>3</sup> and the Food and Agriculture Organization's Food for the Cities Programme<sup>4</sup>, in coherence with the 10-Year Framework of Programmes on Sustainable Consumption and Production<sup>5</sup> (10YFP). City regions started therefore to be seen as an important territorial scale for food governance (Sonnino, 2009). This was one of the factors that prompted the interest in the concept of City Region Food Systems (CRFS) as an approach for policy-makers, local governments and other institutions concerning how to make informed decisions to improve the sustainability of urban food systems (Dubbeling et al., 2017). Local governmental action is under scrutiny.

New York State and City took the lead in developing urban food policies. They developed several strategies to promote the re-localization of the food supply chain, mainly focusing on public food procurement policies, especially in schools (Morgan & Sonnino, 2010) in response to the obesity epidemic. Increasing the availability and promoting the consumption of healthy food was one of the reasons to be of the New York State Council on Food Policy was formed, in 2007 (Morgan & Sonnino, 2010). Examples of initiatives led by New York City to increase the availability of fruits and vegetables in low-income neighborhoods were the Green Carts (licenses for vendors that sell fruits and vegetables), the Healthy Bodega Initiative (support to grocers to increase their sales of vegetables, fruit and low fat milk) and the FRESH (Food Retail Expansion to Support Health) programme (zoning and financial incentives to establish and retain grocery stores) (HLPE, 2017)

In France, cities and especially metropolitan regions are becoming more and more involved in urban planning and territorial development and governance. Even though food is still timidly present in projects of urban planning (Perrin & Soulard, 2014), it is gaining importance in the ongoing process of strengthening local agriculture and reconnecting producers and consumers. This led to the emergence of the notion of territorial food governance, defined by the Réseau Rural Français (French rural network) and Terres en Villes (French network of agricultural and food policy actors of urban agglomerations) in 2009 as the "a new ensemble of cooperation forms

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<sup>2</sup> Announced in February 2014, the international pact on urban food policies has the main goal of building equitable and sustainable food systems. It had been signed by 163 cities by March/2018.

<sup>3</sup> Signed by 96 mayors in April 2015 at the ICLEI World Congress, it's a call on cities and other stakeholders to encourage sustainable urban food production projects and resilient city region food system programs (FAO & RUAFA, 2015).

<sup>4</sup> The program provides assistance to local governments in identifying and understanding gaps, bottlenecks and opportunities for sustainable planning, informed decision-making, prioritizing investments, designing sustainable food policies and strategies to improve local food systems.

<sup>5</sup> The 10YFP is a global commitment to accelerate the shift towards sustainable consumption and production in both developed and developing countries. Sustainable consumption and production has been included as a stand-alone goal (SDG 12) of the 2030 Sustainable Development agenda, and Target 12.1 calls for the implementation of the 10YFP (UN Environment).

among different actors and administrative levels of geographical intervention, whose common arena is the food issue<sup>6</sup>”. For Krausz et al. (2013), this definition raises other complex questions, such as: who will organize the food supply chains at the territorial level? Someone has to bring the actors together, take structuring decisions, coordinate the cooperation initiatives and do the follow-up and corrections (Krausz et al., 2013). The authors argue that actors (city council, inter-communal bodies, region, chamber of agriculture, union of farmers, consumers associations, etc.) are segmented and have diverse and opposite logics, which represents of the central challenges of local food governance.

### 2.3.3 The impact of food deserts on public health

Following the diffusion of evidences of the presence of food deserts in the US urban landscape, various studies have been developed on the differences in the availability and accessibility to food and healthy food within cities and the consequent impact of food environments in terms of dietary outcomes and public health (see Block et al., 2004; Inagami et al., 2006; Thornton et al., 2012; Dubowitz et al., 2014; Vandevijvere & Swinburn, 2014). New York City is emblematic of these disparities: obesity rates in low-income minorities neighborhoods varied from 21% to 30%, while this proportion was around 9% in the wealthiest neighborhoods in 2006 (Gordon et al., 2011). Poverty does have a link with malnutrition. Residents of poorer neighborhoods have higher body mass index (BMI) and an unhealthier diet (Inagami et al., 2006). Likewise, studies showed that there are significantly higher rates of obesity and diabetes among the poorer and less educated (Morgan & Sonnino, 2010; Gordon et al., 2011).

Drewnowski & Darmon (2005) explain that obesity is a social and economic phenomenon. Higher rates are found among individuals with low education and low incomes, at the individual level, and in most deprived areas, at the environmental level. The food environment is a predominant driver of healthy diets (Gordon et al., 2011; Vandevijvere & Swinburn, 2014). Public health problems like obesity and other malnutrition problems should therefore be considered from a comprehensive standpoint. As Morgan & Sonnino (2010, p.210) conclude that “the powerful correlation with poverty means that obesity is not so much an urban problem per se as a problem of poor people in an obesogenic urban environment”.

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<sup>6</sup> Translation by the author. Original definition in France « la gouvernance alimentaire territoriale désigne un nouvel ensemble de coopérations entre les différents acteurs et les échelons d'intervention géographiques, dont l'arène commune est l'enjeu alimentaire ». Available from: [http://terresenvilles.org/wp-content/uploads/2016/11/TEV\\_CH3.2\\_DigestGouvAlimAgglo\\_2009.pdf](http://terresenvilles.org/wp-content/uploads/2016/11/TEV_CH3.2_DigestGouvAlimAgglo_2009.pdf).

## 2.4 Assessing the physical access to food

Several studies were done on the food retail environment, with a focus on the geospatial spatial distribution of food. They reached contrasting results for different countries and regions. In the USA, food deserts exist mainly in low-income and socially-deprived regions (Guy & David, 2004; Zenk et al., 2005; Gordon et al., 2011). A study in the metropolitan Detroit concluded that more impoverished neighborhoods have reduced access to supermarkets (Zenk et al., 2005). In average, socially-deprived neighborhoods were found to have 30% less supermarkets in the USA (Walker et al., 2010). In the city of Philadelphia, for instance, this percentage was around 156% (Weinberg, 1995 apud Walker et al. 2010). Impoverished neighborhoods were equally more exposed to fast food. A study by Block et al. (2004) found evidence, in the city of New Orleans, that individuals of low-income neighborhoods were more exposed to fast food when compared to those from high-income neighborhoods. The postulate that guides most research in the USA context is that supermarkets are positively associated with the availability of healthy food, that they normally offer a greater quality and variety of foods when compared to convenience and small grocery stores (Bader et al., 2010). Accessibility to supermarkets is seen as a proxy for access to healthy food (Zenk et al., 2005), being therefore an enabler of healthy diets (Burgoine & Monsivais, 2013).

Smith et al. (2010) argue that studies about the UK context were less univocal, with contrasting results about the spatial inequalities of food availability. While results corroborate the findings for the USA, Cummins & Macintyre (2002), for instance, conclude that minimal differences were found between affluent and deprived areas in Glasgow. In the Canadian context, a study by Apparicio et al. (2007), in Montréal, concluded that people living in low-income neighborhood were exposed to more food sources than the ones from high-income neighborhoods, contrasting with most of the results found in cities in the USA. The authors concluded therefore that food deserts are not a major concern in Montréal since there is sufficient accessibility to healthy food. Hence, studies evaluating food environments should be context specific, (Smith et al., 2010) thereby considering the particular socio-economic context of each city.

The availability of food is not spatially homogeneous within the cities. The levels of accessibility are not the same for all consumers. It is intrinsically linked to their ability to interrelate with the built environment available at a particular place at a certain point in time. Conceptually, the physical access to food is essentially linked to the presence of entry points in the food retail and provisioning system and adequate infrastructure that enables access to them, what is defined as the built environment (GloPan, 2016; HLPE, 2017) and corresponds to the physical component

of the food environment. Measuring its effects on consumers choices and, consequently, diet quality has been a major challenge in research (Moore et al., 2008).

The most common approach to assessing the food environment is therefore to study the physical accessibility of food retailers. It started to rise spurred by the outpouring research on food deserts, focusing on specific urban areas within cities. Many authors have been developing the use of Geographic Information Systems (GIS) in the studies of food environments (see Zenk et al., 2005; Apparicio et al., 2007; Bader et al., 2010; Smith et al., 2010; Thornton et al., 2012; Shannon, 2016). A commonly applied GIS-based measure of food environments is to calculate the density of food retailers within a certain area or radius of  $x$  meters (normally census tracts) and the distance to nearest food stores. This distance is commonly calculated between food stores and people's residences. Geocoding the food retailers allows the creation of electronic maps of the commercial food environment that can be confronted with other maps such as transportation maps. Apparicio et al. (2007) established three estimates of accessibility to supermarkets: proximity (distance to the nearest supermarket), diversity (number of supermarkets within 1 km) and variety in terms of food and prices (average distance to the three closest different chain-name supermarkets). Smith et al. (2010) investigated the grocery stores selling fresh fruit and vegetables and included an evaluation of the quality of the food supply measured with in-store visits.

#### 2.4.1 The activity spaces and the exposure to foodscapes

The majority of the studies of availability and physical access to food focused on what Kestens et al. (2010) call fixed anchor points like residential neighborhoods. Considering people's homes as the main references is a place-based approach that does not take into consideration the "complex and intertwined spatial, social and temporal dimensions involved in people-place interactions" (Kestens et al., 2010, pg 1094). People are routinely exposed to a larger geospatial context, that includes residence, workplace, school, place of worship, etc., or different activity spaces. In the notion of activity space, as described by Jones & Pebley (2014), besides people's home locations, other places that people routinely visit are considered, in a measurement of the individual use of the urban space. Burgoine & Monsivais (2013) argue that non-home environments are essential in having a far-reaching assessment of the foodscape exposure. The term foodscape, or "food landscape", can have different meanings according to the field of study. We adopt the definition that refers to the food environments, that is the geographies of food (location of food outlets) that people are exposed to and can interact with (Roe et al., 2016).

Activity spaces refer therefore to the portion of the environment that an individual uses to accomplish all his activities (home and out-of-home), which includes the locations of his activities

and the travel between them (Kestens et al., 2010). This larger context justifies the importance of the space-time geography. Kestens et al. (2010) used activity spaces to measure foodscape exposure. In this research, we can also use the term territory of life as a synonym to activity spaces.

Each person therefore experiences a different foodscape. However, measuring the individual use of the urban space is methodologically complex, involving intense data collection often through GPS monitoring and travel diaries (Jones & Pebley, 2014). Furthermore, the true geospatial context is very complex to be entirely captured by these methods. This might explain why research encompassing this complexity is nearly non-existent (Dubowitz et al., 2014).

#### 2.4.2 Mobility as a driver of accessibility

Capsi et al. (2012) argue that the notion of food accessibility should not be exclusively based on distance, but also on how difficult or easy it is for people to reach the food available. Mobility is thus a vector of exposure to the foodscape. It is normally composed of the available means of transportation, the distance to reach food retailers, the available time to purchase, among others. Vehicle ownership, for instance, can restrict consumers' access to a larger variety of food retailers (Thornton et al., 2012). Mobility is one of the determinants of convenience that, as described previously, is directly linked to time cost: when time is a scarce resource, convenience may be even more important than the dollar cost of food (Herforth & Ahmed, 2015). Moreover, mobility can facilitate or impede the access to the food that is available.

A growing body of research investigated daily mobility as a determinant factor of food accessibility, mainly in the field of public health (see Smith et al., 2010; Thornton et al., 2012; Burgoine & Monsivais, 2013; Shannon, 2016). Street network distance was a measure used by Smith et al. (2010), when calculating travel time between residential areas and the closest food stores, and Burgoine & Monsivais (2013), who evaluated people's exposure to different food environments while commuting by different travel modes (walk, cycle, car, public transport). Finally, in an innovative study in low-income neighborhoods of Minneapolis, Shannon (2016) obtained information on people's mobility and food shopping with the support of a GPS software installed on their phones, complemented with data from diaries of food procurement and interviews.

#### 2.4.3 The perceived food environment

Dubowitz et al. (2014) highlight that one of the ways through which the interaction of people with the food environment materializes (where, when and how) is through the food purchasing practices. In order to better apprehend this interaction and its impacts on dietary

outcomes, for instance, these researchers relied on quantitative methods that included interviews with the main food shopper of the households at multiple points in time, obtaining data on food purchasing practices and dietary intake. Nevertheless, it appears that comprehending the broader picture of foodscape exposure, and how people interact with it, is imperative to understanding its impacts on food purchasing practices. Some researchers studied how consumers perceive the food environment. Moore et al. (2008) compared GIS-based with perception-based measures (survey questions about the availability of healthy food) of the food environment, which are complementary, according to them, and more valid and reliable tools (Inglis et al., 2008). Moore et al. (2008) affirm that it is a challenge to develop trustworthy and valid methods to measure local food environment.

The study of Inglis et al. (2008) tested the hypothesis that the perception of the food environment – food availability, accessibility and affordability – mediates socioeconomic variation of healthy food and fast-food consumption among women of different socioeconomic positions in Melbourne. Based on data from surveys, the authors concluded that education level was significantly positively related to vegetable consumption, and that women who reported an abundance of healthy foods in their neighborhoods were less likely to be frequent fast-food eaters, confirming their initial hypothesis. According to the authors, this perceived food environment is one of the mediators of the socioeconomic differences in diet, even though associations are not causal and that other potential mediators such as knowledge, cooking skills and social norms are also mediator. Comparing people's perceptions of the food environment with the objective food environment is a worthwhile approach according to the authors.

Nikolli, Le Gall & Laval (2016) explore the notion of foodscape as an indicator of the diversity of perceptions of people about the local food environment. This is because this notion, defined varyingly among authors, refers not only to the physical scape seen by people, but it represents how people perceive and represent the existent food environments. Accordingly, the authors postulate the existence of foodscapes in opposition to a univocal foodscape. This approach goes beyond the common approach of food environments that considers the objective environment and the discussion about the physical access to food retailers: it accounts for the perception of people, confronting the environment that people are exposed to with the perceived environment.

#### 2.4.4 Critique on the food access approach

Shaw (2006) suggests improvements for the food deserts approach commonly used in research. This author proposes the development of a threefold classification of food deserts, that

is based on an across-the-board concept of “access” that considers three contributory factors to problems related to access to food: ability, asset and attitude problems. Ability problems relate to anything that physically prevents consumers to access to food. Asset problems relate to the financial assets that prevent access to food. Finally, the attitude problems relate to any state of mind that prevents consumers to access food. This classification would help to differentiate food deserts and to identify the crucial factors and problems that should be tackled, which is particularly important in the development of public policies to improve diets.

Rosenberg & Cohen (2018) criticize the narrative of food access and the larger context by which it was shaped. Among their critics is the fact that in politics, to improved access to food became almost a synonym of improved access to food retailers. In the case of the UK, this led the problem to be addressed almost exclusively with incentives for conventional food retailers, for instance via public-private partnerships to address market failures. These measures came in detriment of others like wealth redistribution and increase public spending that could tackle other factors limiting food access, like poverty, and were typical of the “Third Way” politics<sup>7</sup> implemented by Tony Blair in the 1990s (Rosenberg & Cohen, 2018). It is also in this context that citizens become consumers that are free from the state. Watts & al. (2005), referring to the work of Leyshon & Lee (2003), argue that through the neoliberal project individuals were transformed into “virtual” consumers around which societies are being remodeled. The notion of freedom is migrating from poverty and deprivation to freedom to make economic choices, but for those who can afford to do so. The third way politics gives continuity to this logic where responsible citizens are consumers that make reasonable choices: “responsible citizens make reasonable choices – and therefore ‘bad choices’ result from the wilfulness of irresponsible people, rather than the structural distribution of resources, capacities and opportunities” (Clarke, 2005, p 452).

Retail food access policies to improve health and dietary outcomes are criticized by Rosenberg & Cohen (2018). The factors explaining the raise of these interventions are the self-promotion by food retailers, the political appeal of supermarket development and analytical weaknesses. Referring to the last factor, the authors argue that, in policy-making, simple theories (like determining a causality between living near a supermarket and buying healthy food) can sometimes win over more complex ones that involves choice architecture, the intricacies of economic decision making and the complex and interlinked social practices that drive behavior. Also concerning the analytical weaknesses, Rosenberg & Cohen (2018) emphasize that

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<sup>7</sup> It is a concept referring to a political position between a right and a left, with centre-right economic policies and center-left social policies. Giddens (1998) was one of its main theorists. Source: <http://news.bbc.co.uk/2/hi/458626.stm>

interventions are more commonly downstream and do not address social and economic inequalities, and that they receive support because they adjust to the neoliberal ideologies: addressing the upstream, root causes of malnourishment, specially poverty, time constraints, stress and other factors, is much more complex and politically fraught” (p.1116).

## 3. Materials and methods

### 3.1 The study area

This research was part of the Frugal<sup>8</sup> research project (*Formes Urbaines et Gouvernance Alimentaire*), which analyzes the systematic issues of the food supply in the metropolitan areas of the Grand Ouest and Rhône-Alpes in France. Among its main goals are the integration of the food issue in public policies. The project aims at formulating principles of public action that consider the main challenges of urban food supply and their impact on the “urban metabolism” for a better urban food governance and resilience of metropolitan areas. Policy implications were discussed in the end of this thesis. The Frugal project is supported by Terres en Villes, an association of cities and territories that aims to promote the sustainable development of urban and peri-urban areas. The research presented in this master thesis was done in the city of Rennes. Rennes Métropole is one of the founding members of the Terres en Ville. Network. Located in the Grand Ouest, the city is the capital of the region of Bretagne, northwest France. Rennes is a reference for other cities in France as one of the pilot metropolises in terms of relocalisation of food.

Several projects and actions<sup>9</sup> are being developed in Rennes to encourage sustainable food production and consumption. Rennes Métropole and city have committed to the Milan Pact, with the central goal to consolidate territorial food systems. Since 2017, has been implementing its sustainable food plan (PAD), laureate of the call for proposals National Food Plan of the Ministry of Agriculture.

According to the document *Rennes Métropole Chiffres clé*<sup>10</sup> (2016), since 1990, the population has increased by more than 100.000 inhabitants, with an average annual growth of 1,4% since 2010. Rennes Metropole includes 43 municipalities in its perimeter. The populations of the city of Rennes, Rennes Métropole and the urban area of Rennes correspond to 216.400, 443.500 and 725.000 people in 2016, respectively. In France, the INSEE (National Institute of Statistics and Economic Studies) defines Urban areas are defined, based on home-work census data, as a group of touching municipalities, without pockets of clear land, made up of an urban center and its periphery where at least 40% of its employed residents work at the center or in the nearby municipalities. In Rennes, there are 12 neighborhoods or *quartiers*, which are divided in different IRIS<sup>11</sup>, which is the smallest geographical unit for which data are provided in France. It is an acronym defined by the INSEE as ‘aggregated units for statistical information’. It is a fundamental

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<sup>8</sup> <http://projetfrugal.fr>

<sup>9</sup> [https://www.audiar.org/sites/default/files/documents/observatoires/obs\\_eco\\_alimentation\\_web-v9-nlr.pdf](https://www.audiar.org/sites/default/files/documents/observatoires/obs_eco_alimentation_web-v9-nlr.pdf)

<sup>10</sup> [https://www.audiar.org/sites/default/files/documents/observatoires/web\\_2016chiffres\\_cles\\_rm.pdf](https://www.audiar.org/sites/default/files/documents/observatoires/web_2016chiffres_cles_rm.pdf)

<sup>11</sup> Ilots Regroupés pour l'Information Statistique

unit for dissemination of infra-municipal data (census tracts). The center of Rennes Métropole is composed of five municipalities that are interconnected with the surrounding ones in a model called “archipelago city”. Therefore, the center is highly urbanized and the urbanization extends to the surrounding “island cities”, where local services are provided.

The study focused on one geographical area that was selected in the city of Rennes (figure 4). The selection of the geographical area studied in Rennes was based on a pragmatic decision that involved the characteristics of the area and the ability of the researcher to reach the area. It was chosen to represent the larger food environment settings of the city.

We decided to do the research in the area previously studied by the project *Rennes Ville Vivrière 3* from 2013, a sociological study of food-related behavior (Darrot, 2014). The study focused on a defined geographical area in the North of Rennes, that includes a gradient of social classes from the center to the periphery of the city. The socio-economic diversity of this zone is believed to be representative of city-wide demographic factors. *Rennes Ville Vivrière* focused on the population responsible for the household food purchasing.

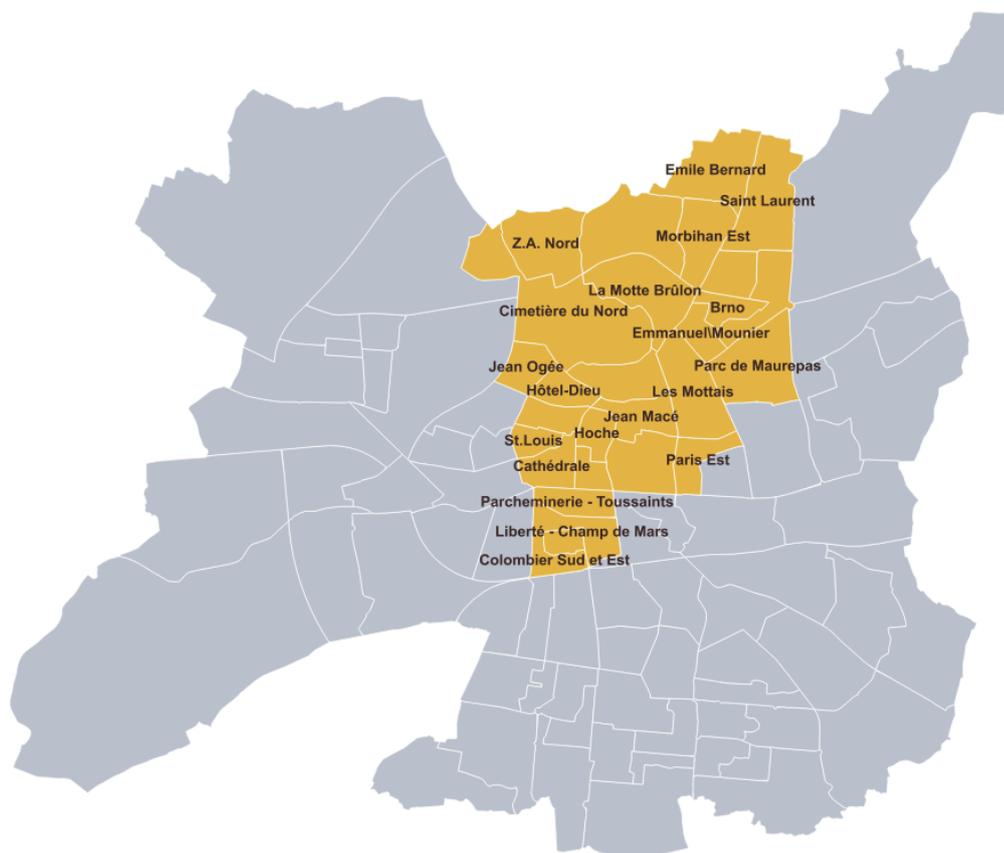


Figure 4. Breakdown of Rennes in IRIS and the study area. Source: author's own elaboration

## 3.2 Research methods

We used a **qualitative research approach** in this exploratory research in order to answer to the research questions and hypotheses. First, we characterized the geography of the food retailers available in the study area, in order to measure the food retail environment. Here all food entry points mapped were listed. This was the basis for the definition of the areas sampling. Besides, it provided objective measures of the food environment that were compared with the perception of consumers. Second, we used semi-directive interviews to collect data on consumers food purchasing practices.

### 3.2.1 The characterization of the food retail environment

**Secondary data** were used for this purpose and incremented with data collected directly by the student. The main source of data for the study was the cartographic atlas of the food offer developed by students of a workshop coordinated by H el ene Bailleul of Universit e Rennes II. This cartography included the food retailers of the urban area of Rennes.

L'INSEE defines retail businesses as those selling goods in the state in which they are purchased, or after minor processing, generally to private customers, regardless of the quantities sold. In our study, we focused on food retail outlets selling foodstuffs for home cooking. Out-of-home food retailers were not included in the study. As components of the food commercial environment, the following food retailers were considered: hypermarkets, supermarkets, discount supermarkets, mini-markets/grocery-stores, open air and covered markets, greengrocers, frozen food stores, farm-gate sales, farmer's baskets, bakeries, fishmonger's and butcher's.

The cartography used included the geographical distribution of food retail businesses (permanent and non-permanent, like farmer's market stalls), quantity and categories of food retailers per geographical unit and per 1000 habitants. The smallest geographical unit for which data on the food retailers were available for the city of Rennes was the IRIS

The databases used to obtain the geographic availability of food retailers were:

- The INSEE Sirene Database, which provides information on the French directory of active companies and establishments;
- OpenStreetMaps, that provides open data of companies and establishments, through a collaborative project where external contributors can permanently update and enrich the database. It is believed to be more updated and complete than the Sirene Database.
- Carte-OuVerte, a repertoire of initiatives that aim at reducing the ecological footprint, such as farm-gate sales, food markets and farmer's baskets.

The data were verified through online searches on Datafrance.info, Carte-ouverte.org, Marches35.fr, Bonplanbio.fr, OpenStreetMap.org, Google Maps and other websites such as company websites of the major food retailers and discounters.

The maps provided a first reference of the food availability in the regions in terms of quantity of food retail outlets available in Rennes in absolute terms and relative to the population. These data were the basis for the categorization of the territory in areas with similar characteristics.

### 3.2.2 Consumers' food shopping practices

We collected **primary data** on consumers food purchasing practices with semi-qualitative interviews done in the study area. We only interviewed those in charge of food purchasing and preparing and will consider only the food retail businesses selling foodstuffs for home cooking.

The interviewees were asked to describe the offer available in their territory of life, how they organize their food purchases, and which would be an ideal situation. An interview guide with a set of open-ended questions was developed for this purpose (annex 1). It was previously tested with three people in the territory of study.

In order to address the research questions and test the research hypothesis, we tried to comprehend the reasons why people spatialize their food purchases the way they do, which factors have influence on their decisions, the role of played by the spatial distribution of food retailers, how it articulates with other factors and how people perceive the food retail environment existent in their activity spaces (or territory of life).

We tried to allow the consumers to express themselves as freely as possible concerning different topics most of which they brought up spontaneously. During the interviews, the topics were approached openly to allow the consumer to express his point of view according to his own logic. The consumer's discourse was the guideline. We had to do an attentive listening and notes were taken. We had to guarantee probing was used when necessary. In some cases, we made use of follow-up questions to obtain further and deeper information. We wrote down key words followed by a question mark when the idea did not seem clear or developed enough.

#### 3.2.2.1 *The sampling procedure*

The categorization of the food retail environment of the study area was the basis of the sampling procedure of the interviews. We interviewed people living in IRIS with different characteristics. We tried to have a balanced composition of IRIS of residence among the interviewees: the goal was to have a diversity of IRIS of residence in terms of the food retail environment.

An *a posteriori* sampling of the interviews was done in order to reach a sufficient number of respondents. The saturation principle was respected: when we believed to have reached saturation, 10% of extra interviews were done. The theoretical saturation was reached when additional information capable of enriching the range of answers obtained was no longer found when a new interview was carried out. Generally, the data collection stops when the last observation units analyzed have not brought new elements (Thietart, 2003). The goal was not to have an exhaustive list of the situations we can find in Rennes. The main objective of the interviews was to investigate how people spatialize their food purchases in order to bring to the foreground general tendencies of food shopping practices in the study area.

After the definition of the geographic areas of residence of people who would be interviewed, we went to these areas in order to find people who would be willing to be interviewed. All areas were visited by bicycle, which allowed the researcher to explore the city and verify personally the location of the food retailers listed in the inventory.

From April to May 2018, people were approached randomly in the IRIS that were part of the study. We did not focus on a specific socio-demographic profile of people. We assumed that we would be able to compose a diverse sample approaching people randomly at different days of the week and at distinct times of the day. People were approached when walking on the streets or leaving and arriving in their homes in the territory of the study. The goal was to establish a first contact with people and to schedule an appointment for the interview. We made sure people lived in the area. Also, the purpose of the study was explained to the future interviewee. The anonymity of the interviewees was reinforced and a previous permission for note-taking and tape recording during the interview was asked.

In some of the IRIS included in the study, no one was willing to be interviewed. In fact, most people we spoke with did not accept to be interviewed. Even though some IRIS could not be represented in the sample, we tried to make sure our sample had a diversity of IRIS in terms of the available commercial offer.

An appointment was scheduled with those responding positively to the request, or their phone numbers were noted down for a subsequent contact after the consultation of their agendas. Some people confirmed their availability, scheduled an appointment but did not show up for the interview.

The interviews were carried out from the end of May to July 2018. Some of them took place at the residence of the interviewees, and other in public places such as parks and cafes, depending on people's preferences. We did not attempt to reach the full representativeness of the

study area, but rather a sample that recognizes patterns among the respondents' behaviors that are valid for the sample and a particular context.

In Rennes, a total of 20 people was interviewed in 14 different IRIS and one city located in the north of Rennes. All the interviews were tape-recorded and fully transcribed.

As the interviews were being done, the respondents were categorized depending on the food availability of their IRIS of residence. Even though the sample was not representative of the population of the urban areas of Rennes, which would require a very large number of respondents, the sample was positioned in relation to the available food offer of the predefined study areas.

### 3.3 Data analysis

The data collected during the interviews was analyzed based on an **interpretive approach**, as we are interested in understanding both the “real”, that we try to measure with quantitative and “objective” data, and the way people interpret this “real”, their representation of it. Through this confrontation, we try to objectify the subjective. This interpretative approach led us to define the following steps for the interpretation of the data:

1. The first step was to assess the interview responses with the help of a reading grid that tried to capture all the main factors playing a role in food behavior and articulating with the spatial factor. We categorized these factors in thematic fields.
2. The second step of data interpretation used the **ideal type method**. Referring to Max Weber's writings, Coenen-Huther (2003: 532) describes the ideal types as an “intellectual construction obtained by deliberately accentuating certain features of the object under consideration”, a conceptual creation which “presents a deliberately stylized version of the reality observed in order to reduce the complexity in a selective way”<sup>12</sup>. We have chosen the ideal-typical method in order to objectify the subjective and to think the subjective personal relation with regard to a “reality”. We constructed the ideal types based on the following question: which food purchasing strategies are employed in response to the spatial location of the food retailers? The idea of strategy is related to the researcher's perception of how consumers respond to the spatial constraints they have to face in their daily lives. Spatial constraints are mainly determined by the geographical distribution of food retailers in the consumers' activity spaces. These empirical types are therefore not real, but abstract, “stylized” consumers (Coenen-Huther, 2003). It is a construction based on empirical facts and that helps us in the exercise of objectivation while keeping the subjectivity.

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<sup>12</sup> Translation by the author

## 4. Results and Discussion

### 4.1 Presentation of the results

#### 4.1.1 Results: characterization of the food retail environment

Three types of food retailers were used as criteria to categorize the study area (defined by the author based on the INSEE criteria):

1. general food retailers (MG<sup>13</sup>): grocery stores, supermarkets and hypermarkets
2. food retailers offering mainly “sustainable products” (PFD<sup>14</sup>): markets, organic grocery stores, consumers associations to support local smallholder farmers (AMAP<sup>15</sup>) and farmer’s baskets options
3. “traditional” food retailers (ComTrad<sup>16</sup>): small specialist shops like bakeries, butchers, fishmongers, greengrocers. Mini-markets and frozen food shops were also included in this category.

Each one of these criteria were measured for each IRIS in terms of total number of food retailers and resulted in three sub-criteria:

1. number of general store food retailers (MG):
  - a. low density: zero
  - b. medium density: 1
  - c. high density: superior than 2
2. number of food retailers offering mainly “sustainable products” (PFD):
  - a. low density: zero
  - b. medium density: 1
  - c. high density: superior than 2
3. number of “traditional” food retailers (ComTrad):
  - a. low density: zero
  - b. medium density: between 1 and 2
  - c. high density: superior than 3

The classification of the study area was done based on combination of these three criteria and subcriteria, resulting in three categories. IRIS with similar characteristics were grouped as

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<sup>13</sup> From *Magasins Généraux* in French

<sup>14</sup> From *Produits à forte durabilité* in French

<sup>15</sup> From *Association pour le Maintien d'une Agriculture Paysanne* in French

<sup>16</sup> From *Commerces Traditionnels* in French

detailed in Table 1. On the left column, we present the sub-criteria of MG; on the first row, we present the sub-criteria of PFD; on the right column we present the sub-criteria for ComTrad.

The resulting classification of the study area was:

- **Low density of food retailers:** corresponds to the IRIS where there were no general food stores (low density MG) or stores offering mainly “sustainable products” (low density PFD), although there might be traditional food retailers. The choice to classify these IRIS as low density of food retailers is due to the assumption that the consumer cannot purchase the diversity of food products needed to meet the household needs in terms of food. These IRIS are represented by the dark green color in Table 1.
- **Medium density of food retailers:** corresponds to the IRIS where there was at least one general food store (medium density of MG) or one store offering mainly “sustainable products” (medium density PFD), and at least one traditional food retailer. These IRIS are represented by the intermediate green color in Table 1.
- **High density of food retailers:** corresponds to the IRIS where there were at least one food retail of each type. These IRIS are represented by the light green color in Table 1.

The IRIS categorized as areas with high density of food retailers have therefore a greater diversity of types of food stores.

Table 1. Categorization of the IRIS of the study area

	Low Density PFD (0)	Medium Density PFD (1)	High Density PFD (2 or more)	
Low Density MG (0)	<i>Emile Bernard, Morbihan Est, Saint-Laurent</i>			Low Density ComTrad (0)
	<i>Jean Ogée, Brno, Jean Macé, La Motte Brûlon</i>	<i>Vieux Saint-Etienne, Saint Louis</i>		Medium Density ComTrad (1 à 2)
	<i>Jules Ferry, Cimetière du Nord, Parlement, Liberté Champs de Mars</i>	<i>Parc de Maurepas</i>	<i>Cathedrale</i>	High Density ComTrad (3 or more)
Medium Density MG (1)				Low Density ComTrad (0)
	<i>Le Gast Est, Hotel Dieu</i>	<i>Morbihan Ouest, Le Gast Ouest</i>		Medium Density ComTrad (1 à 2)
	<i>Les Mottais, Paris Ouest Martenot</i>	<i>Emmanuel Mounier, Paris Est</i>	<i>Parcheminerie Toussaints, Hoche</i>	High Density ComTrad (3 or more)
High Density MG (2 or more)				Low Density ComTrad (0)
	<i>ZA Nord</i>			Medium Density ComTrad (1 à 2)
	<i>Dalle du Colombier</i>			High Density ComTrad (3 or more)

Low density of food retailers
  Medium density of food retailers
  High density of food retailers

Figure 5 shows the map with the spatial distribution of the IRIS in the area of the study.

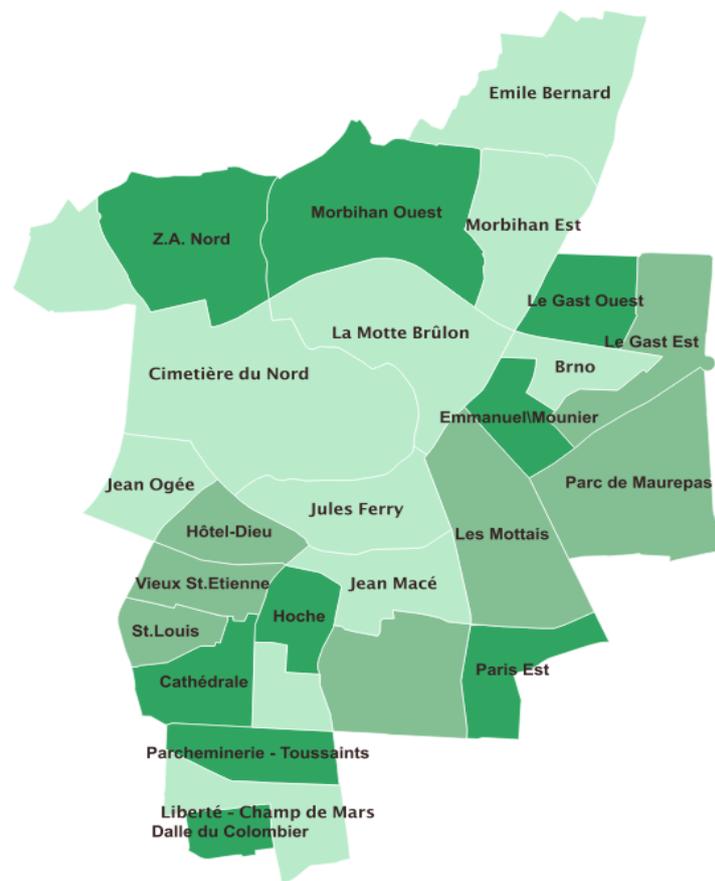


Figure 5: Map of the IRIS of the study area and their corresponding category. Source: author's own elaboration

We found a heterogeneous food retail provision within the study area. The data available to characterize the territory were compared with the actual situation found during the field visits. This verification was mainly done in the IRIS surveyed during the visits, by visual identification and as the interviews progressed. For example, the consumers interviewed described the food retailers available in their activity spaces, particularly around their homes, which allowed us to check whether mentioned businesses mentioned had been enumerated.

As a whole, the food retail environment was consistent with the one we had characterized previously to the field visits. One aspect we would like to highlight is the existence of a “virtual” food supply: this is the case, for example, of stores that sell exclusively online or that provide home delivery services, but that do not have physical stores. This is the case, for example, of Maximo, an online grocery and frozen food store. Today, most of the major food retailers in Rennes provide home delivery services, therefore we can state that the food retail provision available in a territory is generally larger than the one that can be visually identified. It is through daily exposure, through

the interaction with neighbors and through learning over time that consumers get to know the food retail outlets available and that they can have access to in a specific territory.

It is important to stress that in the area of study chosen in Rennes, we have not been able to observe a food desert strictly speaking. In all neighborhoods of the study area there is an available food provision, which can be more or less within reach depending on the location of the activity place. Nonetheless, there are IRIS where there is indeed a restricted food retail environment, even though the consumers living in Rennes have potentially access to food retailers in the neighboring IRIS. Undeniably, this food supply can be judged below the needs and priorities of consumers.

It is important to underline that food retail outlets offer a variety of products from different distribution channels. In open-air markets, for example, we find producers sell their own produce to consumers, as well as traders and middlemen. The mass food retailers can also act as intermediaries between local producers and consumers, even though the supply of local products is still timid when compared to the totality of products offered in the mass distribution.

Today we also find a range of organic products in the major food retailers (Carrefour, Leclerc, etc.), as well as in some traditional or specialist shops. According to Agence Bio, the major food retailers had 44,8% of the market share of the organic food market in 2016, compared to 37,3% of the specialized distribution (ex: organic grocery shops) (Agence Bio, 2017). Characterizing the sustainability of the food retail provision from a broader standpoint, accounting for economic, social and environmental aspects simultaneously, is an arduous task that this study does not have the intention to do. Nevertheless, we have chosen to call “sustainable products” those supplied mainly through SFSC or retailers offering specially or exclusively organic products (ex: markets, organic grocery shops, AMAPs, food basket systems). The assumption is that these food products and retailers correspond to the criteria sustainability criteria in a wider sense. Alternatively, we wish to emphasize that we have made a quantitative characterization of the food retail environment, but not a qualitative assessment of the food that is on offer (in terms of diversity, brands, range of products, etc).

#### 4.1.2 Results: Consumers' food shopping practices

##### 4.1.2.1 *The profile of the people interviewed*

In Rennes, 20 people were interviewed in 14 different IRIS and 1 municipality located in the north of Rennes (9 in areas with low density of food retailers, 5 with medium density and 6 with high density). The IRIS of residence and the socio-demographic profiles of the people

surveyed are presented in Figure 6 and Table 2. A respondent's code was created according to the food retailers available in the area (ex: HD = High Density; MD: Medium Density; LD: Low Density or food desert).

We interviewed two people who do not live in the study area. One person was in the territory during field visits and she accepted to be interviewed. The IRIS of residence of this person is Port Cahours, and it is an IRIS with medium density of food retailers. It is not represented on the map. The other respondent lives in Melesse, a town located about 11 km north of Rennes. The purpose of this interview was to understand the reasoning of a person living in a peri-urban commune. Melesse is not represented on the map but it is characterized as a city with high density of food retailers.

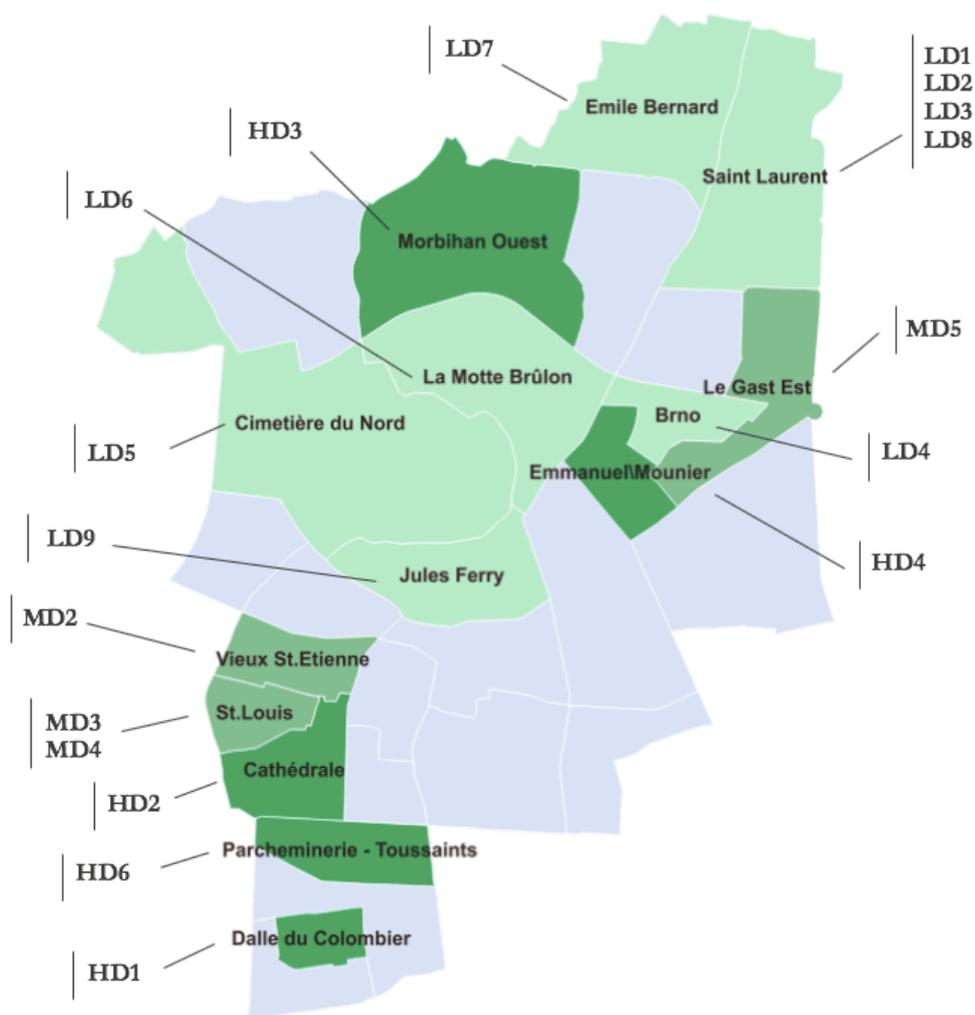


Figure 6: Map of the IRIS of the people interviewed and their IRIS of residence. Source: author's own elaboration

Table 2. Profile of the interviewees:

Code of interviewee	Gender	Age	Household profile	Number of children in the household	Education level	Employment status	Occupational category	IRIS of residence
LD1	M	61	Spouse and children	1 (18 y/o <sup>17</sup> )	Primary school	Employed	Employee <sup>18</sup>	Saint Laurent
LD2	F	57	Shared apartment	-	Primary school	Homemaker	-	Saint Laurent
LD3	F	42	Spouse and children	2 (7 and 13 y/o)	> BAC+2 <sup>19</sup>	Employed	Own-account worker <sup>20</sup>	Saint Laurent
HD1	M	34	Shared apartment	-	BAC + 5	Employed	Managers / professionals <sup>21</sup>	Dalle du Colombier
MD1	F	20	Living alone	-	> BAC+2	Student	-	Port Cahours
MD2	F	80	Living alone	-	High school	Retired	-	Vieux Saint-Étienne
MD3	F	38	Spouse and children	2 (6 and 8 y/o)	> BAC+2	Employed	Employee	Saint-Louis
MD4	M	45	Spouse and children	2 (6 and 8 y/o)	> BAC + 5	Employed	Managers / professionals	Saint-Louis
LD4	M	72	Living alone	-	Middle school	Retired	-	Brno
LD5	F	59	Spouse and children	1 (> 18 y/o)	Professional certificate <sup>22</sup>	Invalidity	-	Cimetière Nord
LD6	M	60	Children	1 (14 y/o)	> BAC + 5	Employed	Managers / professionals	La Motte Brûlon
HD2	F	41	Spouse and children	2 (3 and 6 y/o)	BAC + 5	Employed	-	Cathedrale
LD7	M	28	Living alone	-	> BAC+2	Employed	Employee	Émile Bernard
LD8	F	57	Children	2 (17 and > 18 y/o)	> BAC + 5	Employed	Managers / professionals	Saint Laurent
HD3	M	78	Spouse	-	Middle school	Retired	-	Morbihan Ouest
LD9	F	25	Apartment sharing	-	BAC + 5	Employed	Managers / professionals	Jules Ferry
MD5	F	38	Spouse and children	3 (3,6 and 9 y/o)	> BAC+2	Unemployed	-	Le Gast Est
HD4	M	23	Apartment sharing	-	> BAC+2	Student	-	Emmanuel Mounier
HD5	F	41	Spouse and children	3 (3, 6 and 13 y/o)	BAC + 5	Employed	Managers / professionals	Melesse
HD6	F	24	Living alone	-	> BAC + 2	Student	-	Parcheminerie - Toussaints

<sup>17</sup> Years Old<sup>18</sup> In France: employé<sup>19</sup> In France, the BAC corresponds to a high school degree: Baccalaureate. As people progress through the French higher education system, their level will be referred to as “BAC + Years of superior studies”. Therefore “BAC + 2” corresponds to two years of university study completed.<sup>20</sup> In France : artisans, commerçants et chefs d’entreprise<sup>21</sup> In France : cadres et professions intellectuelles supérieures<sup>22</sup> In France: BP – *Brevet Professionnel*: equivalent to a high school diploma

#### *4.1.2.2 The main factors that articulate with the spatial location of the food retail outlets and that have an effect on food shopping practices*

We could observe that the food retail provision of the study area as well as the food shopping strategies deployed by the people surveyed were very diverse. Through the analysis of the interviews, we sought to understand what are the key factors influencing the purchasing strategies, and how they relate and articulate with the spatial location of the food supply.

By analyzing consumer discourse, we decided to focus on five **thematic areas** that systematically encompass the main factors mentioned to explain and justify the choices made. We were able to identify these factors during interviews. These thematic areas are:

- the financial means
- the routines of daily life
- the conditions for mobility
- the personal preferences
- the ethical consumption

By thematic areas we mean a set of elements that can be grouped by themes. It is also important to emphasize that while these areas are deliberately distinguished for analytical purposes, they are complementary and interconnected.

For all the thematic areas mentioned, there are individual variables, such as socio-demographic (age, education level, etc.) and socio-cultural characteristics, such as norms and values, which play a role. For example, the age can partly explain the financial means and routines of daily life, etc.

Therefore, some factors could be presented and discussed in different thematic areas. For example, using a car for food shopping is a factor relevant to the conditions for mobility and the routines of daily life. Therefore, we are not interested in categorizing the factors influencing consumer behavior and practices, but rather bring them to the foreground them, to discuss the explanatory factors behind the food purchasing practices and how they articulate with the geography of the food retailing.

Thus, we will present the factors identified in all the interviews. However, the interviewees demonstrate different conceptions and positions with respect to each thematic area, which may or may not be present in the discourse of each individual. Once exposed the thematic areas, we will present the ideal types we have constructed. Quotations are presented in italics in the text.

#### 4.1.2.2.1 The financial means

The question of **food prices** emerged spontaneously in most interviews, indicating that the financial and economic standpoint cannot be neglected. The **total budget of the household and the part that can be spent on food** is a factor that helps to explain the choices made about where to go and what foodstuffs to buy. The households interviewed have varied incomes, which depend on the number of people employed or other sources of income, the occupational category, if working full or part time, among others. Income partly explains the discrepancies in the household budgets spent on food. The socio-demographic profile explains some of the differences in income: the salary of a manager is generally higher than the salary of an employee. Also, people who are employed have, a priori, a higher income than those who are unemployed. In larger families, the budget may be more restrictive than in smaller families or people living alone.

According to Régnier et al. (2006), food remains at second place among household expenditures in France. In most countries, low-income families typically spend a larger percentage of their budget on food (Caillavet & Darmon, 2005; HLPE, 2017). Despite the larger share of the budget dedicated to food in France, there is a significant gap at the absolute level of expenditures (Caillavet & Darmon, 2005). Poorer households set up particular purchasing strategies, including the choice of shops offering lower cost food and frequented and cheaper products. Some research results show that poorer households have lower consumption of fresh vegetables, fruits and fish (Caillavet & Darmon, 2005, Darmon & Drewnowski, 2015). Affordability (or financial and economic access) of nutritious and healthy food is therefore a challenge for low-income countries as well as for high-income countries such as France (HLPE, 2017). The price of food is thus a variable having an effect on the quality of the food purchase and consequently on health.

##### 4.1.2.2.1.1 The effect of the financial means on food purchasing practices

We have verified that the **budget represents a constraint for households**, that can be larger or smaller depending on the household characteristics. It is directly related to the price of the products that the consumer wants to buy and the food retailers he has access to, which shows the correlation with other spheres such as personal preferences. That being said, the possible combinations of budget-price are multiple and unique to each household.

Overall, if the consumer's budget is very tight compared to the products he wants to buy, the price emerges as a constraint that forces the person to put into practice strategies to adapt to it. If the budget does not represent a restrictive factor, it can have a secondary effect on the purchasing practices. Thrifty behavior may also exist, and this can be found among people with different incomes.

It seems that the price that each consumer is willing to pay and the budget spent on food relative to other expenditure are explained by the value attributed to food, or the **willingness-to-pay for food**<sup>23</sup>. This is the idea of an “affordable” price. LD5, 59 years old, disabled, married, one adult child at home, explains the importance she gives to food:

*When I was working, I was told: “you do not bother [to spend money on food], you buy good products”. I said “yes, I work. The only right I have is to eat well”. Before if people worked, it was to eat well eh. It was not to go skiing or to buy the latest television. As soon as there is a football match “up!” We run to buy the latest TV. For me, the priority among my expenses is food.*

Some **strategies** emerged during the interviews in situations of restraining budget: choose cheaper modes of transport; go to the shops considered to be less expensive, for example, by making “big food shopping” (*grosses courses*) at hypermarkets and supermarkets and the “small food shopping” (*courses dépannage*, or troubleshooting food shopping, done mainly to buy products that ran out of stock or fresh products) at the local grocery shop or small neighborhood supermarket; adapt the frequency of purchase (ex: if it is too expensive, the consumer goes to the food retailer less regularly); avoiding food shops considered as expensive; going to discount supermarkets; shopping in one single place (ex: to take advantage of discounts offered to those with loyalty card) or several places (ex: to find good deals and compose a cheaper food basket); go to stores that offer discounts and loyalty card; take advantage of promotions and vouchers; use the self-scanning system to monitor the amount spent while shopping; replace certain products by cheaper options; etc. The reasoning behind some practices are described thereafter.

The **comparison between prices of different stores** is usual, especially between neighborhood grocery stores and supermarkets and hypermarkets, most of them located in the peripheral areas of the city, or between mass food retailers and the traditional retailers, as underlines LD7, 28 years old, employed and living alone:

*the Carrefour City [small neighborhood supermarket] is very nice but they do not have everything we need, well, they do not have a lot of things and they inflate prices. Between a Carrefour City is a normal Carrefour there is a huge price difference. And if you take the price difference for an equivalent product like meat, if you compare their prices with the butcher’s price, there is a huge price difference.*

So, he composes his weekly or monthly shopping basket **going to different places**:

*The meat is half Carrefour, half butcher. It's a matter of budget.* LD7

It is due to the difference in price that HD3, 78 years old, retired and married, justifies resorting to the Carrefour City only for small “troubleshooting” shopping:

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<sup>23</sup> This term is used in marketing as a reference to the maximum price that the consumer agrees to pay for a given good of service.

*It's 20% more expensive than other stores. Carrefour City is for troubleshooting shopping.*

People can go further away to shop even if the same products are available near their home. **Giving preference to food outlets offering cheaper products** can be done regularly or sporadically for big food shopping, like LD4, 70 years old, retired and living alone:

*I go further away maybe once a month to a larger food store where I pick up canned food, bottles of water, stuff like that that I store at home. Things that do not spoil. I go there by car just for the really big food shopping to buy in large quantities. Well, things like canned food, here [near home] we find, but it's still cheaper elsewhere. Voila, it's cheaper. And basically, that's it, I go elsewhere very rarely. There is everything I need in the neighborhood, so "why would I take the car and then go elsewhere if there is everything here?" LD4*

**Food shopping to benefit from good deals and promotions** requires flexibility because it modifies the routines and the choice of stores and products available. Some consumers may even create a routine in quest of good deals, if they have free time. LD1, 61 years old, employed, married, one child at home, finds time in his daily timetable to search benefit from promotions:

*I went to the Leader Price for canned products because they are cheap, but I did not buy canned products at Giant [Casino] or at Leclerc, I did not buy, you know, because we have coupons, 60 euros per scan, 12 euros discount with the phone if you scan the bar code. Right now, there is a good deal going on, a coupon: 50 euros of purchase, 10 euros won ... sometimes we take a lot a lot depending on what we find in the mailbox, the coupons and promotions. Sometimes I buy 2 products and 1 is for free. There are many retailers that do this now: buy 2, get 1 for free. The big food shopping is over now. I will wait until the end of the month. I've bought everything, the freezers are full.*

The **reasoning of the price/quality ratio** of foodstuffs explains the value consumers give to products and the budget they allocate to them. Some products are worth more, so they should cost more, but this might not be true for other products. In these cases, the higher price of a product that is judged as equivalent by the consumer is not justified. This reasoning has an effect on the choice of outlets.

HD1, 34 years old, employed and living with a flatmate, would like to buy more frequently at traditional food shops. However, if value for money justifies shopping for cheese at cheesemongers, this does not seem to be true for the meat bought at the butcher. Because its prices are considered too high in comparison with supermarket prices, he **reduces the frequency of purchase**:

*Cheese, when I buy it, is always at the cheesemonger. I think there is a big difference in quality between cheesemongers and supermarkets. I buy almost exclusively there, but it is not very common. It is true that it is one of the few products that I hardly ever buy at supermarkets. Well going to the butcher is quite rare, but ideally, I*

would like to go there more often. Finally, I have the impression that it is still quite expensive at the butcher. Because of the price, I do not go there very often.

If buying a certain product or category of product is a priority for the household but the budget is too narrow, a tactic is to **buy smaller quantities**, as described in LD5:

*In Bretagne, there are plenty of things, yogurt, butter, milk, everything is more expensive of course but it's better. It's better. And so, I buy less. And that's it, I make the effort to buy less products too. And to buy healthier food, to eat less. Voila.*

HD4, 23, student and sharing an apartment with seven other people, also reduces the amount bought so that his shopping remains in the limits of his student budget. **He buys as much organic food as possible**, and fills up his basket with non-organic products:

*I buy pasta Panzani, it's not organic. So, I do 50/50 for some foodstuffs. Rice is organic. The fruit too. Except for the frozen vegetables, I think I do 50/50 too. Because you see, when you take a 1 kg package, it is not organic, but when you take a 500 or 450 grams package, it is organic. So, there is less you see, but it is a quality product. So, it's less but with quality. So, I do 50/50 each time because I'm a student, I cannot buy everything organic.* HD4

The **high price of organic products** was cited as a constraining factor by consumers. We met people who, for concern over health, are trying to buy organic food as much as possible, but that feel restricted by price. This is explained by MD4, 45, employed, married and two children at home:

*I think it's great to have Biocoop [organic shop] nearby, I often go there, except for fruits and vegetables, it's a bit expensive so we buy at the market. Even at the market we do not always take organic because indeed it's still very expensive, well, more expensive, we try, but not for everything, it's mostly for the vegetables [...] The organic meat is much more expensive.*

There are situations in which the price of the products that the consumer would like to buy is too expensive or unaffordable, particularly of organic products, thus they only have the option of **giving them up**, as LD8, 57, employed, divorced and two adult children at home, explains:

*When my father was still alive, he was very attached to his grand-daughters and because me I was not able to afford, he bought me meat at Scarabée [Biocoop]. And he used to say, "They have to eat meat, lots of meat" so he bought me some ham, some cutlets, all that at Scarabée. And it was absolutely delicious! Really, very very good. And I eventually tried to go there, but it's overpriced. I do not have the means to buy this meat on a daily basis. So, having tasted cutlets like those, it is difficult to eat the cutlets sold at the mass food retailers.*

Once again, here we can go back to the issue of the value for money. **Is the perception of the food price as a constraint explained by the willingness-to-pay for a food product?**

The study by Inglis et al. (2007) has shown that the perception of food costs is a predictor of vegetable consumption, being a mediator between the socio-economic position and women's diet in Australia. According to the authors, the perception of affordability can explain part of the socioeconomic differences in diet and predict the probability (perception as a predictor) of people eating certain foods. Nevertheless, this association is not causal because other mediators potentially play a role too, such as knowledge, norms and culinary skills (Inglis et al., 2007).

As this quick overview has shown, the financial means emerged in the interviews collected a constraint on food purchasing practices. We wish to underscore that **the price of food and the budget that can be spent on food are variables underlying any reasoning on how to spatialize geographically of shopping practices.**

#### 4.1.2.2.2 The routines of daily life

Each household has a rhythm of its own. This rhythm is made up of the synchronization of routines formed by the myriad of **daily activities** of each member of the household: work, school, childcare, leisure time, family time, travel time and so on. People need to procure food, prepare it and take time to eat. The various lifestyles dictate the complexity of everyday life. According to Hayn (2009), social and economic changes are putting increased pressure and complicating the **organization of everyday life**. More flexible working time, for example, attenuates the boundaries between private and professional life and demands more organization.

Similarly, the increased presence of women in the labor market has made day-to-day life more complex. Women remain as the main responsible for household chores within households (Hayn, 2009). All over the world, women are very constrained and time spent purchasing and preparing food is a significant burden on women (Herforth & Ahmed, 2015). In a study of low-income women in Montreal, Engler-Stringer (2010) concluded that they spend a lot of time and energy on food shopping, in terms of distances traveled and travel time, and in developing the organizational skills needed to meet all the family's food needs. In France, there is increased participation of men in the food purchasing activity. Even though the share of time devoted to food shopping by men has increased in France, cooking remains a female task (Régnier et al., 2006, INRA, 2010).

We have seen homes with couples where the responsibility for the supply is shared within the couple. That's the situation of HD2, 41 years old, holding a part-time contract, married and two children at home. Nevertheless, the preparation of food is based primarily on her:

*Because me I like to go to the market, it is me who goes to the market and my spouse who goes to Carrefour. [He] does not like the market at all because it takes too much time, so he prefers to go to the supermarket 'cause it*

*goes faster. So voila. This way each one of us both gets to do what he prefers, that's convenient for us. It's me who cooks. When we invite friends, my husband also gives a hand to prepare the food of his region, he is the specialist! Otherwise it's me who cooks.*

At the household of HD5, 41, employed, married and three children, the situation is similar. She is the one in charge of cooking:

*[...] 80% of the time it's me who cooks. It is the second journey that begins. We come home from work and we say "what do we eat?" [...] And the evenings when I'm not home, I leave the instructions.*

Yet, daily routines and the time constraints they impose are directly related to the socio-demographic profile of the household: retired and unemployed people are generally less constrained by time than employed people. Also, people living alone or in a couple can more easily harmonize the routines of the household families with children.

#### 4.1.2.2.2.1 The effect of the daily routines on food purchasing practices

**Time** appears as a central element in the organization of daily life routines: it represents a cost for the household. The consumer needs to set aside time in his schedule to shop for food, he needs to adapt to the opening hours of shops, etc. Often the choice of food retailers is guided by the question: **which shopping strategy allows to save time?** This is correlated to the conditions for mobility that will be further described.

During the interviews, we noticed that the time pressure can be a strong or moderate, or not represent a constraint at all. If time is restrictive, some shopping **strategies** seem to respond to these constraints: going to nearby outlets; shopping in one or few places; establishing a shopping planning routine; shopping less frequently; coupling or sequencing food shopping with other activities; prioritizing some places where there is a variety of retailers (ex: supermarket, bakery, shoemaker, other facilities); shopping online and using the drive<sup>24</sup> (or click-and-drive system) and the home delivery; sharing the task of food purchasing with other people in the household; etc.

For consumers with less time constraints, shopping can **shape routines** and be a **moment of pleasure and exercise**. It's a tactic to go out, to promenade, as describes HD3:

*Every day we go to Intermarché Longs-Champs [hypermarket] to shop. We take the car and buy the newspaper, the bread, the fruits and vegetables, the seafood and the fish, if we like it, so finally we do this every day. The meat we buy at the butcher, we go to an independent local butcher located at a commercial center not very far.*

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<sup>24</sup> This drive-through delivery model consists of a system through which consumers order online and pick up the foodstuffs at a drive-through collection point. An employee of the supermarket charges the trunk of the car with the products bought.

*Once a week we go to Leclerc [hypermarket], that allows us to go out at the same time. We'll get the newspaper and all that. Otherwise we would stay home.*

**Having children and a professional activity** seem to be situations that increase significantly the time constraints of the household, especially if they are cumulative. In these circumstances the consumer would prefer to have everything at hand, so **proximity** becomes a key variable because having food retailers nearby helps to save time, as MD4 explains:

*For us it's rather a choice of proximity to where we are at a given moment, to save time. For example, the food basket I pick up next to my place of work. And the Chronodrive [click-and-drive] originally was that, next to my wife's workplace.*

It is important to emphasize that the **perception and relation to distances** is not the same for all consumers. Also, proximity is not only reasoned in terms of geographical distances but also in terms of time (a measurement or evaluation not completely objective or not always achievable from the point of view of saving resources).

In fact, the idea of gaining **convenience** seems to be a key factor for the consumer, as previously discussed according to the definition of Herforth & Ahmed (2015). It seems to us that the consumer goes beyond the reasoning time versus distance. We thus apprehend the notions of simplicity and comfort (for example, due to the presence of a parking for the bicycle, of someone who helps to carry the shopping bags to the car, or even the possibility to walk and spend time in a pleasant atmosphere) complete the idea of convenience.

This convenience exists for those using the **click-and-drive**:

*It's an application on the tablet, you see your favorite products and it takes me 10 minutes! "Click click click click and up!", it is done. HD5*

LD3, 42 years old, employed, married, two children, reinforces the advantages of the click-and-drive over other retail options:

*The drive changed my life huh! I think that when we are economically active, when we have children, well it's a period where we have much less free time. It was after the birth of my son that I started using the drive and today I would have difficulties if I could not use it. Really, it's a matter of time saving. I think that when children are older, I will go more often to local shops, maybe to market, that's something that I miss.*

The "practical" side of the drive pushes MD3, 38 years old, married and two children, to travel to a click-and-drive collection point that she has been using for four years:

*It's not at all on my way, but it's the practical side of the app on my phone, of shopping at home on my tablet, we do "click!". I downloaded it on my phone, so I'm doing it like that now all the time. I do not want to spend 1h30 looking for things all over the place, it takes me too much time now with children [...] The collection*

*point is actually far from home, so it's a pity. If there was something closer, and where to get around with my little shopping trolley without having to take the car, that would be ideal. MD3*

MD5, 38 years old, unemployed, married and three children at home, believes that the drive is a way to grant more time to the family:

*When I start working again, I think we'll have to use it [the click-and-drive]. We also need to spend time with our children, so we will lose less time in supermarkets.*

Nevertheless, the preference for the drive is not unanimous. We met consumers who criticize the drive:

*We always worked and we always went shopping. I am against the drive. Because it's another thing not to go shopping, it's a way like any other not to go to the store, soon there will be no more stores, we will order on the internet and they will drop it off at your door. It's true, people do not interact anymore, it's over! HD4*

*You do not go out, you are not in contact with other people during while you shop, you do not relax since you always hurry. LD5*

For some consumers, planning a **fixed grocery shopping routine** is a alleviate the time constraints of daily routines and to save time. MD1, 20 years old, student, living alone, explains:

*I go [to the supermarket] every Monday around I would say 6 PM, 5PM, at the end of my journey. I go walking and it's really every Monday, it takes me I would say 45 minutes. During the academic year it's easy, it's precise and set like a clock.*

LD2, 57 years old, housewife, living with a flatmate, also set up a day for her food shopping, which has become a habit: every Saturday. This **habit** is so rooted in her routine that she does not see how to do otherwise:

*I go there almost every Saturday! Often, it's Saturday because it's a habit. No, I have my little habits myself. Onlalah! You must not change my little habits!*

Oppositely, other people have **difficulties establishing a fixed shopping routine** that could be time-saving:

*I am alone with my two daughters and I work. I'm not very organized, I have a lot of trouble to plan menus for the week, so I usually go shopping three times a week. I saw an option of an organic shop [that interested me], I don't know what it's called, we can also order online and have the products delivered at home. But I haven't tried it yet, I mean, you have to be very organized to do that. LD8*

This same consumer expresses a difficulty also sequencing work and food shopping:

*When I go home from work, I never do my grocery shopping. I buy when I do not work. Because after a work journey, I'm tired and because shopping is an absolute drag, I do not want to end my day like that.*

**Sequencing work and grocery shopping** is a strategy commonly used by LD6, 60 years old, employed, divorced, one son. For him, sequencing travels is common and is a time-saver:

*I only go there when I need, there is no frequency. Maybe once a week, or twice. Or even three times if something is missing. I take the car and go, but well, it's on my way to college. I just have to do a little detour.*

LD3 prefers to **couple food shopping** with other activities:

*If I can couple my shopping with something else, I do it, especially for the fruits and vegetables basket. The pickup location is near my bank so when I need to go there I do both at the same time. But otherwise, I go specifically [to pick up the basket].*

Buying **everything in one place** is also a strategy used by consumers:

*I do not have the time, the willingness or the energy to buy three at Scarabee and the rest at Super U [supermarket] and the rest at the local merchant, I prefer the simplest way [buying everything at the same place].*

LD8

This thematic area is therefore correlated with the conditions for mobility, which will be further described. Finally, we met consumers who criticize the perception of food shopping as a constraint. LD5 justifies:

*[...] even when I was working I found time to do my shopping. Ah hmm, take a basket already prepared! It is surely nice, I can conceive it for people who work, but that is the notion of the time that people believe not to lose. I don't believe that time is wasted. When you get off your car to go shopping, it is not a wasted time, huh. Well because we are directed to believe that this time is lost. "Ah, you're wasting time!". So, we're stressed. But I do not see that, it's not a lost time. Time cannot be lost.*

Finally, the statement that people need to find time for food shopping reflects an ethical dimension:

*So, I think there's certain indecency to say that we have no time to buy food while there are others who would like to do what, right? This is something that I refuse out of respect for the millions of people who are starving. It's my way of contributing to the community. LD5*

#### 4.1.2.2.3 The conditions for mobility

The main means of transport used by consumers for food shopping are **cars, bicycles, public transport (bus and metro) and walking**. This thematic area is connected to the geography of the city. The choice of the modes of travel is justified by several elements such as the location of the residence and the activity places (downtown Rennes is more difficult to reach by car, for example), by the location of food outlets, by the infrastructure of shops and of the area of residence (ex: presence of parking lots or bus stops), by the means of transport available, etc. The socio-demographic profile (income, age, etc.) are also correlated with mobility.

**The question of time is omnipresent.** The consumer compares the time spent to reach different food retailers. It seems like the **car remains a vector of access** to businesses. It expands

the food retail environment that can be physically reached, as argued by Bader et al. (2010), principally in car-oriented cities. In Rennes Métropole, information on available means of travel was gathered during the last household travel survey<sup>25</sup>, conducted in 2007. According to this survey, conducted by INSEE, the most popular means of travel for commuting among the inhabitants Rennes is the personal vehicle (49,9%), followed by public transport (27,2%), walking (11,6%) and cycling or motorcycling (8,2%).

Of the 20 people we interviewed, 13 have a car at home, 10 use it routinely for food shopping and 3 use it very rarely for this purpose. Nearly 55% of the people we interviewed used their car to shop, proportion relatively similar to the statistics for car use Rennes.

#### 4.1.2.2.3.1 The effect of the conditions for mobility on food purchasing practices

This thematic area helps to explain the choices made regarding the places and the frequency of purchase. Constraints related to mobility are therefore linked mainly to the modes of transport and they lead to different **strategies**: reduction of the frequency of grocery shopping together with the choice of as few places as possible (ex: consumers using the bus); increasing the frequency of purchase (ex: consumers on foot who cannot carry too much weight); give preference to outlets near home (ex: consumers who do not have a car) ; coupling or sequencing food shopping with other activities and making little detours; use the click-and-drive; use the home delivery service; seek the help of others, among others.

Public transport lines partly determine the food retailers that consumers can access. Most consumers said that Rennes is well served by public transport.

The consumer **compares the time spent on each means of travel**. The choice of using other modes of transportation besides the car depends mainly on the proximity of shops and the time available to devote to it. LD8 emphasizes the paramount importance of the car in terms of time saving:

*Me, I do everything by car ... I am very slave of my car. I work in the city center and drive all the way there. Once I started to go by bus, but it takes me about 40 minutes to get there by bus, with the car I need 10 minutes.*

LD6 attests the **supremacy of the car over the bicycle in terms of time saving**:

*By bike it takes longer. It's a matter of time availability. I definitely do not have time. So today because of my job and I do not have a lot of time. Maybe later when I have time I will do otherwise, but not nowadays.*

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<sup>25</sup> The last survey (EMD: *enquête ménages déplacement*) is available from <http://metropole.rennes.fr/politiques-publiques/transports-urbanisme-environnement/les-deplacements/>.

With respect to the use the private car, we have identified contrasting positions among consumers which oscillate between: the position of a consumer who avoids it to the maximum, who feels dependent on it to do his shopping; , or even “trapped” by it and would like to shop without it; and the position of a consumer who is rather neutral with respect to the use the car (ex: he does not ask to himself if he likes it or not, or if it is good or not, etc.), to whom it ensures convenience.

Nevertheless, using the car in some parts of the city of Rennes, like downtown, is complicated because it is not easy to park. While some people prefer the car, others prefer **active modes of transport** and choose not to take the car for different reasons:

*We like all kinds of active travel in fact. To do everything on foot or by bike, we like it. [...] Not having a car was a choice. So, we use the neighborhoods food retailers, we do everything nearby, on foot, by bike or by taking public transport. On one hand it's a matter of consciousness, we say to ourselves that the car very pollutant, on the other hand we do not like driving very much. So, we got used to living in big cities and we got used to having public transport. It was easier.* HD2

For this consumer and her family, the choice of not having a car has even determined the choice of where to live in Rennes. It was therefore necessary to choose a neighborhood where everything could be done on foot:

*It was a lifestyle choice to live downtown and not having a car. So, we do not go to commercial centers, nor hypermarkets and supermarkets located in the outskirts of Rennes. We do everything in our neighborhood.* HD2

Other consumers living in areas or neighborhoods with a more restricted food retail environment refer to the constraints imposed by mobility. LD7 prefers to use the bike and it would be complicated for him to have to take the car regularly for grocery shopping.

Even though he can't borrow a car or do carpooling, he prefers cycling over taking the bus. This is due to the fact that there is **a part of the trip between the supermarket and home that is not covered by public transport:** between the supermarket and the bus stop and between the arrival bus stop and home (the last kilometer or last mile problem). He feels therefore demotivated to take the bus because he cannot optimize the trip. In this case, he relies on **equipment to carry the shopping bags** and asks for the **help of someone else:**

*But it's true that I never shopping by bus. On the other hand, it happens that I make big bike shopping trips equipped saddlebags, big backpack when I do not have the possibility of taking borrowing a car. So, we go to Saint Gregoire [commercial zone] with my girlfriend. I think there's the bus line 14 that goes there, but once again public transportation is fine, except that there is always the problem of the last kilometer, and the last kilometer when you have big and heavy [weight to carry] it's complicated. And since we do not have the right to take the bike on the bus, well, it's complicated.* LD7

This consumer finds that not everyone could not do their shopping by bike like he does and explains the situation he wished he could have in his neighborhood:

*I know that I can take the bike to go there but it's because I do a lot of cycling and I have legs that can handle it. But I know a lot of people who would not be able to food shop like this way. I wish we had less hypermarkets in the fringes of the city road and more small food outlets scattered everywhere. I'm fed up with stuff on the periphery. And the ideal would be to have an organic shop close at hand. Also, a food market on Saturday, I'd go there for sure. LD7*

LD5 endorses that the bike would impose a considerable **physical effort** that, summed with the **risks of riding a bicycle**, discourages her to use the bike for food shopping. Unlike LD7, she regularly takes the bus for this purpose:

*The bike I do not use because I have a lot of muscle weakness. And in Rennes the bike-car relationship is not the best. It scares me a little. When I ride my bicycle, my head is in the clouds, so I have to be careful. It sucks a little bit. I think the city is well served by public transport.*

Shops outside the city are more easily accessible by car than by other means of transport, for which the **infrastructure** is more limited. Some consumers refer to the difficulties like cold in winter or even a lack of lighting at bus stops, for example.

People using the **bicycle sharing scheme** existent in Rennes mention the weaknesses of the system, such as the limited number of stations, and its consequences on shopping practices. HD6, 24 years old, student and living alone, benefits from the system because she does not have a personal bike.

*You have half an hour for free, so I usually try to fit my travel in this 30-minutes slot. This is also why I choose the shops close at hand where I can drop off my bike at a nearby terminal or leave it but not too long. I have to attach and lock my bike in front of the store and afterwards I can leave again with it. But some stores are big, I need more time, so I can't do this because it has no bike station nearby. I prefer to drop off the bike in a terminal, so I don't have to be in a hurry, I can go shopping and take my time.*

Riding a bike or walking for food shopping create other difficulties, such as **carrying the groceries** home. Compared to walking, cycling is considered more convenient for shopping when the consumer has more volume and weight to carry. A shopping trolley, tote bags or large shopping bags are useful accessories for those who do their shopping on foot. In families with children or larger families, the **volume and weight** of groceries are normally more significant compared to the that of homes of a single person, as affirms HD1:

*Carrying the food basket was okay, it fit in a bag not too big, not too difficult to carry. After work, I just had to bring that bag back into the bus, which was not very heavy, not very cumbersome, not too annoying. Because*

*I took just for myself. I remember I had a colleague who took for her, her husband and her children, so she bought a larger quantity and it was more complicated to carry while walking.*

Carrying groceries home can be as restrictive in **homes and buildings in difficult-to-access streets and neighborhoods**, without an elevator or a parking lot. This is especially true when people have to carry larger, heavier groceries. For these consumers, **home delivery** seems like an interesting option:

*[Home delivery] is something I like a lot, even though nowadays it's becoming expensive. As times goes by, it's becoming more and more expensive. I had free delivery for 80 euros before, but it went up to 130 euros. It's completely excessive. But it's very convenient because I can't park in front of the building and, well, if you have to carry water packs, milk packs, stuff like that, I find it very practical to get home delivery so that's it for me it's a good option. LD8*

Home delivery is referred to by consumers as an important option for people restricted by illness, injury, disability or for the elderly. Also, the difficulties to drive a car increase with age.

The thematic area of conditions for mobility goes beyond the means of transport available to move, according to the approach proposed here. There are people who have to adjust, for example, to their **physical capacities** to carry weight. For elderly people, people with disabilities or other restrictive situations, shopping can be extremely difficult. The location of roads, their maintenance and the topography that are between people's homes and food outlets can have a negative effect on practices, as explained by HD2, that is thinking of the possibility of trying the home delivery:

*Here [near my home] there is a small slope and when the shopping trolley is very heavy it's difficult, so I do not take a lot of heavy things to avoid transporting it. When I was pregnant, and I also went shopping at Carrefour, the trolley was just too heavy, so I had thought about the possibility of home delivery.*

Mobility is therefore a critical component of how consumers coordinate and spatialize their activities: it can facilitate or hinder daily routines, amplify or limit the supply of food to which a person has access. **Whereas the means of transport partly explain the choice of shops, the location of retailers also explain the choice of means of transport.**

There is a set of factors that together circumstance mobility: it remains a moderator of consumers' access to the food retail environment, which may limit or expand the panel of choices.

#### 4.1.2.2.4 The personal preferences

This thematic field is determined by values, traditions, beliefs, tastes and other personal and interpersonal factors. Consumer purchasing practices are therefore influenced by these preferences, which articulate with the food environment to which the consumer is exposed.

It seems important to stress that food is a social fact of inextricable complexity. It is a key element of the identities of individuals and social groups, as well as a marker of social status (Régnier et al., 2006). A myriad of items explains what people eat, as previously discussed in Chapter 2 based on the conceptual frameworks of HLPE (2017) and USDA (2010 apud Herforth & Ahmed, 2015), and understand them all in their entirety is not an easy task.

As the interviews were done, we have pinpointed some factors that seem to explain the consumers reasoning about their personal preferences as well as the choices made: health; taste; diets; culinary heritage; the image of the food outlet, among others.

#### 4.1.2.2.4.1 The effect of the personal preferences on food purchasing practices

Food retailers consider consumer preferences and trends. For example, we see the increase in bulk sales and in the organic products on offer, among others. Supply and demand exert influence on one another.

The food retail environment has an effect on shopping practices. LD7 and MD2, 80 years old, retired and living alone, describe the food provision in their neighborhoods:

*I find just about anything I want. I have no desire if I cannot find, to make it simple.* MD2

*Me, let's say that I plan my diet more within the limits of what I can buy here than the other way around.*

LD7

Health plays a prominent role. Concern about health consequences of eating has been raised by consumers. Eating fresh fruits and vegetables, not eating processed foods or prepared dishes, eating vegetarian, eating organic. These are examples of healthier eating habits mentioned by consumers during the interviews. **Having children can increase this concern over health**, as explained by HD2, who bought bottles of water for her children when they were little. This corroborates the example of Delestre & Meyer (2001 apud Caillavet et al., 2006), where women go from first-price products to more expensive, top-range baby products. According to MD3, organic eating partly addresses this concern:

*The children have changed things a little bit I think. A little bit anyway. I'm more for organic food since I have children.*

In other households, the experience of disease in the family has **increased the consumption of organic products** and concern about feeding the children, as MD4 explains:

*My wife is quite sensitive to everything that is linked to diets, in fact and I think this concern has augmented because she wants to inculcate children with the taste for variety. Not eat fries or pasta all the time. So, she tries to push everyone a little. And well, my mother died of cancer not very long ago, so this pushed me strongly to buy more organic too.*

MD5 also demonstrates concern about child overweight. **Procuring fresh fruits and vegetables** is therefore crucial for this household:

*We try to eat more raw vegetables, more fruits, more fresh things, whereas when we are young we tend to eat anything. It's for health. It was hard to get the kids used to it. My eldest had trouble eating vegetables and fruits. But he eats them, he does not eat everything, but he eats. And finally, it is mainly raw vegetables that he prefers rather than cooked vegetables. I tend to prepare the vegetables an entry course. I am very careful to prevent my children from gaining too much weight. I do not want my children to become obese. Since there are people who tend to become obese in the family, I'm very careful about that.* MD5

Another central factor that appeared during the interviews is **diet** and particularly specific diets. Out of the respondents, 4 were vegetarians and 7 have reduced or are trying to reduce meat consumption at home (for reasons of health, ecology, animal welfare, etc.). Consumers who have dietary restrictions, such as gluten-intolerant people, people with diabetes, or people who eat halal meat, are more **watchful towards packaging and rigorous in the choice of food retailers**. There are some products that they would like to eat but that they do not find easily, and similarly the choice of outlets is reduced compared to a consumer who has a more “traditional” diet. How to shop at the butcher if the consumer is vegan or at the bakery if he does not eat gluten?

Normally these consumers are very **careful in evaluating the food outlets** and they like to have a choice. MD1 declares eating *gluten-free, lactose-free, meat-free and normally sugar-free*, which creates an additional constraint concerning the choice of products and the retailer. **Changing the supermarket chain** she is used to go to corresponds to a change of habit and a hurdle difficult to clear:

*With the diet I have now, there is a product line that I take all the time. The first time I spent two hours reading all the labels, but now I know that at Leclerc [supermarket chain] it's resolved. I know the composition of their products. Last year [I had to go] to the Intermarché [supermarket chain] de Longs-Champs, but it was a hassle, I spent time, I did not understand anything because I was not used to it in fact.*

Because she has options near her home, she prefers not to go somewhere else, even when she can't find everything she wants:

*I will not go somewhere else no no. For example, if a product ran out of stock, I'll replace it, I say to myself that I'll find it maybe next week. The problem is that the gluten-free bread is often out of stock. So, I'm going to take buckwheat crackers, it's worse, less tasty, it makes “less bread”, but I'm not going to move just for the gluten free. This consumer concludes: For me, the ideal would be to go live elsewhere.* MD1

Some consumers talk about the challenge of **harmonizing the family's diets and eating habits**:

*I tend to eat a lot more fruits and vegetables than the other members of my family. I try to find a middle ground. But it's true that I would have a different diet if I was alone. It would be less meat and a lot more vegetables.*

LD3

Having **cooking skills and a culinary heritage** plays a role on what consumers eat. Experience builds up knowledge that allows consumers to save time in the kitchen. It is in situations where they want to receive friends and eat well that they make complementary efforts to purchase food. Some consumers said to have a lack of cooking skills and therefore feel limited in their choices (for example, exotic vegetables offered by basket systems are considered to be more “difficult to cook” than others).

“Simple cooking” was mentioned as a strategy to minimize the effort. For example, buying vegetables already sliced, such as frozen products, are strategies for spending less time cooking. They are also alternatives to fresh vegetables that contribute to reduce shopping frequency:

*When the children were very little, and I was working full time, it took me a lot of time to prepare vegetables. The little children did not sleep so I was extremely tired. In the evening it had to do things quickly so that I could go sleep. So, during this period I was getting frozen vegetables that were already peeled and sliced. Now little by little I am buying again fresh carrots. I'm not working full time anymore, so I can indulge me and my family, I have time to cook.* HD2

There are consumers who do not see these products are good alternatives:

*It takes 10 minutes to peel vegetables and 20 minutes to cooking them. I do not see how it takes time. I've always found a solution, when I was in a hurry I chose not to stop at supermarkets to buy frozen foods, for example. There are plenty of vacuum-packed products that I would not give to my children, not canned or frozen foods. I find them disgusting.* LD5

The **preference for organic products** is common among people who have a particular diet or who are very concerned about their health. This corresponds to the conclusions of the study by Baudry et al., (2016), that confirmed a strong positive association between frequency of organic products purchase and vegetarianism: people who buy organic more frequently have “healthier” lifestyles: more vegetarians, less smokers.

**Eating organic** interests most of our respondents: 14 buy organic products (some products, most products, as much as possible etc.), with health as a central incentive as well as the environment. Other types of labeled products like the Bleu-Blanc-Cœur<sup>26</sup> or products from a more rational or sustainable agriculture (*agriculture raisonnée*)<sup>27</sup> were also mentioned as options that meet

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<sup>26</sup> Nutritional label that offers products supposed to have a better nutritional balance: <https://www.bleu-blanc-coeur.org>

<sup>27</sup> This type of agriculture “aims to control the positive and negative effects of agricultural activity on the environment, while ensuring the quality food products and maintaining, or even improving, the economic profitability of farms.

their preferences and can replace organic products when budget is a restriction. We noticed different opinions and expectations about organic food among consumers, as well as a lack of trust.

We also met some people who do not feel sufficiently informed about this topic, and who therefore do not buy organic, and two consumers who did not know what organic products were. According to a study by Baudry et al. (2016), a higher level of education is one of the determinants of consumption of organic products. The question of the price of organic products emerged frequently and the value for price was brought up:

*No, it's too expensive, it doesn't fit our wallet and I do not have enough information. Besides, I feel that it says it's organic on the product but it's not necessarily organic. Well I still do not have enough information to really buy organic.* MD5

*Especially when you are a student, you have the question of the budget. Still I tell myself that I am paying for what I eat, you see, I complain a little about the prices, but there is no real need to complain. I think the price is fair.* HD4

*We do not always eat organic, but we prefer for some products. It's true that we could pay the price and get organic to have a good product, but there are other good products, well, at least in terms of taste, which are good as well, that are not organic, but have a reasonable price, so we turn more easily to that.* MD4

Some consumers do not consume and do not want to eat organic food. The lack of trust in organic is an explanatory factor:

*I normally eat like everyone else, I do not see why I would go for organic food. Is organic better for health? If the food I eat was bad, I think I would be dead by now. So organic, for me, it's far-off. Does the word organic mean that it's organic? Well, everybody has their own ideas, but it does not interest me.* LD4

HD3 is very skeptical of organic food. His wife buys a few organic things from time to time, but he does not agree with it:

*There is a lot of organic just on paper. I do not believe in it, hub. For example, the honey. Beekeepers say to bees: "Do not go to the crop fields of the neighbors, eh!". Wait! What is organic? If there are crop fields near the beekeeper and he is surrounded by other farmers who spray pesticides a lot. And we call it organic? I wish but instead I call it human stupidity, that's all!*

And even consumers who prefer organic criticize it:

*The word organic, it annoys me. When I go to the market, I see farmers who grow their vegetables. It has been like this since the dawn of time. There's nothing more organic than growing tomatoes in the ground. Except if*

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Definition by Paillotin, 2000, in an official document of the French Ministry of Food and Agriculture. Available from: <http://agriculture.gouv.fr/ministere/lagriculture-raisonnee>.

*you put pesticides. If you buy from small vegetable farmers, it's obvious that you get good products... well healthy, that's what I mean. But the word organic actually makes me a little tired.* LD5

Several consumers have compared the price of products offered by Biocoop, the leading cooperative network of organic shops in France, with the prices found in the open-air market, specially of fruits and vegetables. They are perceived as cheaper in the market. Getting organic food in the major food retailers remains a widespread option, that has disadvantages:

*At Super U there are organic fruits and vegetables. Most come from Spain. It's not a guarantee of quality for me. In addition, the packaging is outrageous. It's organic but it's packed in a plastic tray wrapped in plastic film [...] All the organic there is ultra-packed.* LD8

*I avoid products coming from Spain. It's the country of pesticides for me. Even though it's organic, if it comes from Spain I do not buy it.* HD4

**Product origin** is also a factor that has an effect on the choices of certain consumers. But what does it mean **eating local food**? Each consumer seems to interpret then notion of local food differently: food grown within a specific distance (ex: 100 km), food produced in Bretagne, food from France, etc.

Motivations are also varied: supporting French culture, eating fresh, tasty and quality products, a fair revenue to farmers, reducing the carbon footprint, etc. Products from Spain are often disapproved (not good for the environment, no taste, etc.). Some consumers are not interested or not aware of this topic:

*We do not think about it [local products]. I think ... I think it concerns maybe people who are more in the countryside, in small towns around Rennes. But us [in Rennes], frankly, we do not talk about it. We do not hear about it. Me personally, I interact with a lot of people, I go out a lot, but I do not hear people talking about it.* LD4

When the consumer eats local food, he tends to **follow the seasons**. Many consumers try to eat with the seasons. Nevertheless, this is not easy for everyone:

*I try to follow the seasons. But we are often very lost because some vegetables are available even outside the seasons. Sometimes I say to myself: "But is it the season of this vegetable?" I am a little lost in the seasons. And I even have neighbors who tell me: "It's not the season and you buy them anyway?". Well, I say "yes, it comes from France, so it's the season has begun".* MD5

**Eating fresh** is a desire almost unanimous among the interviewees, as well as the desire to eat **tasty** and **quality** products, all correlated with freshness. The lack of taste of fruits, especially the ones sold in the major food retailers, is a widespread consumer complaint. Purchasing organic and local produce is a strategy that partially meets these needs.

*Some products come from far away, we can't replace them. So, I try to buy local produce to compensate, if it's good. It must be local and of good taste, of good quality.* HD5

Finally, we found that the **food retailer image** is a factor frequently mentioned. Bezes (2013) discusses the concept of store image by highlighting its specificities in relation to the concepts of personality, atmosphere, quality and shopping experience and affirms that it corresponds to a subjective representation composed of rational and emotional elements, tangible (price, products, location, etc.) and intangible (reception atmosphere, salespeople attitude, smells, etc.). Some of the consumers interviewed rely on retailer images to justify their purchasing practices. This factor seems to articulate with the spatial location, which supports the assertion that the image of the store “intensifies or even offsets the effects of proximity” (Bezes, 2013, p.98).

HD2 justifies why she does not shop at the organic store near her home:

*[...] it's too small, there is an incredible amount of people, Saturday afternoon it was terrible. I went there once with the kids and it was awful, too small, too crowded, there was a very big line. So, I did not return there anymore.*

LD2 and LD8 **compare retailers** and justify why proximity is not the main attribute considered:

*I go to Super U Rue de Fougères. Before I went to U Express au Gros Chêne, but I did not like the atmosphere, the people that went there, and then I found better at Super U. It is big, it is good. U Express is smaller. It's not far, it's the even the same manager. I went there but I do not go there anymore. Well, when I go to the hairdresser I can eventually go there, but it's rare.* LD2

*My food shopping is done at the supermarket Super U Rue de Fougères and not at supermarket closer to home. The closest is the Intermarché du Gast, but I do not like it at all, I find it very creepy and sinister, so I go to Rue de Fougères. It's not the food products available, not at all, it's only, “how to say?” The environment, I feel frustrated at the Gast, I dislike it, the layout and arrangement of the store is horrible. I already hate shopping, if I also have to go to a place where I don't feel well, it makes things even more difficult.* LD7

Some consumers reveal their **attachment to certain retailer chains**, like MD1:

*I shop at Leclerc Cleunay. I have an attachment to Leclerc, my mother has always shopped there, I know their products.*

Her boyfriend presented her another food retailer chain, Lidl, where she wishes to start shopping: *I have a good opinion of this chain. My boyfriend he is a fan of it, he goes there all the time, so he has had a little influence on me to go there.*

On the other hand, we have noticed a **reluctance of some consumers towards mass retail chains**, or even a refusal to shop there. Many reasons are given, but among them is thriftiness and the desire to avoid exposure to discounts, promotions and other elements that lead

impulse purchase. **The click-and-drive and other online shopping options** are listed as options to reduce consumer vulnerability.

*Shopping online is not bad. I think we stick to a list and we consume less than if we had gone to the store. We limit ourselves to what we want to take and we're not attracted by this or that. Well there is not necessarily everything so indeed sometimes for specific products we have to go to the store. LD3*

HD1 explains why he hopes to use the click-and-drive system:

*It's true, in the food stores there's this little marketing aspect, with promotions displayed everywhere to make us buy more. It's true that it's something that I do not like but that we undergo anyway because we are there ... so the drive is not bad for that, to focus on what we really want to buy without being distracted by everything that is showcased to be sold. HD1*

Other consumers complain about the **quality of the products displayed** on the shelves of the mass retail supermarkets:

*To see rotten fruits on the stalls, moldering next to good fruits, it disgusts me. I tell myself that the people who are between the farmer and the consumer are not always, "what term to use?". They do not always pay attention to the products so suddenly there is something that is not right. Yet we pay for this service because between the price they pay to the farmer and the price we pay at the supermarket, there is still a huge difference. And today I find that this service is not good given that we have rotten vegetables on the stalls. Bad and not necessarily of good quality. MD5*

*I would change for example the fruit stalls at Intermarché. It's devalued, I think. They are at the bottom left there, next to the fishmonger. The exotic stall is poor, that we can understand. But darn, you see lettuce on the ground, wet boxes and all, it annoys me! HD4*

**Food markets** have been referred to many times as **places of interaction between consumers and producers**, where the consumer finds a pleasant and convivial atmosphere, where he can even build up a relationship of loyalty. They also offer fresh and cheaper products, among others. HD6 compares two markets located near her home:

*The Marché des Lices [largest food market of Rennes] is a bit of a catch-all so it's a bit difficult to know what's in the stalls. "Do they have organic produce? Do they have organic and local?" well, there are too many things, I'm lost. I admit that I do not know how to identify the stands. There are too many people too. I prefer the Marché du Mail [another food market], it's small, it's local, it's organic and we find the info easily. I stop on the way back home without having to go there just for that. And it closes at 8PM.*

Finally, consumers mention trust as an important criterion in choosing retailers. LD6 buys exclusively at Biocoop:

*I trust Biocoop. It's in their charter to try to supply local products, so I trust them.*

LD buys some products at Biocoop:

*I like them philosophically speaking. Their products are good and their prices are not excessive. It's a cooperative, already this is interesting, they do not try to sell at any cost. We are not bombarded with the display of promotions in the store. Also, concerning the environmental aspect, I do not need to lean over each label to find out what's inside and where it comes from. LD7*

#### 4.1.2.2.5 The ethical consumption

This thematic field is directly correlated with individual consumer preferences as it is also explained by values, beliefs and other personal and interpersonal factors and shaped by external determinants such as social and cultural norms, knowledge, etc. However, we decided to discuss it separately and to highlight it. Concerns and practices of a “**conscious and responsible**” consumer were brought up by 11 people.

We consider here as ethical a mode of consumption having various motivations: social, environmental, religious, among others. Many factors linked to ethical consumption emerged during the interviews. Each consumer gives a different importance to it.

This dimension aggregates the logic of consumers that are often called in France as « **consom'acteurs**<sup>28</sup> » (consumers-actors), consumers that find in a responsible consumption a way of acting ethically.

A study on sustainable consumption by GreenFlex (2016) concluded that the majority of French people want to express their social and environmental engagement through their consumption. The study resulted in a typology of consumers that indicates a renewal of consumer interests compared to 2015, with the social being in first place among the commitments. This typology also reveals that each consumer undertakes consumption in his own way, according to his “made-up” model of society. It suggests groups where there is a convergence in the interpretation of “useful and responsible” consumption, highlighting the increasingly significant fractures between the different groups.

The consumers we met referred to socio-economic and environmental issues. The main issues and concerns identified are: environmental impact, fair trade and a fair revenue to the producer, animal welfare, waste, among others.

##### 4.1.2.2.5.1 The effect of the ethical consumption on food shopping practices

This thematic field helps to explain the choices made concerning where and how the consumer buy food - the choice of retailers, how to access them, frequency of shopping, etc. The

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<sup>28</sup> *Consommateurs-acteurs*. This term is officially used in France by the governmental authorities, like the Ministry of Agriculture and Food: <http://agriculture.gouv.fr/cest-qui-le-patron-r-la-marque-qui-rend-consomacteur>

more importance the consumer attaches to a “responsible” consumption, the greater the influence of this factor on his practices. Some **strategies** that contribute to answer this question emerged during the interviews: shopping on foot or by bike; supporting direct sales channels, food basket systems and other modalities of SFSC; doing most of the shopping in the most “ethical” retailer; reducing consumption in mass retail supermarkets; refusing to purchase certain products; choosing organic products; choosing local products; buying in bulk; etc. The reasoning behind some practices are further described.

HD5 is happy with the new **anti-waste grocery store** in Melesse. It is a store that offers unsold stocks from other stores at a lower price, with the aim of reducing waste. HD5 seeks to progressively include this store in her repertoire of retailers:

*I am very happy that the anti-waste outlet has arrived in my town. I want to contribute to its operation thus shopping there. There are daily arrivals of goods and they have an app on Facebook that updates their customers. So, it will change our shopping habits because we'll need to go there more often. If we want to take advantage of the anti-waste and then ensure that there is less waste, we must change our habits. We will organize ourselves, the family logistics will perhaps allow me to go there more often, as long as it is not constraining with children.*

**Buying local and organic products** is a way of action for some consumers. The purchase of organic products or the produce of the *agriculture raisonnée* is mentioned as a response to some of the environmental issues, as well as the purchase of local products, which also addresses some issues for example through the reduction of the carbon footprint, with the additional advantage of benefiting local farmers, as MD2 explains:

*In the market I buy local and seasonal products. Because they have traveled less, and because they're have more freshness. And to be nice to the farmers too. And then there is still, “how do we say? How do you call it? The carbon imprint?” I do not know. But that's the reason, they have traveled less. MD2*

LD7 compares also organic and local:

*I give preference to the locality over the organic because I come from a family of farmers, not organic farmers, so my first impulse is to buy local because, if they're not their products, they're the product of people like them. The idea of the organic is nice, but it's more distant for me.*

HD1 believes that the **short food supply chains** correspond to a model of fair trade and an interesting option to guarantee a fairer revenue to farmers:

*In peasant shops, they [farmers] get together, the sales are directly from the producer to the consumer and it's true that it's nice. It's particularly good for their personal income that we know is low despite the subsidies. So, if the money can go directly to them rather than to the owner of the neighborhood Carrefour, it's better. Ideally it would be better to grocery shop at the AMAPs, ideally organic. We could buy all the food there, that is meat, cheese, vegetables and all, ideally through the short circuits.*

This consumer finds that it remains **difficult to find food retailers that are entirely adequate** to the model of consumption that he pursues. He feels forced to weight the impacts of his choices (for example, on the environment) in order to decide which factors to prioritize:

*Between organic and local I am almost more tempted by the local. Well I'm not for pesticides and all that, but finally when it's organic but produced far away and that we transport by truck leaving a high carbon footprint, it is not necessarily better. Ideally It should be local and organic, but that's not very easy to find. HD1*

**A fruit and vegetable basket system** with delivery at the workplace was an alternative more coherent with his values, but he decided to stop it after two years because the food basket was not organic. This consumer didn't think that that the effort/benefits ratio "for the planet" was balanced:

*If I am going to take this step, it annoyed me to do it halfway. HD1*

At the present time, since he didn't find an option congruent with his values at his fingertips, he shops at the supermarket. The proximity factor, at this moment of his life, plays a more important role than the consciousness factor: he does not want to get across the city to buy food products. It would be too big an effort.

Other consumers give preference to **organic stores**. Having a car simplifies access to this type of outlet for LD6, who has been doing his grocery shop at Biocoop for twenty years:

*I prefer to give preference to this kind of retailer than to mass retailers eh! I do not want to defend, as a consumer, supermarkets chains like Leclerc, Carrefour and all that. So, the less I go, the better it is from a philosophical or ethical point of view.*

An in the comparison between the consuming local and organic, which criteria should be underscored? Which products? This does not seem to be an easy choice, as explained by LD9, 23 years old, employed and living with a flatmate:

*Ideally it should be organic and local. Well in real life I know this is not entirely possible [...] I think that organic is more important than local but I could not give a definitive opinion. Because I never asked myself this question. I do not know much. The eco-friendly choice I mentioned earlier is a bit like the idea of buying more organic and more local especially because organic and local is eco-friendlier, but I also think it's more ethical if we buy local products because we help the peasants to receive a better wage, well, 'cause they're exploited by the multinationals we hear about recurrently*

This consumer recognizes she buys things that come from far away: *I still buy things that are not produced in France, including bananas and kivis, I love them. Well that in France we can't have.* For other products, such as yogurts, local options used to be offered at the store where she shops. However, the supermarket has stopped offering these products, so she is no longer able to consume local yogurt:

*At one point I tried to buy local yogurt too. Big yogurt pots, that I knew were made locally and so I really liked it, but they stopped. So, I can't do it anymore. But that's the kind of product I'd like to find where I shop.*

LD9

This remains a **need that her favorite store cannot meet**. This consumer highlights the idea that the store that can limit her choices when she explains which organic products she buys: *organic I try to buy fruits and vegetables. Because it is the offer that is available at Leclerc in fact.*

LD7 states **being local and organic are criteria that play a role, but that it is not necessarily a priority** among all the criteria that play a role when she buys food:

*I favor the locality over the organic but yes, I pay attention to that. But this is one criterion among others. I am not particularly scrupulous about buying something that comes from far away if it is of better quality or if it costs really really really cheaper.* LD7

Instead, other consumers defend the significance of making efforts to consume according to their values. They mention food choice as a **political act** and state that each person has to his contribution, to fight and battle, to be a « *conso'battant* » (consumer-battler), as explains LD5:

*We are so much under the sway of the agri-food system. I also recognize, 10, 20 years ago I was much more under this control. It takes a lot of effort. And you have to do it. It's an effort. I say to myself that there are other efforts that we make but that are not more important than this one. I think we have to make efforts, we have to fight. I believe in this, [like says] Pierre Rabbi, it's a small dose, everyone does a little bit. Everyone his little contribution. Choosing what to eat has become a political act I think, there is something of the order of politics.*

Indeed, the list of factors and elements that articulate to shape what is a conscious consumption for each individual is not exhaustive. We believed it was important to emphasize this sphere which refers to an increased awareness among consumers in a context of growing societal changes. Ultimately, the question that may arise is: **how far can the consumer go in his effort to ethically shop for food?**

#### 4.1.2.3 A system of constraints that determine the food purchasing practices

Through the analysis of the thematic areas done previously, we described the factors which together constitute a **system of constraints that is unique to each individual**. Constraints imposed by the spatial location of the food retail environment are part of this constraint system that has an effect on purchasing practices.

As an example, we show some factors are cross-referenced in Table 3. The table positions the consumers surveyed in relation to the mode of transportation used for shopping, to the household time constraints and to the food retail environment available near home (IRIS of residence, representing the spatial location constraint). Overall, shopping by car is more common

among consumers living in low density retailer IRIS with medium to high time constraints, while among consumers residing in high-density IRIS the car is less usual.

By categorizing the surveyed territory according to the quantity of available food retailers, we tried to objectify the food retail environment and its geographical distribution. However, this “**objective food retail environment**” does not necessarily reflect the **perception** that people have of it. We have found that they can overlap, that is, the objective environment and the perceptions of it may coincide, but not for all consumers: perceptions of the same local food provision vary depending on the person. Also, it is important to say that we have only categorized the food retail environment of the place of residence of the consumers interviewed.

Table 3: Percentage of people interviewed concerning the mode of transport for food purchasing, the time constraints and the food provision available in the IRIS of residence.

	Food shopping by car	Food shopping by public transport or bicycle	Food shopping by walking	
Low density	20%			High time constraints
	5%	5%		Medium time constraints
		10%	5%	Low time constraints
Medium density	10%			High time constraints
	5%		5%	Medium time constraints
			5%	Low time constraints
High density			5%	High time constraints
		5%	10%	Medium time constraints
	5%			Low time constraints

Therefore, based on the consumer's perception of the food retail environment, we could categorize it as adequate or inadequate. In other words, the food provision is judged by each consumer as **adequate or inadequate in relation to an ideal situation of availability and accessibility of food retailers**. This ideal situation is determined by the set of factors previously described in the thematic fields (the financial means, the routines of daily life, the conditions for mobility, the personal preferences and the ethical consumption).

We have assessed this adequacy according to the **description of the ideal situation** in comparison with the perceived retail environment by the people interviewed in their daily activity spaces (territory of life): close to their homes, to their regular transit routes and to their workplace

or other activity places. In some cases, the food provision available in their activity spaces was considered adequate by the people surveyed. Conversely, in other cases, the it was considered inadequate. **The more the food retail environment seems inadequate to the eyes of the consumer, the more the logic of spatiality in which he is caught is constraining.**

With regard to **characterizing the food purchasing practices based on the available food retail environment**, we have identified that people explain their strategies as an **adaptation** (people adapt to the food provision available in their activity spaces and shop at the available food retailers); a **deprivation** (because they are not able to access the food retailers they would have preferred, people feel deprived); an **extension of their daily space-time** (to shop in a way that is closer to their ideal). This extension incurs in **efforts** (which have financial and time costs).

The **repertoire of food shopping practices** is very broad and there are multiple options. We tried to highlight the main practices and strategies used by consumers for each ideal types.

#### *4.1.2.4 The ideal types: an analysis of the food purchasing strategies in response to the food retail environment*

We have constructed the ideal types with respect to the possible ways to answer to the question: **which food purchasing strategy is used in response to the geography of the food retail environment?** This construction helps with the exercise of objectivation while keeping the subjectivity. The results are specific to the chosen comprehensive approach. A different approach might have yielded different results.

The analysis of the answers of the respondents led us to the definition of four ideal types. Table 4 groups the profiles and describes them according to the existing food provision around the place of residence, the perception of the food retail environment in the activity spaces and the strategies deployed.

We reflection upon the system of constraints more relevant for each ideal type. Nevertheless, we were not able to identify a socio-demographic profile specific to each ideal-type. The system of constraints that plays a role, and we have already discussed the importance of the characteristics of the household concerning the constraints (for instance, households with children may have greater time constraints, higher occupational categories may have lower budget constraints and so on). The situation of constraints is associated with all the variables that play a role in each household. Consumers of each ideal-type thus have different profiles: single people or couples; with or without children; homemakers, employed or retired; various occupational categories and educational levels, etc.

Table 4: The ideal-types created:

Ideal types	« Almost everything near my home »	« As much as possible in my territory of life »	« Forced to leave my daily territory of life »	« I expand my territory of life »
<b>Food retail environment around the area of residence</b>	Medium density High density	Low density Medium density	Low density Medium density	Low density Medium density High density
<b>Perception of the food retail environment in the territory of life</b>	Adequate or almost	Adequate or almost	Non-existent Inadequate	Non-existent Inadequate
<b>Strategies</b>	Occasional effort: Adaptation Occasional extension Sometimes deprivation	Balanced effort: Adaptation Minimal extension Sometimes deprivation	Great effort: Extension Sometimes deprivation	Trade-off effort: Compensated extension

#### 4.1.2.4.1 « Almost everything near my home »

##### 4.1.2.4.1.1 An adequate food retail environment or almost

For this consumer, the existing food retail environment in his territory of life is considered adequate or almost adequate to what would be ideal for him. His place of residence is located in neighborhoods or IRIS where there is a medium density or high density of food retailers at hand. He can therefore purchase food near home. This consumer adapts to the food provision available, with occasional extensions of his daily space-time (occasional trips elsewhere in his territory of life or outside of it). These efforts are occasional. Nevertheless, if he can't make an effort, for various reasons, this consumer reveals a sentiment of deprivation due to the incompleteness of the food retailing available (if he'd prefer, for example, more diversity of foodstuffs, more quality, etc.).

This consumer tends to make his choices within the limits of the food that is on offer - proximity being often one of the determining factors of his choice, the perception of the retail environment is, to a certain extent, determined by the advantages of having retailers close-by. The spatial constraints related to the geographical distribution of the outlets are therefore minimal in the system of constraints of this consumer. The constraints linked to the conditions for mobility depend on the physical capacities to transport the groceries, on the local infrastructure (ex: bicycle

parking area), among others. The system of constraints is associated with all the variables that play a role in each household.

#### 4.1.2.4.1.2 All on foot or by bike

This consumer usually does all his food shopping walking or by bike not far from home. Travels elsewhere are normally done by car or bus, but occasional or rare. He chooses active travel, if not restrictive. In addition, walking and cycling have the advantage of being a physical activity or a relaxing time. But, he has groceries carry back. If he does not own a car, he tries to carpool or to borrow a car. Otherwise, the stores to which he has access during these occasional extensions depend on the public transport network, on the road conditions to do it by walking, among others.

#### 4.1.2.4.1.3 The repertoire of food purchasing practices

Shopping equipment - trolleys, carts, shopping bags, backpacks, saddlebags and even strollers - are tools that help this consumer to transport his groceries back home. If he is well equipped, he can even cross boundaries that he wouldn't be able to if he was not well equipped. He can enlarge the distances. The volume and weight of the groceries, as well as the storage space available at home, partially determine the frequency of purchase. Routines play a role too. If the consumer lives alone, he can more easily fit food shopping in his routine than he probably would if he had children. The constraints due to the routines will therefore justify the frequency and the choice of outlets. Either he establishes a day for shopping, or he does it irregularly or when there is nothing left to eat at home. If he has no time constraints, he benefits from more hours to shop. Having a supermarket with extended opening hours benefits the consumer who has high time constraints. He can ask for someone's help (ex: sharing this task within the couple, asking relatives and other family members to buy certain products, etc.).

Having a neighborhood supermarket nearby represents a significant gain in convenience, even if the choice (product lines, brands, novelties, etc.) might be more limited and the price higher than in larger supermarkets. This is offset by the extended opening hours and by proximity. The consumer adaptation is also explained by his economic means and his personal preferences.

This consumer therefore gives preference to the food retailers close-by. What's the limit to the efforts made to shop for food in a way that is closer to what would be ideal for him? It depends on the system of constraints particular to each individual. If the effort is not worth it, he adapts to the food that is on offer. If he an occasional effort is worth it, he does an extension of his territory my means of a strategy. The strategies used are varied: going to supermarkets and hypermarkets, using the click-and-drive system, going to organic grocery shops and open-air

market, etc. There is not a general rule, but in general this consumer uses a strategy that minimizes his effort, for example, by storing non-perishable food at home so that he can grocery shop less often. A common practice is going to hypermarkets in the periphery of Rennes for the “big food shopping” because the products are cheaper than at the neighborhood supermarkets. The advantages of neighborhood supermarkets are the extended hours, some open even on Sundays. The food retail environment can be more or less diverse depending on the neighborhood. In neighborhoods with more restricted food provision, the sentiment of deprivation may be stronger. But even in situations where food outlet options and the products offered are diverse, it does not necessarily meet all his needs.

#### 4.1.2.4.1.4 Typical portrait: « Almost everything near my home »

HD1's home is located in Dalle de Colombier, IRIS with a high density of food retailers in downtown Rennes. He shops at the supermarket located near his apartment when he doesn't have *anything left to eat*. He also buys some products at a frozen food store a few minutes away from home, but very rarely. It's mainly burgers and chicken breast because he trusts the products of this store chain. Since he has a large freezer, he buys in large quantities and stores it (*this way I go back less often*). Frozen foods *are less likely to perish* which is good because *I do not like to waste food*. If he buys bread, it's at the bakery. When he invites friends to eat at his place, he buys cheese at the cheesemonger. He works next to the Longs-Champs commercial center, where he buys his sandwich for lunch every day.

HD1 is doesn't like to go to the big retailer and *huge hypermarkets* where he used to go with his mom when he was little: *I think it's too big, extremely big, really that is not human anymore. We are distracted by everything that is showcased [...] we really see this system of consumption, it's so obvious in mass retailers. I do not know, it's hard for me to go there, it's a marathon.*

During a period, he purchased a food basket that was delivered to his workplace: it was a *big bonus point, and I had a choice among 25-30 products*. The basket was composed mainly of local products, but it not organic, so he ended up cancelling it because it annoyed him to do it “halfway”. He hasn't found an option to replace the basket, which has clear consequences on his diet: *I do not eat a lot of fruits and vegetables, it's not because I do not like it, but it's because I do not have the reflex. Taking the basket pushed me to eat them. And it's true that now that I don't buy it anymore, I eat much less. This is the good side of getting baskets, I must start doing it again because I used to eat more fruits and vegetables.* This lack of “reflex” is linked to the fact that he does not like the products offered by mass retail chains: *by default, I have a bad image of fruits and vegetables of mass retailers, so I don't even look to see what's available. The things that bother me the most are the tomatoes from Spain that we see everywhere there.*

HD1 goes sometimes to the Lices Market on Saturday morning because he likes to meet producers, but he is seldom in Rennes on the weekends and he lacks in motivation:

*I do not go there. But I would like to. It's the same problem, the fact that I cook for myself, I do not have the courage. The food available at the market is the best, it's fresh. It's nice to see all the products displayed, to talk a little with the merchants. But just for myself I don't feel like making an effort. When I'll live with my girlfriend, I think we'll make more efforts to take the time to do that.*

Even though there are many options of food retailers, the situation does not exactly correspond to the ideal situation for this consumer: *the ideal would be to be part of AMAPs, ideally organic, or peasants' cooperative shops*. Because he does not feel like making an effort to find other options that correspond to these expectations, this consumer is seized by a sentiment of deprivation. He feels deprived of certain products (fresh fruits and vegetables) and forced to shop in a way that does not quite corresponds to his values (fair remuneration of the farmers, support organic agriculture). He plans to make this effort in the future: *My determining criterion is proximity. We will say that at the present time, even if it's not what I would prefer to do, it is what is more practical*.

Finally, he confirms the diversity of the food provision available downtown and demonstrates self-criticism: *There are many shops, everything is accessible, there is not much problem. However, I go to the nearest outlet whereas I could go elsewhere because there are plenty of others. But it's a way of life, I think. I am used to having everything nearby, so I go to the closest. I think there is a good food provision and it's me who does not make the effort to get to know it. It turns out that there are plenty of things close-by, where I could find stuff that I prefer but I do not make the effort. I do not want to do it I think*.

#### 4.1.2.4.2 « As much as possible in my territory of life »

##### 4.1.2.4.2.1 An adequate food retail environment or almost

For this consumer, the food retail environment available in his territory is considered adequate or almost adequate to what would be ideal for him. Even if he lives in neighborhoods or IRIS where there is a medium density of food retailers, a low density or even a food desert, in the totality of his activity spaces - work, school of children, travel routes - there are food retailers available. He can therefore shop in his territory of life. He moves away from his place of residence to obtain food, but remains primarily within the boundaries of his usual territory. Because of this, the larger the territory, the larger the choices he might have.

This consumer adapts to the food retail options available in his territory of life, with minimal extensions of his daily space-time (trips outside of it) to grocery shop. These are therefore balanced efforts because traveling outside the usual territory of life is in itself an effort: the effort of using a car, of taking the bus or the bike to go further, to carry the groceries, etc. If the food retailers are not entirely adequate, this consumer make efforts to go elsewhere to shop for food. Nevertheless, if he can't make an effort, for various reasons, this consumer reveals a sentiment of deprivation due to the incompleteness of the food retailing available.

This consumer tends to make his choices within the limits of the food that is on offer - proximity being one of the determining factors of his choice, concomitantly with accessibility - linked for example to the existence of parking lots, bus line, bus stops, etc. He can experience constraints related to mobility.

#### 4.1.2.4.2.2 The usual mode of transport

The mode of transport used by this consumer is primarily the one he uses daily. Shopping with a car makes it easier to transport his groceries compared to the bike or the bus. The choice of the mode of transport is also determined by the time constraints. In general, this consumer lives in areas where food provision is limited, or in a rural area where people are commonly dependent on cars.

#### 4.1.2.4.2.3 The repertoire of food purchasing practices

Among the strategies for optimizing the time and money resources, this consumer benefits from coupling or sequencing food shopping with other activities. If the food retailers are not directly accessible near their activity places, he makes a small detour. He can choose to shop at several places or to focus on one.

If this consumer lives alone, it's usually easier for him to organize his routine and activities compared to households with children. For example, the school schedule is an additional constraint for parents: they need to drop off their children and pick up respecting the school hours. Also, grocery shopping with accompanied by children can be difficult. Sharing the food shopping task within the couple can help to reduce time constraints. The click-and-drive is a common option for this consumer, if he owns a car: he orders online beforehand and stops at the collection points to pick up the groceries. This possibility also depends on the location of drives in the person's territory of life. If he relies on the public transport system, he is more restricted by the bus lines. He can set up a food shopping routine. The place of residence remains a central reference, the sequencing work-grocery shopping is often done at the end of the day.

#### 4.1.2.4.2.4 Typical portrait: « As much as possible in my territory of life »

The place of residence of MD4 is in Saint Louis, IRIS with a medium density of food retailers. He tries to grocery shop at the end of the day on his way back home after work, as well as his wife. Both work in the outskirts of Rennes, so they have the option to go to hypermarkets and supermarkets that are located there. For him, the choice of places is mainly based on proximity:

*I work outside Rennes, so I can do my shopping on my way home from work. It's not very practical sometimes, but I stop to buy things. And my wife works in the north of Rennes so by bike or train she can access a lot of retailers.*

The same applies to the food basket system he gets:

*We are also subscribed to an organic food basket, which I collect because I do an activity around Beauguegard, so I get the basket near my activity.*

He also shops at a Biocoop near his house and at the bakery. Shopping at different stores reduces the amount he has to buy at the Lices market on Saturdays. Since he and his wife have two children, they have a great quantity to carry:

*So, it's super convenient because the food basket we on Thursday and it allows us to have less things to buy on Saturday. At the market there are many people from all Rennes coming and many tourists and all that, and when we have to go fast, sometimes we do not have much time, so it's good when there's less to buy.*

He chooses not to go to another market close to him, the Mail market, that is opened Wednesday afternoon and evening, because he thinks it's too expensive. MD4 points out that he tries to give preference to some organic products:

*We have the impression that there are fewer benefits from eating organic meat than organic vegetables. But it's an impression, it's not very rational hub. Because we suppose that when we eat a strawberry, for example, which was produced with pesticides, it's very good because we eat everything in the fruit. When we eat a banana, it is not the same because there is a thick peel around. It's disguised.*

There is a neighborhood supermarket not very far, but I use it for small shopping, for “troubleshooting shopping”, because as he shops at larger supermarkets at the outskirts of the city. For him, the ideal would be to have more small food retailers, more traditional food shops, shops, in his neighborhood:

*In the neighborhood there are no food stores really close-by. Apart from the bakery. It's great to have a bakery. We wish we had a small greengrocer, for example. We haven't had one since. Along time. It seems they have opened a delicatessen not far, well a deli shop is good, but it does not have the basic things we need for everyday life.*

#### 4.1.2.4.3 « Forced to leave my daily territory of life »

##### 4.1.2.4.3.1 A non-existent or an inadequate food retail environment

The food retail environment in this consumer territory of life is non-existent or inadequate to what would be ideal for him. This consumer lives in different IRIS and neighborhoods, and in his territory of life there is a medium or low food retailer density, or even a food desert. If there are food retailers, they are inadequate. Because he does not shop for food near his usual activity spaces, he has to shop outside his territory, which requires considerable efforts. Sometimes this consumer reveals a sentiment of deprivation due to the limits of the food retail environment: even by making an effort, the food provision to which he has access can be still limited compared to his ideal in terms of food shopping. The sentiment of deprivation can therefore exist concurrently with the sentiment of effort. The proximity and physical accessibility of food outlets play an important role for this consumer who is constrained by geography. They can be summed up with mobility constraints.

#### 4.1.2.4.3.2 Taking the car is the easiest way

For this consumer, the car is often the most convenient means of transport to have access to food retailers located outside his activity spaces: it extends access to a further and broader food retail environment. If he does not have a car to use for shopping, public transport can replace it, despite the fact that it adds an extra effort (carrying the groceries along the way, waiting time, etc.). The volume and weight of the groceries he is able to carry are often inferior to the quantity he would be able to carry by car. Besides, depending on the location of his residence and workplace, this consumer must use more than on bus and lines. This consumer can also rely on cycling or walking, the physical effort being an additional constraint.

Notwithstanding, if the car brings convenience compared to other modes of transport (time saving, not having to carry the groceries along the way, etc.), using the car can be *per se* an effort for this ideal type. Either he uses it almost “automatically” or “naturally”, without continually thinking about it, or he sees it as a sacrifice in itself, but he does not find alternatives and he doesn’t think it’s possible to go purchase food without a car. The use of the car is therefore seen as a tool that ensures convenience or, conversely, as a drag he wishes he could get rid of.

#### 4.1.2.4.3.3 The repertoire of food purchasing practices

Because this consumer is forced to leave his territory of life, he prefers to shop in one single or a few food outlets where he can “find everything” or in places close to this territory. Commercial zones on the outskirts of Rennes correspond to this type of shopping practice because of the car-oriented infrastructure, which discourages the consumer using other means of transport. The constraints related to mobility therefore play a central role in the supply practices of this ideal type. If he rides his bike to supermarkets outside the city, this requires physical effort, and to make the task easier it’s better if he is well equipped (backpacks, saddlebags) or if he can rely on someone's help. To reduce the frequency of shopping, this consumer sometimes stocks food. He often does “big food shopping” at larger supermarkets and small shopping closer to his territory of life.

This consumer also goes to the market, but the schedule is often restrictive if he works. If he lives further away from the city center, for example, going to the Lices market downtown is not an easy task because it's hard to park, it takes time. People relying on public transport have also the weight to carry and as an additional constraint.

This consumer can also go to markets in cities outside Rennes if he has a car. The click-and-drive remains an option that has advantages that this consumer appreciates, especially if he has a large family and high time restriction, even though the choice of drive is more limited than

the physical store. Home delivery is another option this consumer can use, and that is particularly important for people with physical limitations. Finally, setting up a food shopping routine and to go shopping in the company of other people are strategies to relieve the weight of shopping (having company and the help of someone who can also carry the shopping bags).

#### 4.1.2.4.3.4 Typical portrait: « Forced to leave my daily territory of life »

MD5 lives in Le Gast Est, IRIS with a medium density of food retailers. Near her home there are food retailers, but the lack of choice and freshness and the prices make her choose to buy foodstuffs elsewhere. With her husband, she established a routine for food shopping: every Saturday morning with their three children. They go to the Intermarché of the Long-Champs commercial center. She completes the household grocery shopping with one trip to the Gast market on Tuesday morning for fresh meat and, eventually, vegetables and fruit too, but not always because she lacks of trust: *I was a little disappointed because I was surprised with rotten fruit in the grocery bag that a merchant had sold to me. It has happened a few times.* This is similar to a situation she often finds at Intermarché, and that does not please her: *when we do not pay close attention, we sometimes get rotten fruits. They are not very careful with their fruits and vegetables I think.*

That's one of the reasons why she goes from time to time to Leclerc Saint Grégoire: *it is a little further, but I have the impression that the vegetables are better kept, and that it's cheaper, but finally it's a bit of the same.*

On Fridays she goes to the Super U Rue de Fougères, accompanied by her mother, to look for fresh fish and other things, if necessary: *I take some vegetables if needed, when they [husband and children] have eaten all fruits, I buy more fruits.* As she will soon return to work, she hopes to continue shopping on Saturday morning with her husband. She will also try out the click-and-drive as she will not be able to go the market nor the Super U during the week anymore: *it is the constraints caused by work.*

Eating fresh is a priority for MD5, but also a difficulty. At one point, because she was *disgusted with the fruits and vegetables of mass retail supermarkets* and thanks to the advice of her doctor, she tried out the Grand Frais (a large supermarket focusing mainly on fresh products) in Cesson (a municipality neighbor of Rennes), which liked. But she goes there very rarely because of other constraints: *because it's much farther away and more expensive, currently we do not have the budget to shop there.*

She also shops at the new bakery of the neighborhood, which has recently opened: *Before we bought frozen bread that we defrosted, so finally we ate less bread. Now that we got a bakery, we will eat more bread. It's convenient for us, we like to have fresh bread, besides they make good bread!*

MD5 wishes she could go shop directly at the farmers, to harvest and pick up her own fruits and vegetables: *we would gain in terms of price and quality.*

#### 4.1.2.4.4 « I expand my territory of life »

##### 4.1.2.4.4.1 A non-existent or an inadequate food retail environment

The food retail environment of this consumer territory of life is non-existent or inadequate to what would be ideal for him. If it's inadequate, this consumer does an extension of his territory of life, compensated by the fact that he can shop in a way (in the retailers he wants and with the products he wants) that is closer to his ideal. It is an effort that is "worth it" due to the importance of food shopping for this consumer. This trade-off effort is assimilated into the routine of this consumer: it is a compromise between the costs and the loss in convenience and the benefits he gets from it (eat according to his tastes, interacting with producers, supporting sustainable agriculture, benefiting from promotions, reducing pressure on budget, etc.). This extension of the territory of life is therefore compensated.

This consumer lives in IRIS and neighborhoods with different food retail conditions: high, medium or low density of food outlets, or even food deserts. Nevertheless, if there is a food retail environment in his territory of life, it is seen as inadequate by this consumer.

For this consumer, food shopping is a central activity or even a priority: he is very picky about the food retailers and demanding with regards to his priorities. If he can, he dedicates time to shop. He chooses meticulously where to go and what to buy according to different criteria (food preferences, available budget, values, priorities on how to spend time, etc.). This consumer does not experience a sentiment of deprivation, particularly in terms of physical access to food. However, the food retail environment is rarely completely adequate to this consumer notion of what would be ideal.

This consumer does not make choices within the limits of the food retail environment - there are other factors that play a greater role than proximity. He sees a compensation for the spatial constraints related to geographical distribution of the retailers or the conditions for mobility. Time constraints are not sufficient to prevent this consumer from expanding his territory of life.

##### 4.1.2.4.4.2 The mode of transport available

This consumer generally uses the available means of transport. If the time constraints are too strong, he can take the car to shop, if he has one. The bus or the bike are also common means used by this consumer. Since making food shopping is a priority for him, he tries to devote time to it and the means of mobility is not usually a limiting factor.

#### 4.1.2.4.4.3 The repertoire of food purchasing practices

Purchasing food can be a moment of pleasure for this consumer. For example, if he is retired, shopping is also a moment to see and discuss with people, to walk around, to go out and not stay at home. He can do the same shopping circuit regularly because he already knows the sellers, he is used to the products, he has created a relationship of loyalty with some merchants. The advantage of day-to-day shopping is being able to benefit from good deals, for example. Having flexibility to go shopping also allows him to go to the supermarket according to promotions or new arrivals (announced of products on the retailer's websites).

Given that this consumer makes the choice to expand his territory with food shopping having a central position, he chooses the food retailers in a meticulous and critical way and several factors play a role (quality for price, image of the store, choice, etc.). If the consumer has more free time, he can go to several places. If he uses the public transport system, his priority retailers are the ones that he can have easier access to. Pick-and-drive and home delivery are not commonly used by this consumer, who prefers to have the choice and to shop personally.

#### 4.1.2.4.4.4 Typical portrait: « I expand my territory of life »

HD4 lives in an IRIS of high density of food retailers. In his territory of life there is a diverse food retail environment, but he prefers to shop elsewhere in order to buy the products that correspond to his preferences and priorities. He is a student, and, at certain times of the year, he works part time. But even when time is more constraining, he always gives priority to food shopping: *I have no children, I take my time, If I arrive home at 9PM it's okay.*

Getting food is important to him, so the effort is compensated:

*When it's evening and you have to go to the supermarket, I'm happy. I arrive at Intermarché, I see the food, I'm happy. Going to the supermarket is not a burden, I'm happy when I go to the supermarket. I'm happy when I do it, you're happy with what you're going to eat, with what you'll be able to prepare and all that.*

He buys most of his food at two supermarkets in the periphery of the Rennes, where finds most of what he wants. Vegetarian and very concerned about his health, he composes his food basket rigorously and remains meticulous with regards to the products he buys:

*I go to Intermarché and Leclerc for the quality in fact, because I buy organic fruit and all that. You have more choices. And after that there's a brand that I like at Leclerc, it's Yogi Tea. I find it at the Intermarché too but there are fewer options and lines of products, there are not many novelties and all that. And at Leclerc, of course, there is the organic shelves, with seeds and everything you can buy in bulk and I like when it's like that. At Intermarché too. But there are no chia seeds. Well, there is always something missing, so you have to complete somewhere else.*

HD4 does not have a fixed frequency, but he has to shop regularly to buy fresh products and because he runs out of food quickly:

*We have a physical space issue, we are students, we do not have large refrigerators. Storing food is complicated. Especially vegetables. It finishes quickly.*

HD4 enjoys cooking a lot, he learned at home when he was younger. He rarely eats outside. While he's having dinner, he prepares his lunch for the next day. This is one of his priorities:

*How long do I stay? An hour and a half in the kitchen to eat and prepare my food. It's my little thing. I like to take my time, to eat slowly you see. I am often the last [among his roommates] to leave the kitchen.*

He does not shop at the bakeries or other small food shops because he thinks it's not a habit: *In Martinique it's not like that, I lived there for 18 years, so I'm a little conditioned. We do not eat a lot of bread.* Since he does not eat meat, he does not go to the butcher's. At the neighborhood food retailers, he shops mainly for buying little things that are missing.

#### 4.1.3 Hypotheses verification

- The main hypothesis stated that the consumer is free of choice to the extent of the food that is on offer in his territory of life and to the extent of his space and time constraints, and that when the food retail provision is diversified in the daily space-time the consumer inhabits, he has free food choice and the geography of the food retailers does not interfere with his food shopping practices. If the food retail provision is restricted, he has restricted choices.

Our study supports partially this hypothesis. Our results lead us to believe that the food that is on offer in the consumer's territory of life plays an important role in influencing his choices and food purchasing practices, together with other factors that also determine the system of constraints existent in his daily life. In situations where they have more options to choose from, they will have more freedom of choice. However, it does not seem that the consumer is completely free of choice, as his needs are not necessarily all met by the food retail environment. Determining if the food provision is diverse or not diverse is not necessarily an adequate measure as it should be compared with what diverse means to the consumer. This measure should be compared to the perception of consumer and if it is adequate or not to what would be an ideal for him – and this ideal can be more diverse. Overall, it seems like in the area studied in Rennes there is some flexibility for consumers in the study area. Yet, if the consumer wishes to purchase mainly “sustainable products”, it seems like the food retail environment does not meet all needs. The effect of the spatial factor is interwoven with the effect of other factors.

Having restricted choices will also depend on the conditions of the ability of the consumer to respond to the geographical constraint. For example, people who have more time constraints may not be able to deploy a strategy to overcome the spatial constraints. The ideal types built help us to understand the complexity of choices of consumers.

The spatial location of food shops can be a constraint that can restrict consumers' choices. Oppositely, the food retail environment can be an enabler of choices, especially if it is perceived as not constraining. Nonetheless, our results lead us to believe that the geographical constraints have to be always considered together with other limitations. Also, they can potentiate or soothe the effect of other constraints. In other words, the food retail environment can be supportive or not supportive of choices.

The other hypotheses were:

- The spatial location of the food retail outlets around home plays an important role in determining consumers food shopping practices.

Our study leads us to confirm this hypothesis. The residence remains the main place of reference for most people when they have to decide on where to purchase food. The food has to be stored at home, many products are fragile and perishable, like dairy products and vegetables, etc. The place of residence remains therefore the point of reference when consumer reason the distance to the food retailers.

- The spatial location of the food retail outlets around the workplace plays an important role in determining consumers food shopping practices.

Our study leads us to believe that this is not true for all consumers. It will depend on different factors, like the means of mobility and the daily routines. It seems like for people having a car, the food outlets available around the workplace (or other activity places) could play a more significant role than for people who rely on walking and bicycle as means of transportation due to the issue of carrying the food from the shop to home. The food retail outlets around the workplace can play a more important role if the consumer lives in an area of low density of food shops. However, many consumers did not seem to know well the options available near their workplace. Most knew mainly the options they were directly exposed to when reaching work.

- The spatial location of the food retail outlets around the transit routes plays an important role influencing the food shopping practices.

Our study leads us to believe that the transit routes play an important role as they potentially expose people to a larger number of food retailers when people are traveling between activity places (ex: while commuting). The transit routes are a way through which the consumer is exposed to shops, especially if the shops can be visually located by the consumer. However, if accessibility to retailers is difficult (ex: absence of parking lots or bus stops), people might not purchase food at these places.

- If the food retail provision available in people's territory of life is perceived as inadequate, people develop strategies to procure food otherwise and/or elsewhere, which incurs in an effort. Individual factors and socio-cultural norms and values explain the efforts carried out.

Our study does not allow us to entirely sustain this hypothesis. Some consumers that perceive the food retail provision as inadequate do not develop strategies to overcome this limitation. In some cases, they will feel deprived from purchasing the way they wanted because they cannot develop a strategy to procure food otherwise or elsewhere. The efforts that the consumer can make and the strategies he can deploy depend on the system of constraints (for example, if he has children and less time, he might be more limited in the effort he can make when compared to a person living alone, or a person with a higher salary might have less money constraints when compared to someone unemployed), that are the result of many factors. Individual factors (ex: education level) and socio-cultural norms and values are indeed among the explanatory factors of the efforts made. The ideal types built reflect the way people can respond to geographical constraints.

## 4.2 Discussion

### 4.2.1 Limitations of the study

There are several limitations to our study. The first one is that the study was geographically limited to one part of the city of Rennes, which limits any generalizations to the whole city, that has broader range of socio-demographic profiles. Besides, the metro is not a representative means of transportation in this area. Also, the characteristics of the physical food environments are diverse in every IRIS and neighborhood of the city. Furthermore, the research was also conducted only in a few IRIS of the city of Rennes. The number of participants interviewed does not necessarily reflect the general population of Rennes. We would recommend it to extend the scope of the research to the whole city of Rennes and also to the surrounding municipalities located in the urban area of Rennes. Another limitation is linked to the fact that the secondary data used to categorize the territory. Databases and commercial listings of food entry points, particularly of food retail outlets, are not necessarily up to date and that it does not always correspond to the complete real offer that consumers have access to.

Due to constraints in terms of time and resources we would not have been able to extend the research to a larger area. The transportation modes of the researchers were mainly walking and bicycle and the bus was also eventually used. This limits also the physical area that can be attained by the researcher in a certain time. Additionally, we experienced recruitment problems.

Many people refused to be interviewed, some people changed the time of the interview and others scheduled interviews and cancelled at the last minute, all those factors increasing the time constraints. Lastly, the lack of experience of the researcher in conducting qualitative research can be cited as a limitation.

Another limitation of this study is the difficulty to limit the geographical boundaries of the territory of life of the consumers interviewed. The characterization of the food environment focused on the vicinity of the interviewees' homes, but people occupy a larger area due to their daily activities and are therefore exposed to a larger food environment. We were only able to consider in our research the perception of consumers about these food environments, which is a subjective measure. Including the exposure level in future research can allow us to compare and better understand the relation between objective environment and perceived environment.

Finally, another possible short-coming of this study is that we were not able to reach a sample of consumers that corresponds to the complete socio-demographic profile of the territory of study. People were approached randomly in the IRIS visited, at different times of the day and days of the week, but this was not sufficient to attain a sample that corresponds to the diversity of this profile.

Despite the cited limitations, this study holds significance for the research on food environments in urban areas. It reinforces the importance of using qualitative approaches in the research of physical food environments. It can contribute to a better understanding of how people reason the spatial dimension in the specific territory of study, providing insights and suggesting some ways forwards by outlining some points that will nourish the improvement of public policies.

#### 4.2.2 Policy implications

Based on our results, it does not seem that, strictly speaking, there are food deserts in the study area. Nevertheless, there are spatial disparities in access to food in the area studied. Some neighborhoods have indeed a more limited amount of food retailers, for instance. An important number of people complained about the lack of fresh food and of retail options to purchase local food. Measures such as the expansion of open-air markets to neighborhoods where they do not exist and the extension of the operating hours of markets could benefit consumers, as well as a better advertising of initiatives that support local and organic agriculture. Open-air markets operating on Sundays and late in the evenings could expand the access to more people. Also, incentivizing partnerships between employee representative committee and local producers for delivering options like food baskets at the workplace could also benefit consumers.

Our findings also shed light on the mobility issues. It seems that it is important for Rennes to improve conditions for public transportation and soft modes of transport (walking, bicycle, etc.). Cars are still the main mode of transportation used by people in Rennes. In 2007, only 4% of city travel were done by bicycle, 13% by public transportation and 28% by walking. Cars corresponded to 55% of travels. Users of public transport living further from downtowns complained that most bus lines converge only close to the city center and chaining different bus routes sometimes takes too much time. Users of the public bike sharing scheme complained about the limited number of stations to drop off their bicycles. Measures should take into consideration the current limitations. We also believe that enabling intermodal urban mobility, mainly through the combination of soft modes of transportation and public ones. Improving access to car sharing systems can also be cited a measure. A mixed-mode form of transportation generally involves using two or more modes of transportation in a journey. This seems to be key to amplify the food retail network people have access to and specially to alleviate the difficulties imposed by carrying shopping home and by the traveling itself. Rennes Métropole is preparing the 2019-2030 urban mobility plan (PDU<sup>29</sup>), through a participatory process for the 43 municipalities in its perimeter. This plan sets the organization of mobilities and the action programs that will be implemented. In terms of mobility, this plan could consider the challenges pointed out in this research.

People who are in conditions of disability, infirmity or have physical limitations to reach food shops and to carry the shopping bags can have their access worsen if no options like home delivery systems are available in their area of residence.

Food policies to improve the consumption of more sustainable food also tackle the problem of misinformation and of lack of information. It seems that there are very diverse conceptions of what organic food and local food is, as well as a broad lack of trustworthiness, principally on organic products, that are not always of good repute.

Finally, it is important that the city of Rennes continues to include the civil society movements in a bottom-up approach to its public policies. They should be context-specific: further studies should investigate the reality of the neighborhoods of Rennes in order to tackle the challenges accurately. Having options to buy food, and especially healthy food, seem to benefit citizens. Nevertheless, food access policies should account for the upstream causes of disparities in the access to food, like social inequalities and poverty.

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<sup>29</sup> <http://metropole.rennes.fr/politiques-publiques/transports-urbanisme-environnement/les-deplacements/>

## 5. Conclusions

Improving access to food in the urbanizing world seems to be a central strategy to ensure food security and improve nutrition and diets. Cities play a central role in developing food access policies. The food environment connects the supply system and consumers. Its physical dimension corresponds to the availability and physical access to food, particularly to the food retail environment, through which people can purchase food.

Food is a central topic for policy-making in the city of Rennes. The spatial distribution of the food retailers and its impacts on consumers food purchasing practices in Rennes were the subject of our reflection. This study documents the strategies deployed by people in response to the constraints that impact their food choices and shopping practices. Also, we provide insights that contribute to the debate on the impact of physical food environment on consumer food purchasing practices, and more specifically on the impact of the geographical location of the food retailers.

Our study suggests that the geospatial distribution of food retailers is not homogeneous in the area studied. However, the lack of food retailers in some regions should not be enough to affirm that there are food deserts in the study area, as there appears to be virtual and physical food entry points near all IRIS studied. Food desert is probably not an appropriate term to describe the food retail provision in the city and should the notion of unsupportive food environments proposed by Shaw (2006) be more coherent with the reality found in Rennes. Food purchases practices of people living in areas with limited food provision can be more effected by the geographical constraints. This might be worse in situations where other constraints exist, like lack of time, lack of financial means to the desired food or conditions of disability and infirmity.

Based on what was reported by the consumers, part of the food retailers, among which the large-scale distributors, seem to be adapting to trends and consumers' preferences and new demands. Increasing options of gluten-free products and the choice of bulk purchasing are examples of how to evolve to meet the needs of consumers. An increased availability of organic products seems to also a characteristic of the food retail environment.

For the consumers, the food environment is apprehended altogether, that is, through several aspects like food quality and taste, food prices, food labeling and promotion and the physical access to food, which makes it difficult to isolate the effect of the spatial factor. Our study rendered results with regards to the comparison of the objective commercial food environment and the perceptions that people have of it. Results showed that people perceive it as adequate or inadequate in relation to an ideal situation of food provision. This ideal situation is determined by a set of factors like the financial means, the routines of daily life, the conditions for mobility, the

personal preferences and the ethical consumption, among others, that explain the system of constraints particular to each consumer. Socio-demographic variables (education level, family composition, employment status, occupational category, etc.) explain part of the constraints. Each consumer has a repertoire of food purchasing practices and strategies that he can deploy, which will be explained by the totality of constraints that affect his daily life. The ideal types created detailed the response of consumers to the constraints imposed by the spatial location of food retailers, that can be an adaptation, a privation or the extension of their territory of life by means of an effort.

Many challenges seem to exist to improve access to food, particularly to fresh products and to the so-called sustainable products. The perception of prices appears to influence the purchasing practices of organic products, for instance. Issues linked to mobility play also an important role in determining practices. Suggestions for future research include a more comprehensive assessment of the food that is available in the food retail environment in the neighborhoods of Rennes, as well as an evaluation of the evolution compared to previous years.

While this research remains an empirical study in the city of Rennes which presents different limitations, it has a practical relevance as it was able to contribute with a few policy considerations and inputs. We believe to have provided inputs that can subsidize this discussion and move forward in a better understanding of how consumers relate to the food environment and which factors are key in determining their practices. Food policies should be thought in a comprehensive way and in consonance with policies from other fields, like mobility policies. Policy-makers should likewise take into consideration the root causes of the unequal access to food, like social disparities.

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## Annexes

### *Annex 1*

#### *Interview Guide – English translation*

##### Interview Guide

Introduce yourself: Hello, I am doing my master thesis research on the food shopping practices of people living in Rennes. The purpose of this survey is to better understand the practices and strategies of purchase for home-cooking: preferred food retailers and options, mode of transportation used, etc. This interview is anonymous, and your answers will be used exclusively for research.

If the person asks for more details: I can give you more details in the end, if you're interested.

Ask the OKAY for the recording: if you agree, I want to record this interview with a voice recorder. This will allow me to be more available and more attentive. Voice recording is only for my own use for this study.

##### *Purchasing practices*

- How do you organize the food purchasing in your household? (where, routines, schedule, frequency, with whom, how do you carry food ...?)
- Please explain better how it takes place (from planning to what you get home with food)?
- Why do you choose the options mentioned?
- What separates the current situation from the ideal situation?
- To be closer to this ideal, what do you do?

##### *Food practices*

- What do you normally purchase in each place? (product category)
- Are there products that you do not find? In this case, what do you do?
- Please tell me more about the food in your household: preferences, diet, habits, etc?
- Local products: do you purchase? why?
- Organic products: do you purchase? why?

##### *Spatialization of the food practices in the territory of life / mobility*

- Let's talk about the spatial distribution of the food retailers. What are the options available near your home? (ex: grocery stores, supermarkets, markets, etc.)
- And near your workplace and transit routes ? (activity spaces – territory of life). Are they easily accessible?
- Mobilities: Tell me about the traffic lanes / transportation networks that connect you to these places.

#### *Interview Guide – Original French version*

##### Guide d'entretien

*Se présenter* : Bonjour, je fais une recherche sur les pratiques d'approvisionnement alimentaire des habitants de Rennes. Cette enquête vise à mieux comprendre des pratiques concernant la restauration au foyer : les modalités d'approvisionnement préférées, les moyens de déplacement utilisés, etc. Cet entretien est strictement anonyme et vos réponses serviront exclusivement à la recherche menée dans le cadre du stage.

*Si la personne demande plus de détail* : On pourra en parler à la fin, si cela vous intéresse. Je pourrai vous expliquer plus, mais je ne peux vous dire plus en ce moment pour pas biaiser vos réponses.

*Demander l'OKAY pour l'enregistrement* : si vous êtes d'accord, je souhaite enregistrer cet entretien avec un dictaphone. Cela me permettra d'être plus disponible et plus à l'écoute. L'enregistrement est seulement pour ma propre utilisation pour cette étude, il ne sera pas publié ou diffusé. Encore, c'est anonyme.

#### *Les pratiques d'achat*

- Racontez-moi comment vous organisez-vous d'habitude pour vous approvisionner. Où est-ce que vous allez ? Comment vous y allez, routines, temps, fréquence, avec qui, comment vous portez la nourriture ... ?
- Comment ça se passe (dès la planification jusqu'à ce que vous arrivez chez vous avec la nourriture)?
- Pourquoi allez-vous vous procurer de la nourriture dans les endroits cités ?
- Qu'est-ce qui sépare la situation actuelle de l'idéal pour vous ?
- Pour être plus proche de cet idéal, comment vous y prenez-vous ?

#### *Les pratiques alimentaires*

- Qu'est-ce que vous avez acheté à chaque endroit ? (principales catégories)
- Y a-t-il des produits que vous ne trouvez pas ? Si vous ne trouvez pas tout ce qui vous cherchez, quoi faites-vous ?
- Alimentation au foyer : préférences, régimes, habitudes, etc ?
- Produits bio : vous en consommez et pourquoi ?
- Produits locaux : vous en consommez et pourquoi ?

#### *La spatialisation des commerces dans le territoire de vie / les mobilités*

- Parlons un peu de l'espace. Parlez-moi, s'il vous plaît, des options disponibles pour l'approvisionnement alimentaire aux environs immédiats de votre résidence (ex : commerces et autres options existantes comme *supermarchés, marchés, commerce proximité, traditionnel, marchés, AMAPs, etc*)
- Et près de votre travail/activité principale et voies de déplacement ? (territoire de vie). Sont-ils facilement accessibles ?
- Mobilités : Parlez-moi des voies de circulation / réseaux de transport qui vous relient à ces lieux.