CONSUMER PREFERENCES FOR RETAIL CHANNEL AND BEEF STEAK ATTRIBUTES: EXPERIMENTAL EVIDENCE FROM ARGENTINEAN CONSUMERS

By

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ABSTRACT

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Traditionally-produced beef from Argentina is demanded internationally. Its price, therefore, is high. Labeling adds a cost, which makes certified products harder to afford, especially for locals. Are Argentinean consumers willing to pay for sustainably-produced beef? Are these consumers using alternative sources of information, other than product labels?

A purchase decision is comprised of two choices: what to buy and where to buy. Food economics research has mostly focused on the "what to buy" question. Demand for different products' attributes and production practices has been extensively documented. Studies on consumer preferences for food retailer attributes, however, are sparse.

We study Argentinean consumers' preferences for retailer characteristics by deriving welfare measures regarding trust, firm size and variety of product offering. In addition, we assess Argentinean consumers' preferences for beef steak credence attributes such as origin, type of farm, and organic production certification.

Moreover, we hypothesize that consumers make trade offs between their preferences for retailer and product attributes. For example: is food origin labeling necessary when it is sold by a small retailer? To investigate this question, we explore the relationship between the WTP results of the two decision making processes, as well as their determinants.

To my Grandparents

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1. INTRODUCTION

This chapter summarizes the motivation for this study, the main questions, and how they are answered throughout this document.

1.1 Motivation

Argentina, officially the Argentine Republic, is a federal republic located in the southeastern part of the American continent (Figure 1). It has a mainland area of one million square miles,

Figure 1: Location of Argentina and its capital city relative to Latin America

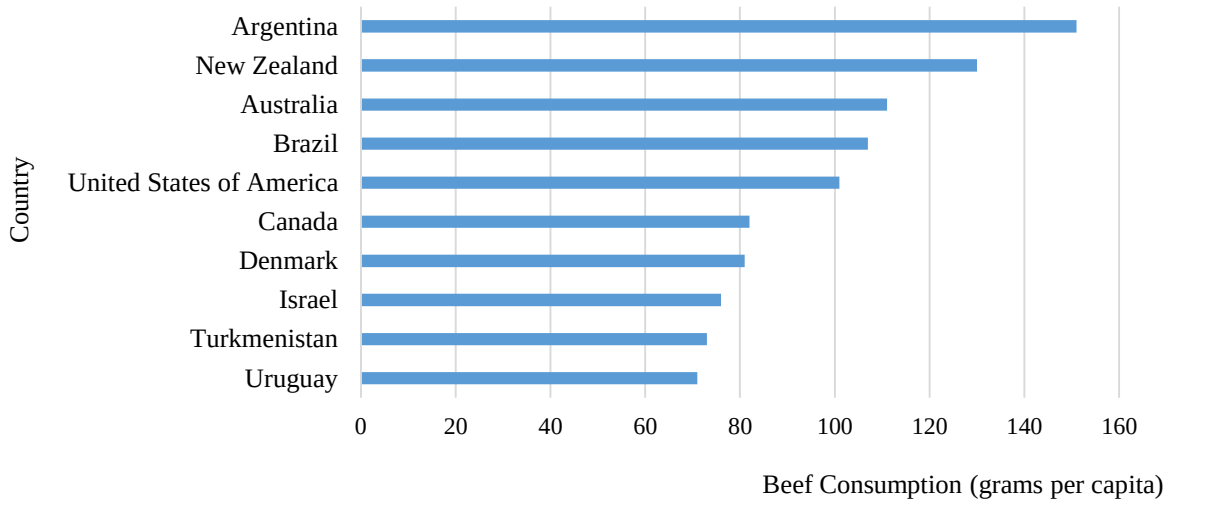
which makes it the eighth-largest country in the world, the second-largest in Latin America, and the largest Spanish-speaking country. Argentina has the second largest economy in South America, the third-largest in Latin America and is a member of the G-15 and G-20 major economies. It is also a founding member of the United Nations, World Bank, World Trade Organization, Mercosur, Union of South American Nations, Community of Latin American and

Caribbean States and the Organization of Ibero-American States. It has the highest Human Development Index rating in Latin America.

The city of Buenos Aires is the capital and largest city of Argentina, and the second-largest metropolitan area in South America. Approximately 40% of the country's population lives in the capital and its surroundings. Average life expectancy in the city is 77 years, with a literacy rate of 99.6%, both being the highest of the country.

Beef is the second largest food value chain in Argentina in terms of gross value added, both in the agri-food and agro-industrial stages, following soybeans. Argentinean consumers eat more bovine meat than those in any other nation; roughly 1.5 times American beef consumption (Figure 2). Globally, the average consumption of meat among all foodstuffs is 9%, and beef is

Figure 2: Daily per capita beef consumption in 2011



Source: elaborated with data from FAO, 2012

of all meat products (11%), at approximately 26 grams per person per day. Argentina, on the contrary, reports high meat consumption (15% of the total food), with beef being the most

heavily consumed (47%). The average per capita consumption of beef in Argentina totals 150 grams per day, meaning that beef consumption in Argentina is approximately six times more than the world average (FAO, 2012).

The city of Buenos Aires has approximately 2,500 meat points of sale, which equates to one retail outlet per every 400 households or every 1,172 inhabitants. Approximately 20% of these points of sale are supermarkets. The rest are either butcher shops or mini-markets in which a butcher is associated with some other seller (vegetables, general, or both). Argentinian shoppers prefer meat to be cut and packaged at the moment of purchase (Aulicino et al., 2007). This service is provided by all butchers and by 77% of the supermarkets. Butcher shops still comprise 60% of all beef sales. Beef found in supermarkets usually comes from feed-lot type of operations. Instead, beef purchased from butchers frequently comes from farms that use more natural practices and is therefore typically leaner (Bisang, 2003).

Butchery is one of Argentina's most culturally significant professions. In order to find quality products and to exercise responsible consumption, Argentine consumers shop many times a week, thus incurring large transaction costs. It is unclear if consumers prefer traditional retailing channels because they seek high quality service, product quality, or both.

1.2 Research Questions

It is crucial for farmers and retailers to offer products and outlets that satisfy consumers' needs. For this to be possible, they need to understand how consumers are making decisions. When consumers in Argentina purchase meat, they go through two decision making processes: where to buy the product and what product to buy. In this study we disentangle whether

Argentinean consumers frequent butchers because they prefer the service they offer, or if what they are really interested in is the attributes of the beef typically offered in this retail channel. To do so, we assess the relative value for certain retailer and beef steak attributes. For instance in regards to retail channels, is the availability of an employee to answer questions and cut meat per-request important? What about the variety of meat products offered, does this affect store patronage? Do consumers prefer smaller retailers? Regarding beef products, do they care about the type and location of the farm that raises cattle, and the practices they use? What is the relative importance of each of the retailer and product attributes? Additionally, we explore trade-offs and relationships between these two decisions. For example: Does demand for product attributes vary with retail channel preferences? Do customers that value farm size also value retailer size? Do individuals that value organic beef also value high customer service? Are the customers who are willing to do more for finding a retailer that satisfies their needs also willing to pay more for selected beef attributes? Are consumers who value convenience more than reliability from their retailer more willing to pay a premium for proper labeling on their product? Answers to these questions will allow producers and retailers to design better strategies independently, as well as improve business relationships between them. They will also be useful for industry planners and policy makers. Ultimately, these strategies and policies will allow consumers enhanced access to the products they want and the retailers they prefer.

1.3 Goal

The goal of this study is to better understand consumer behavior regarding beef purchases in Argentina. Supporting objectives include (1) understanding preference for retailer attributes

and drivers of store patronage; (2) quantifying consumer demand for beef credence quality attributes; and (3) uncovering relationships between store choice and product choice.

The information generated by this study will allow for retailers to better strategize their retail mix based on market segmentation, industry planning by policy makers, and optimization of production practices by farmers. The actions taken by these actors based on reliable information should improve general supply chain efficiency and sustainability. According to the UN Global Compact, the objective of supply chain sustainability is to create, protect and grow long-term environmental, social and economic value for all stakeholders involved in bringing products and services to market. These policies would result not only in consumers getting easier access to better retailers and beef products they prefer, but also in benefits to the society in general.

1.4 Outline of the Thesis

To answer these questions, we estimate customers' willingness to spend time (WTT) to access certain store characteristics and willingness to pay (WTP) for selected credence beef attributes. We also test the hypothesis that the WTP for these attributes is different across consumers' sociodemographic/behavioral/attitudinal variables such as age, education, income, beef consumption and use of the retailer as a quality cue. Likewise, we find differences in the WTP of consumers that report certain traits from their retailer such as trust or advice-giving. Finally, we explore relationships between WTT and WTP.

The remainder of this thesis is organized as follows: The next chapter provides background on the Argentinian beef value chain and the existing literature on consumer preferences and

choice. Chapter 3 includes a description of the empirical methodology used in this study. Chapter 4 describes the data, Chapter 5 presents the results, and the final chapter discusses the implications of the study. Supplemental information is made available in the appendices.

2. THE BEEF VALUE CHAIN IN ARGENTINA

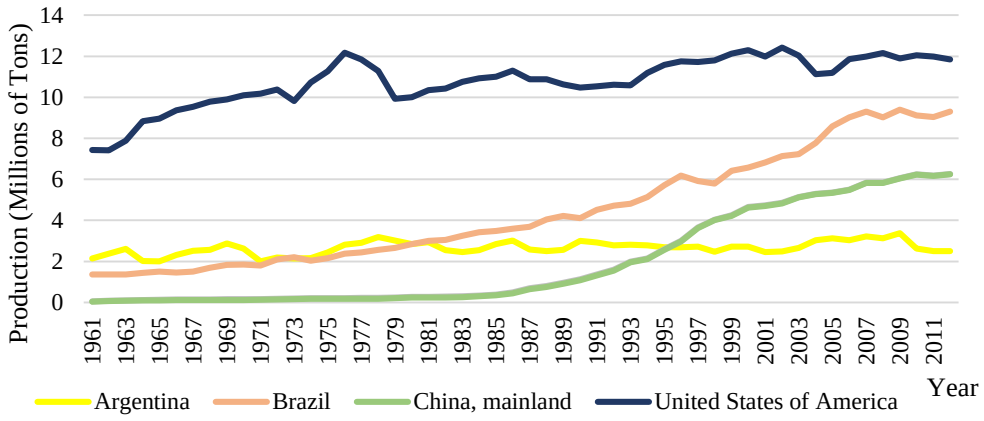
This chapter describes the Argentinean beef value chain. We focus this study on a local value chain because of many reasons. First, the local beef industry has a much larger market share as compared with the export market. Second, its diversity - as it is shown in this section - reveals high value not only from an economic but also from a sustainable development standpoint. This is especially important in a developing country. According to Norberg-Hodge et al. (2000), the application of sustainable practices in the value chain can strengthen local economies and markets given disruptions due to globalization. Some of these sustainable practices include developing connections between consumers and famers, boosting ethical capital and social capital around food supply chains, and educating consumers about the source of their food and the impacts of different production methods. One final practice suggested by Norberg-Hodge is creating feedback mechanisms to provide information to end-consumers on their impact on natural and social systems. For more information on ethical capital, we refer the reader to Bull (2010).

2.1 Background

Argentina is the 4th largest beef producer in the world, after the US, China, and Brazil. Even though its consumption rates are high, the quantity of beef produced in Argentina hasn't increased much in the last 50 years (Figure 3).

The high demand for meat in Argentina puts stress on the domestic sector of the value chain. Almost 80% of the beef produced is sold locally, while meat exports are only 3% of total

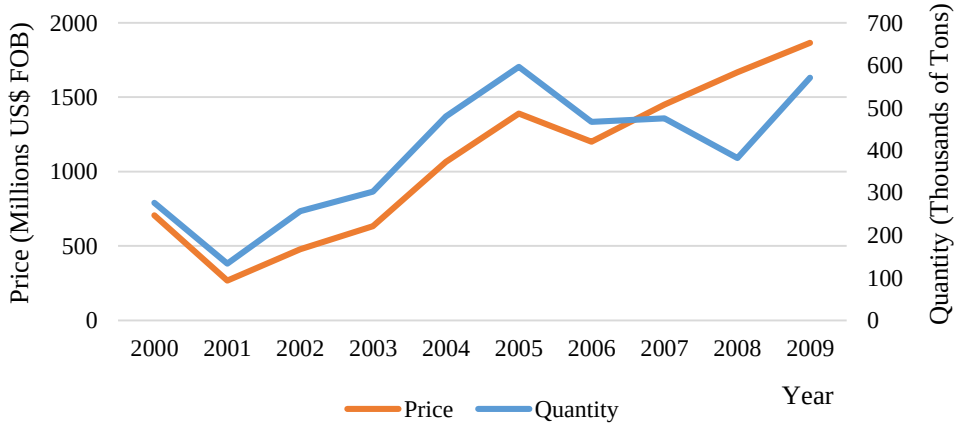
Figure 3: Production of beef in selected countries



Source: elaborated with data from FAO, 2012

food exports (oil, oilseeds and cereals make up 25%). Exports of Argentinean beef do not necessarily increase with increased prices (Figure 4) (beef elasticity of demand is discussed in section 2.2). The main importers of Argentinean beef are Russia, Germany, Chile and Israel. In 2010 and 2011 Argentina was the world's 11th largest beef exporter, despite being the 4th largest producer (FAO, 2012). The only country from which Argentina has imported meat steadily for a number of years is Uruguay. Average imports for the period 2003-2011 from this country were 51 tons (FAO, 2012).

Figure 4: Quantities and prices of Argentinian beef for export

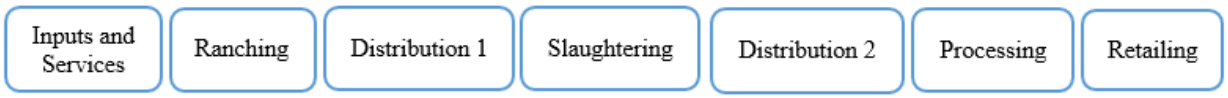


Source: computed with data from FAO, 2012

The classical breakdown of economic sectors introduced by Clark (1957) includes the Primary, Secondary and Tertiary Sectors. The Primary Sector involves the retrieval and production of raw materials. The Secondary Sector involves the transformation of raw or intermediate materials into goods. And the Tertiary Sector involves the supplying of services to consumers and businesses. In its production, industrialization and service sectors, the Argentinean beef value chain (VC) employs 550 thousand individuals. The primary sector accounts for 47% of employment, while the secondary and the tertiary sectors add 22% and 31% to the total (Iglesias & Ghezan, 2010).

The main segments in the input-output structure of the meat VC, which brings beef from initial conception to the consumer's hands include input providers, production (ranchers), slaughtering, distribution and marketing, and sales (Figure 5). Each segment will be explained in the following sections.

Figure 5: Segments of the Argentinean beef value chain



2.2 Input and Service Providers

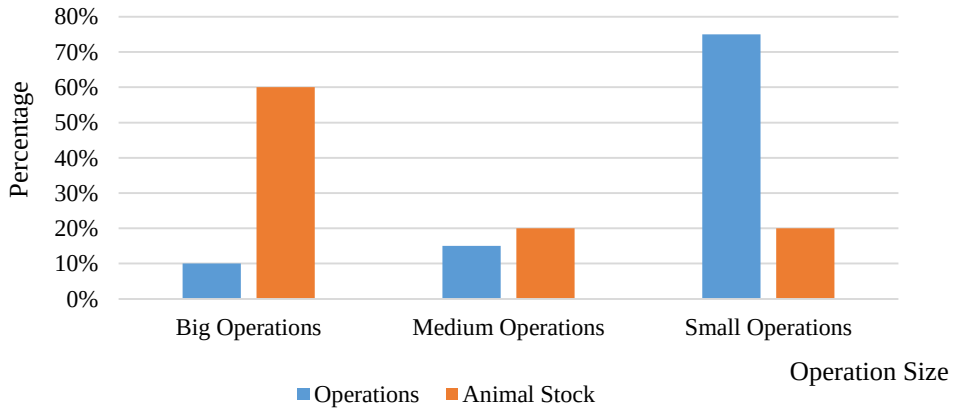
The most significant services in this activity are those provided by agricultural engineers and veterinary doctors. With respect to inputs, relevant ones are genetics (semen), bulls, cows, heifers and calves. These inputs are sold by certain ranches, which are are called breeders. Seventy-seven percent of the Argentinean ranches are breeders. Thirty percent of the breeders, integrate their breeding activities with ranching activities. They sell inputs to other farms, and

they also raise their own animals for slaughtering. These are scale firms that feed their animals in corrals with nutritionally concentrated formulas, usually referred to as a feed-lot. The other 70% of the breeding farms are usually located in low-quality soil areas and feed cattle with grass only, while it is spread across large areas of land. These farms only sell inputs. They cannot raise cattle as well because the quality of the grass is not high enough to reach the necessary weight gains (Iglesias & Ghezan, 2010).

2.3 Ranching and Distribution

Thirty-three percent of the Argentinean ranches perform only the final fattening of cattle. Sixty percent of the animal stock belongs to 10% of the ranching firms (with more than 500 animals). Of the other 40% of the stock, 20% is in the hands of 75% of the firms (small ranches, with less than 250 head of cattle), and 20% is in middle-sized farms, with 250 to 500 animals, that are 15% of the total ranches (Iglesias & Ghezan, 2010). This means that most of the cattle are raised on large operations while most of the ranches are small to medium operations (Figure 6).

Figure 6: Percentage distribution of cattle and ranches by size



Source: elaborated with data from Iglesias & Ghezan, 2010

There are 210,000 ranches in Argentina (Bisang, 2003). Ranches that raise cattle can be classified as operating in an either extensive or intensive production system (the latter usually called a feed-lot). Only 4% of the ranching farms are feed-lots, but they are growing rapidly. In 2008 there were 1,890 feed-lot farms and in 2011, 2,500 (32% increase in three years). Since fattening cattle in corrals requires higher investments in assets which are very specific to that activity, these tend to be the largest firms. The extensive type of ranch, on the other hand, tend to be small or medium-sized. This type of enterprise feeds animals out of pastures that bovines harvest themselves while they are spread across large areas of land ("grazing"). This is the traditional practice, which gives as a result a sustainable and healthier product. Sustainable products are defined as those that provide environmental, social and economic benefits. Grass-fed beef products have lower cholesterol levels and fat content (Bisang, 2003). Recalde and Barraud (2002) determined that the difference in fat between pasture and grain fed animals was between 10 and 25%.

Beef sold for the export market is all produced under traditional feeding practices. The majority (60%) of beef produced for the internal market comes from traditional farms and the rest (40%) from feed-lots. While the majority of the feed-lot sector is comprised of small farms (57%), these only supply 13% of the feed-lot cattle. By contrast, 2% of the feed-lot farms are big enough that they can provide 27% of the cattle finished in corrals (Iglesias & Ghezan, 2010). This implies that, in both the ranching business in general, and the feed-lot business in particular, cattle is concentrated in large farms and most of the ranchers are small to medium-sized businesses.

The province with the most feed-lots in the country is Buenos Aires (BA). Forty-four percent of the cattle raised in feed-lots are in Buenos Aires. The province of Buenos Aires

contains the city of Buenos Aires and belongs to the Pampa Region. The Pampa Region, or Pampas, accounts for almost 90% of the beef processing quantity of Argentina, with the province of Buenos Aires being the highest contributor (70%). Sixty-six percent of the country's human population is in the province of Buenos Aires, so this concentration is a result of the density of consumers. The Pampas are fertile lowlands that include the province of Buenos Aires, a few other Argentine provinces, the neighboring country of Uruguay (located to the east, with 6% of Argentina's land size), and the southernmost Brazilian State. The climate in the Pampa Region is mild, with precipitation of 24 to 47 in, more or less evenly distributed throughout the year, which makes its soils appropriate for agriculture. Therefore, the quality of the meat from both Buenos Aires and Uruguay is high.

Outside of the Pampa Region, San Luis (SL) is the province that processes most beef (Figure 7). San Luis' beef production quantity is only 7% of BA's, and it contributes to only 4%

Figure 7: Location of the Pampa Region and the province of San Luis relative to South America

of the total cattle raised in feed-lots. Among the 23 Argentinean provinces, SL is the 7th in number of feed-lot ranches. Of the total country production SL produces 3.1% and BA 42%, and

of the quantity that is exported SL produces 1% and Buenos Aires 51%. Seventy-one percent of what is processed in SL comes from other provinces, while only 24% of beef processed in BA comes from other provinces (Iglesias & Ghezan, 2010). These lower production levels are due to the weather. San Luis has a semi-arid climate and it closely borders a humid subtropical climate. Summers are hot and humid, and winters are cool and dry, with temperatures falling below 32 °F sometimes and snowfalls occurring occasionally. The hottest month, January, has an average temperature of 75 °F, and the coldest month, July, has an average of 48 °F. Beef quality in these environmental conditions is subject to the production system used: feed-lots achieve fat contents equivalent to those in Buenos Aires, and extensive practices result in very lean beef.

San Luis is located 500 miles away from the city of Buenos Aires. An average Buenos Aires' (BA) farm is located 250 miles away from the city of Buenos Aires, half the distance. A farm in Uruguay is approximately at the same distance as one in BA, and in the same region, but in a separate country.

2.4 Slaughtering and Distribution

This section discusses the slaughtering stage and the distribution stages that bring cattle to them and take it from them. The "Distribution 1" stage is the one in which cattle are taken from ranches to slaughterhouses, and the "Distribution 2" stage is the one in which cattle are distributed from slaughterhouses to processors. These stages within the VC are represented on Figure 5 above. The "Distribution 1" stage can be divided into direct and indirect sales. Sixty-six percent of the cattle is sold directly to slaughterhouses. This is the distribution channel used by big producers (feed-lots), and supermarkets and slaughterhouses that require inputs that are

reliable, constant, in high volume and of a specific quality. These firms negotiate commissions and expenses directly (Bisang, 2003). On the other hand, 34% of the cattle go to intermediaries: cattle brokers (4%), annual fairs (12%) or auction markets (18%). Auction markets do not trade cattle that comes from feed-lot operations. Therefore, most of what is sold indirectly is likely to come from a small or medium farm, and almost all that is sold directly has a high chance of coming from a feed-lot. Small farms use local fairs or commission agents to sell their product, due to the fact that they don't reach high levels of production, and therefore incur higher transaction costs. The transportation from ranches to slaughterhouses is always done with live animals. The distribution after the animal is slaughtered is performed through a cold chain, and sales can, once again, take place either directly or through a broker.

The slaughtering facilities in the Argentine territory are quite well-distributed, many being small rural plants or administered by the local government. However, 70% of the slaughtering is performed by only 77 of these facilities, comprising 15% of the total national production (Bisang, 2003). The Pampa Region contains 52% of the country's processing plants, but their output is 90% of the total quantity. This means that the slaughtering revenues are concentrated in this area. Foreign-owned slaughterhouses - such as Tyson Foods and Cargill - make up 40% of beef exports, even though they are responsible for 14% of the total slaughtering. Groups or big national companies make 18% of the exports when they perform 38% of the slaughtering, and small national companies make 42% of the exports when they slaughter 62% of the cattle. This means that big slaughterhouses are focused on the export market and medium slaughterhouses are focused on the internal market, while small slaughterhouses take a bit of both.

2.5 Processing

Beef processing in Argentina is usually integrated into the retail stage. If the retailer is a butcher, they will typically buy a half carcass. Butchers cut and package meat at the point of purchase. Grunert et al. (2004) affirm that consumers prefer to entrust the purchase decision to an expert, who would be more capable of predicting the outcome of the meal than themselves. That's why even though supermarkets sell mostly packaged meat, 77% of their stores also offer cut-per-request meat (integrated butcher). Supermarkets may have the facilities necessary to do the processing or not. If the latter is the case, then the processing takes place at meat processing plants, adding one additional stage to the value chain. Otherwise, the processing is done at one of the supermarket buildings. For the export market, all stages from slaughtering to processing are integrated in a specific type of plant.

2.6 Retailing

In Buenos Aires, until 1950, food retail channels were highly specialized and disaggregated. There were butcher shops, bakeries, vegetable shops and general stores. Aulicino et al. (2007) showed that 76% of the butchers in their sample had been in that business for more than 10 years, and that 26% had been selling meat for more than 30 years, highlighting the traditional trait of the job. They also point out that traditional butchers feel love and pride for their work, citing phrases from their surveys such as "Here customers become friends" or "I listen to you, make you happy, so you always come back."

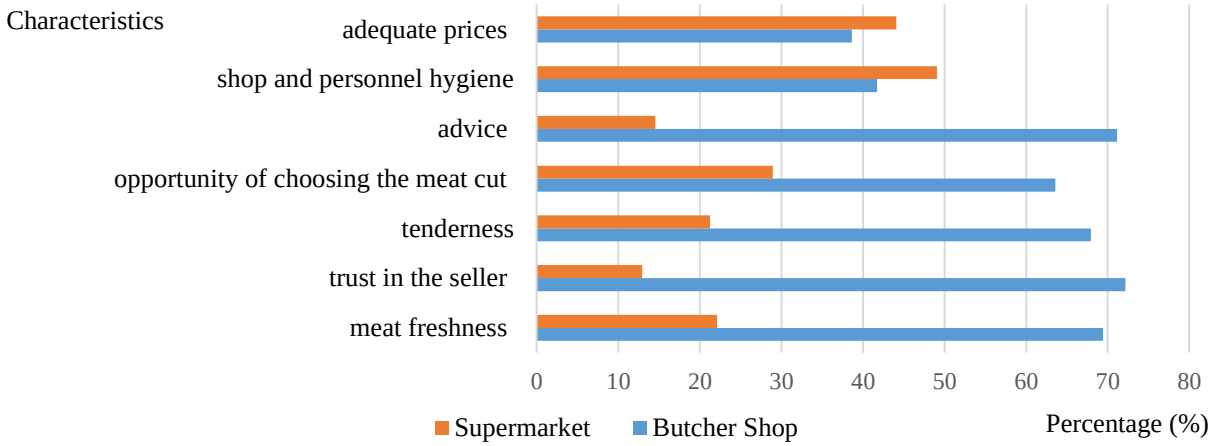
From the 1950s on, some of these specialized stores started incorporating other specialties and switching into a self-service instead of personalized-attention type of store. The

Rockefeller group – a global private company based in New York City, primarily involved in real estate operations – saw the potential and in 1960 it set up a self-service store like the ones that existed at the time in the US. This was the origin of supermarkets in Buenos Aires. By 1969 there were 162 supermarkets, most of which were around the city of Buenos Aires (Ablin, 2012). In 2007, Aulicino et al. stated that female workers and the modification of the structure of family had been the main drivers of change in meat retailing. Nowadays three large supermarket companies dominate, also operating in the cattle market. These three companies own six different supermarket chains and control 75% of the supermarket market share (Santellán, 2011). Carrefour, a French company, operates Carrefour and Día stores. Cencosud (Chile) operates Vea, Jumbo and Disco. Coto is the third, and it is a special case as it owns both supermarkets and meat processing plants. Coto is an Argentinean company that started as a butcher chain that aimed to shorten the link between producers and consumers. They focused on direct sales and tried to optimize the traditional hand-made butchers' work by innovating in the cutting process. The difference between Coto and a regular butcher is that Coto managed to buy live cattle and outsource the slaughtering, instead of buying the half carcass from slaughterhouses.

The relationship between butcher shops and supermarkets is tense. A study conducted by the Center of Studies for the Metropolitan Economic Development in 2004 showed that the opening of a supermarket decreased the number of butchers in a neighborhood in the City of Buenos Aires from 21 to 15 (29% less) over 10 years. Nevertheless, butchers still handle most of the beef market sales, as was mentioned earlier. This is because there is a great deal of support from customers for this type of retail format. Aulicino et al. (2007) described consumers' perceptions on supermarkets, concluding that consumers identify meat offered in shelves as "a massive product that does not respond to their personal taste." Even when supermarkets offer an

integrated butcher, they don't perceive him as a real butcher but as "just a supermarket employee." In this study, consumers were also asked to relate certain attributes to the different channels. The results are shown on Figure 8. These results suggest that in consumers' minds,

Figure 8: Percentage of buyers relating certain characteristics to the different distribution channels



Source: elaborated with data from Aulicino et al., 2007

supermarkets' main strengths are related to price and hygiene, but butchers offer better beef and customer service.

In the context of strong competition between traditional stores and supermarkets, the last economic crisis (in the 2000s) resulted in the emergence of a new retail format: mini markets. This type of store is the result of an association between a general seller, a vegetable seller and/or a butcher. This partnership decreases small retailers' fixed costs, such as rent and utilities. Mini markets are well located family businesses that offer convenient schedules, adequate variety and competitive prices. They may be owned by Argentine families, but they are usually owned by immigrants, often Chinese. Eighty percent of small self-service businesses are Chinese-family owned (Santellán, 2011). Shops are typically medium-sized with narrow aisles and limited

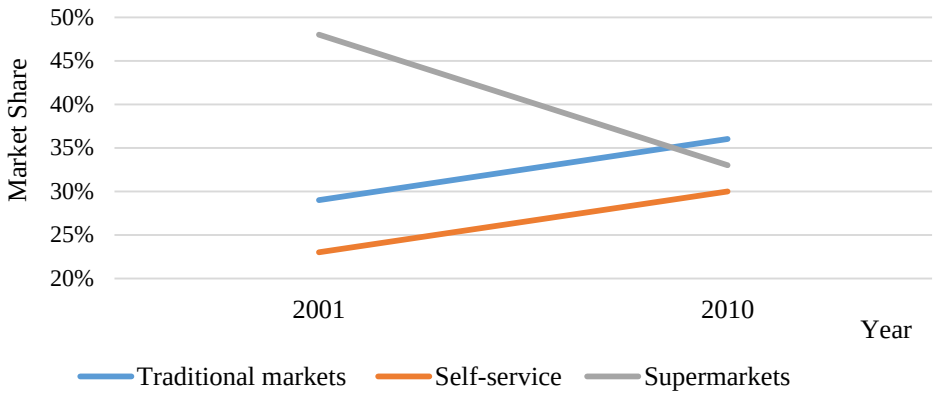
decoration or advertisement, and families sometimes live in the same building. They hire only a few employees -usually immigrants-, and therefore the customer service and hygiene levels are low (Baños, 2011). General products are displayed in shelves and sold in a self-service scheme, while vegetables and meat sales are outsourced to a specialist that provides a one-on-one type of service. Beef specialists are usually Argentinian, and vegetable specialists are usually Bolivian or Peruvian. Chinese store owners usually make their general product purchases in the form of cooperatives, and therefore they leverage good prices from their suppliers.

The process of mini market emergence – mini market being a store resulting in the partnership between butchers and other small retailers – can be seen as either a successful adaptation by small businessmen, or as a threat to the existence and viability of one of Argentina's most culturally significant professions.

Ablin (2012) showed, using data from the Argentinean Chamber of Bulk Distribution and Self-Service Stores (CADAM), that smaller stores have important market shares in food sales. They show that non self-service, one-on-one type of stores (among which there are butcher shops) have grown from 29% in 2001 to 36% in 2010 across the country and that small self-service stores (usually with an associated butcher) increased from 23% to 30%. On the other hand, their results show that supermarkets went from 48% to 33% of the total market share (Figure 9).

Because the mini markets took a significant portion of the market share, supermarkets introduced the concept of mini supermarket stores. These stores are strategically located, very small and with no fresh vegetables but with higher hygiene standards, competitive prices and more payment options than those offered by mini markets. Between 2009 and 2014 one of the

Figure 9: Market share by type of store in Argentina



Data source: elaborated with data from Ablin, 2012

supermarket chains - Carrefour - opened more than 350 mini supermarket locations across the city.

The retailing panorama, hence, encompasses supermarkets, butcher shops, traditional mini markets, Chinese markets, mini supermarkets and hard discount stores (also owned by supermarket corporations). All of these types of stores compete for market share in the beef sector.

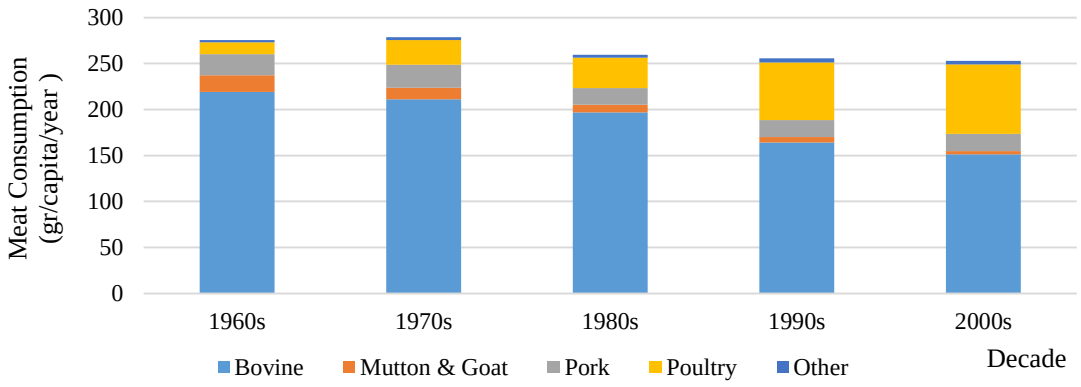
3. MEAT DEMAND IN ARGENTINA

In this section we quantify the demand for beef in Argentina as a comparison to other beef products. We explore expenditure shares and elasticities for beef, poultry and pork. In addition, we assess the sensitivity of the meat industry to structural shocks.

3.1 Background

Over the last 50 years, the total meat consumption (by volume) in Argentina has grown 28% (FAO, 2011). However, given that there has been a population growth of 95% in the same period (United Nations), per capita consumption has declined by 8% (FAO, 2011). Also, there has been a share redistribution among different meat products. The three main meat products are beef, poultry and pork. While beef has been decreasing its share (30%), poultry has been increasing and is nowadays almost six times what it used to be in the 1960s. Pork has decreased by 18% and mutton and goat by 80%, virtually disappearing from the market (Figure 10).

Figure 10: Meat consumption in Argentina by product and decade

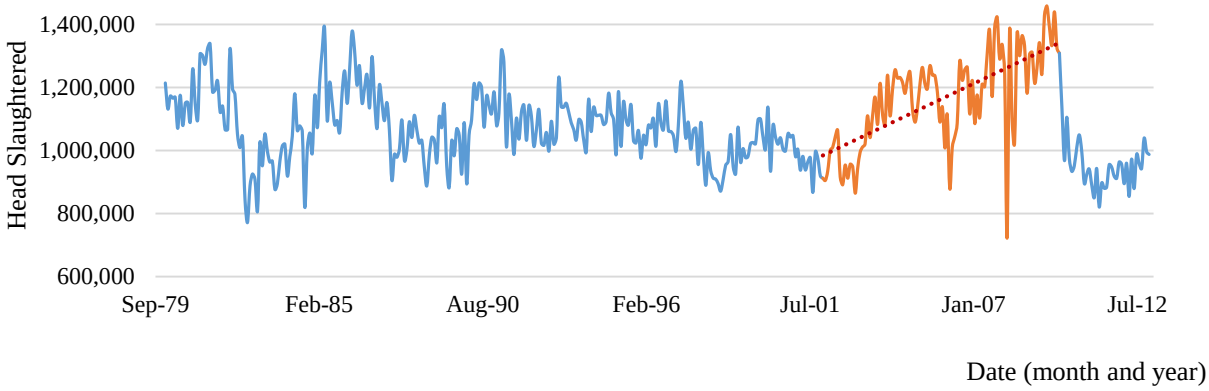


Source: elaborated with data from FAO, 2012

These are signs that there are changes in demand happening.

Between 2002 and 2009, there was an important increase in cattle sales (Figure 11).

Figure 11: Head of cattle slaughtered



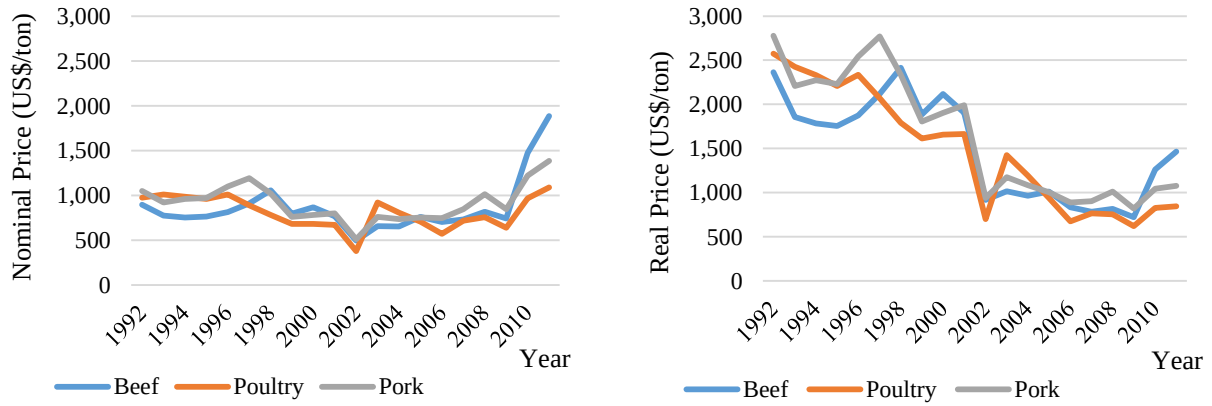
Source: elaborated with data from Sub-Secretaría Argentina de Agricultura

The increase of slaughtering, in this case, instead of being a sign of improved production, was a reflection of farmers getting rid of cattle. In this period bovine meat production decreased 30%. This was a consequence of the emergence of better cropping technologies that allowed farmers to switch from ranching towards cropping even on marginal lands, increases in agricultural products prices (mainly soybean to be exported to China) and increases in international demand for beef (Iriarte, 2008). But most importantly, it was a consequence of economic policy. In 1992, after yet another bout of hyperinflation, Argentina pegged its new currency, the peso, to the U.S. dollar at the rate of 1 to 1. This arrangement caused a massive bank credit expansion. Argentina's money supply increased between 5 and 60% until 1998. In 2008 the economy went into recession, with money supply decreasing by approximately 20% per year. In 2001, domestic depositors lost confidence in the banking system, and a bank credit deflation began causing the system to lose billions of dollars' worth of deposits. This triggered a confiscatory deflation policy, which consisted of constraining the availability of cash in the system, causing more recession, riots, deaths, and ultimately the resignation of the president in December of that year.

The confiscatory deflation policies continued until 2003. These policies dealt a severe blow to cash businesses and, according to the New York Times "brought retail trade to a standstill" (Reuters, 2001). As soon as deflation stopped, ranchers saw the opportunity and started selling their herds out. Also, improvements on salaries and income distribution and drops in unemployment rates increased domestic meat demand, reinforcing this trend in which herds were sold out.

Between March 2005 and April 2006 the government adopted a few economic policies to try to reverse this trend (1. Agree on and set fixed meat prices, 2. Minimum slaughtering weights, 3. Harder taxes for exporters and even forbidding exports temporarily). Unfortunately, these policies were not effective. Producers kept selling their cattle up to the point in 2010 when slaughter dropped suddenly just because cattle population had reached a minimum. Supply had decreased by 12 million head - equivalent to the total herd in the country of Uruguay (Iriarte, 2008). At this point, prices started climbing: not only nominal prices but even real prices, i.e., prices corrected by inflation. Furthermore, substitutes' prices habitually follow those of bovine meat, so the trend was repeated for all meat products (Figure 12).

Figure 12: Bovine, pork and poultry meat nominal and real prices in Argentina



Source: elaborated with data from FAO and Argentinean National Institute of Statistics and Census

3.2 Objective

The relevance of bovine meat in Argentinean diet and economy seems undeniable. But there are a few other questions that need to be addressed: are demands for meat products different? In December 2001 there was a social and political crisis. Did this affect demand for beef, poultry and pork products? What are the compensated and uncompensated demand cross and own-price elasticities? Are these products substitutes or complements? What are the expenditure elasticities of these products? Are they considered necessities or luxury goods? What are their expenditure shares?

3.3 Theory

Argentinean meat demand is analyzed using a form of the Almost Ideal Demand System (AIDS) proposed by Deaton and Muellbauer (1980), known as the Linear Approximate AIDS model (LA/AIDS) which has been widely used in empirical applications. The LA/AIDS model derives demand functions for each consumption item in budget share form. The general form of the derived share equations is:

$$w_i = \alpha_i + \sum_{j=1}^{n} \gamma_{ij} \ln p_j + \beta_i \ln\left(\frac{X}{P}\right) + u_{it} \tag{2.1}$$

where w_i is the expenditure share of the ith commodity, p_j's are prices, X is total expenditure on all commodities in the system and $\ln p$ is a price index. We utilize Stone's price index making the system of equations linear in parameters. The Stone price index can be expressed as:

$$\ln P^* = \sum_{j=1}^{n} w_j \ln p_j \tag{2.2}$$

In time-series applications, the LA/AIDS model is usually estimated in the first difference form when unit root or high autocorrelation is present in the dependent variable. The model thus takes the form,

$$\Delta w_i = \sum_{j=1}^{n} \gamma_{ij} \Delta \ln p_j + \beta_i \left[\Delta \ln X - \sum_{j=1}^{n} w_j \Delta \ln p_j \right] + \varepsilon_i \tag{2.3}$$

The basic restrictions of demand (adding up, homogeneity and symmetry) can be expressed in terms of the model's coefficients as follows:

Adding up:

$$\sum\nolimits_i \alpha_i = 1 \quad ; \quad \sum\nolimits_i \gamma_{ij} = 0 \quad ; \quad \sum\nolimits_i \beta_i = 0 \tag{2.4}$$

Homogeneity:

$$\sum\nolimits_j \gamma_{ij} = 0 \tag{2.5}$$

Symmetry:

$$\gamma_{ij} = \gamma_{ji} \tag{2.6}$$

We estimated the system of expenditure share equations using Zellner's iterative unrelated regression (ITSUR) procedure. To do so, we assumed no endogeneity in prices and total expenditure.

3.4 Data

This study was performed using a twenty year panel data set drawn from FAO, the World Bank, and The Argentinean National Institute of Statistics and Census (INDEC). The twenty years corresponded to the 10 years following the 2001 crisis and 10 years prior. Consumption quantities (in kg/year/capita) and prices (in US$/tonne) were drawn from FAO. Adjusted net national income per capita (in current US$) was taken from the World Bank. And the consumer price index (CPI), needed to convert nominal prices into real ones, was pulled from INDEC. Price and consumption data can be found in Appendix A.

3.5 Results

The demand model consists of three equations: beef, pork, and chicken. Nominal prices of the three meats were converted to real ones by using the CPI for food. Prices were normalized by their sample mean before the logarithmic transformation. In order to avoid the presence of unit root in the expenditure shares we used the first differenced form of the LA/AIDS model. To make the model conform to economic theory, the adding up (4), homogeneity (5) and symmetry (6) conditions were imposed. To avoid singularity in the error covariance matrix, the 'pork' equation was not included in the system during the estimation process. The parameters of the omitted equation were calculated using the adding up restriction. Furthermore, the model was estimated with a constant that serves as a time-trend variable in the reintegrated model for the levels of expenditure shares.

The first differenced LA/AIDS model, represented in equation (3) was estimated using the iterated seemingly unrelated regression tool in Stata. The code used can be found in

Appendix B. The model has two equations (beef and poultry) and was estimated with 40 effective observations (two equations and 20 years of observations). The estimated parameters for the three equation system are reported in Table 1 along with some single equation statistics. At the average sample values of the expenditures shares, the estimated expenditure coefficients were all found to be significant.

Table 1: LA/AIDS model parameter estimates

	Beef	Chicken	Pork
Beef	0.226***	-0.169***	-0.057***
	(0.020)	(0.016)	(0.008)
Chicken		0.184***	-0.015**
		(0.013)	(0.006)
Pork			0.072***
			(0.009)
Expenditures	-0.347***	0.230***	0.117***
	(0.065)	(0.054)	(0.019)
Intercept	-0.009**	0.008**	0.001
	(0.004)	(0.003)	(0.001)
Average Budget Share	0.642	0.275	0.084
R-squared	0.896	0.909	0.794

*** Denotes significance at the .01 level, ** Denotes significance at the .05 level

In the AIDS model, the expenditure elasticities, uncompensated and compensated price elasticities are given by the following equations:

$$\eta_i = 1 + \frac{\beta_i}{\overline{w_i}} \tag{2.7}$$

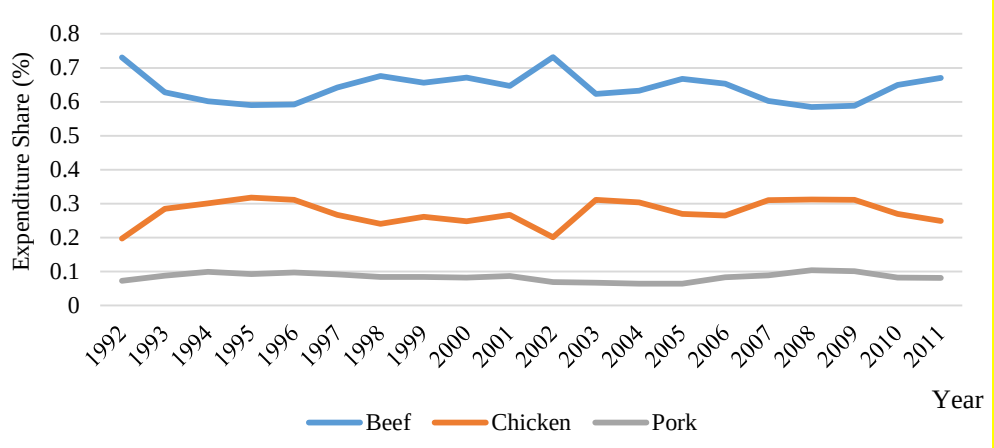
$$e_{ij}^{u} = -\delta_{ij} + \frac{\gamma_{ij}}{\overline{w}_i} - \frac{\beta_i \overline{w}_j}{\overline{w}_i} \tag{2.8}$$

$$e_{ij}^{c} = -\delta_{ij} + \frac{\gamma_{ij}}{\overline{w}_i} - \overline{w}_j \tag{2.9}$$

where $-\delta_{ij}$ is equal to one when $i = j$ and is equal to zero otherwise. $\bar{w}$ are the average expenditure shares in each meat equation and β_i and γ_{ij} are the estimated parameters.

In Figure 13 we can see the expenditure shares over time. Elasticities are said to be

Figure 13: Expenditure shares



inelastic if they are less than one and elastic if they are greater than one in absolute value. Calculated expenditure elasticities are shown in Table 2. The estimated expenditure elasticity for

Table 2: Expenditure elasticities and marginal expenditure shares

	Expenditure Elasticity	Expenditure Share (%)	Marginal Expenditure Share (%)
Beef	0.46	64.18	29.46
Chicken	1.84	27.46	50.46
Pork	2.40	8.37	20.07

beef is inelastic (0.46), indicating that beef is a necessity for Argentinean consumers within their meat budget allocation. The expenditure elasticity is elastic for chicken and pork (1.84 and 2.40). These results show that apart from beef, all other animal proteins are considered luxury goods within the meat budget allocation for Argentinean households. It is worth noting that assuming

that income and total expenditures are equal, i.e., if we assume savings are equal to zero, then the elasticities calculated are equal to income elasticities of demand.

In order to calculate the marginal expenditure shares, the estimated expenditure elasticities were multiplied by the expenditure shares. The results (right-hand side of Table 2) suggest that Argentinean meat consumption patterns have reached a threshold and that for any increase in future meat expenditures, the largest share of that increase would be allocated to poultry (50%), followed by beef (29%), and pork (20%). These results are consistent with the fact that beef consumption is already very high, and that poultry consumption has been increasing at a high rate while pork consumption has been steady through the past 50 years.

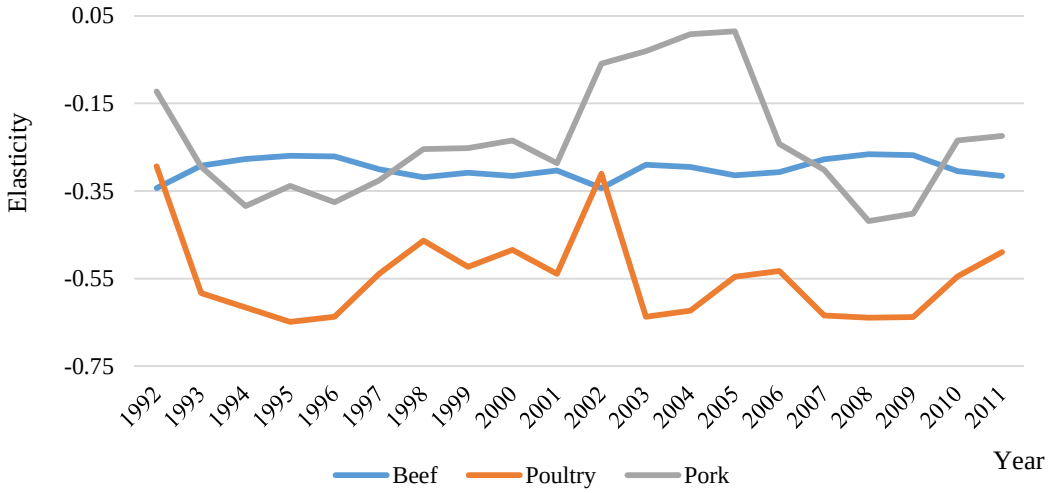
All own-price elasticities have the expected negative signs. The uncompensated own-price elasticity for beef is -0.30, poultry -0.56 and pork -0.26. These estimated results show that demand for these goods is inelastic. The compensated (Hicksian) own-price elasticities were found to be lower than the uncompensated figures (Marshallian).

Table 3: Demand elasticities

Quantity	Price	Uncompensated (Marshallian)	Compensated (Hicksian)
Beef	Beef	-0.30	-0.01
	Chicken	-0.12	-0.99
	Pork	-0.04	-1.01
Chicken	Beef	-1.15	-0.97
	Chicken	-0.56	-0.05
	Pork	-0.13	-0.97
Pork	Beef	-1.58	-1.04
	Chicken	-0.56	-0.91
	Pork	-0.26	-0.06

The observed uncompensated own-price elasticities are inelastic throughout the study period (Figure 14). The price elasticity of beef remains consistently close to -0.3, quite inelastic.

Figure 14: Uncompensated own-price elasticities



Poultry, on the other hand, fluctuated between -0.65 and -0.3, meaning that it's less inelastic and more variable. Pork fluctuated between -0.4 and 0, being the most inelastic of the three most of the time. This indicates that in general consumers are somewhat responsive to changes in poultry prices, less responsive to changes in beef prices and even less to changes in pork prices.

Few studies have reported uncompensated cross-price elasticities because of unexpected signs (Cai et al., 1998). Similarly, the estimated uncompensated cross-price elasticities had negative signs. What's more, the compensated or Hicksian cross-price elasticities were also negative indicating that in this subsystem all meats do not work as substitutes of each other but as complements.

On the following table (Table 4) we can see t-test results for statistical differences between the first period (1992-2001) and the second period (2002-2011). These results confirm the notion that the structural change that happened in 2001 affected meat demand patterns. Beef

Table 4: Results of t-test for differences between the 1st and 2nd period

Variable	Significance	Change type
Beef consumption	***	Decrease
Pork consumption		
Poultry consumption	***	Increase
Beef expenditure share		
Pork expenditure share	***	Decrease
Poultry expenditure share		
Beef expenditure elasticity		
Pork expenditure elasticity	***	Increase
Poultry expenditure elasticity		
Beef uncompensated own-price elasticity		
Pork uncompensated own-price elasticity	***	Increase
Poultry uncompensated own-price elasticity		
Beef compensated own-price elasticity		
Pork compensated own-price elasticity	***	Increase
Poultry compensated own-price elasticity		

*** Denotes significance at the .01 level

consumption decreased significantly (it went from 59 kg/capita/year to 55 kg/capita/year), while the quantity of poultry consumed increased (going from 24 kg/capita/year to 28 kg/capita/year). Many other variables remained unchanged between the two periods for these two products. The product that experienced changes in most of the variables analyzed, instead, was pork. The expenditure share for this product decreased (going from 9% to 8%), and the expenditure elasticity for it increased (going from 29 to 32). The highly elastic estimates obtained for the pork expenditure elasticity show that consumers are much more likely to spend additions to income on products other than this one, particularly after 2001. Both the compensated and

uncompensated own-price elasticities for pork increased on the second period. The uncompensated elasticity went from -0.29 to -0.19 and the compensated elasticity went from -0.08 to 0.01. This shows that consumers were also more responsive to price changes in pork on the second period. None of these variables showed any changes for poultry or beef between the first and the second period. This is and indicator that the demand system changed in 2001, but the demand for the two most demanded products remained constant.

3.6 Implications

One of the main conclusions from these results is the importance of beef in Argentinean diets and economy. This supports the idea that further studies on beef in Argentina would be of relevance. The fact that all of the chosen meats have positive expenditure elasticities means that as Argentinean incomes increase, the demand for them will continue to grow. Beef was found to be a necessity for Argentinean consumers while pork and poultry are considered luxury goods within the meat budget allocation. Moreover, consumers are not very responsive to changes in meat prices, especially beef and, to some extent, poultry. The different meats do not work as substitutes of each other but as complements. The results obtained on marginal expenditure shares indicate that new market niches might open for poultry producers and poultry feed businesses. Also, cattle producers and cattle feed businesses face a promising outlook due to beef's large market share, provided that strategies are built to cope with the competition of poultry products. Lastly, the sensitivity of this system to policy changes seems to be important. Having a better understanding of the demand for this bundle of products, as well as of the probability of being affected by circumstantial factors, and the possible factors involved, will support marketing decisions that otherwise would be made under uncertainty.

4. CONSUMER PREFERENCES IN THE LITERATURE

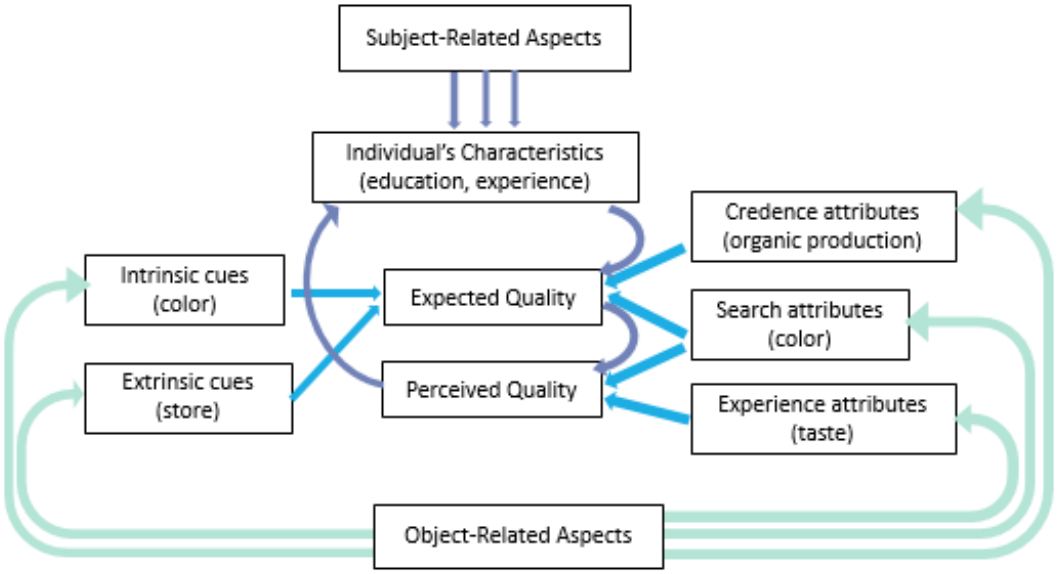
This chapter reviews the existing literature on consumer preferences and decision making. First, we describe the theory on product attributes and consumer decision-making process. Second, we describe the existing literature on consumer preferences for retail store features. Following, we describe the existing literature on consumer preferences for beef attributes. And finally, we review different elicitation methods of consumer preferences.

4.1 Consumer Decision Process and Product Marketing

A decision maker's choice depends, and is derived from both object-related (i.e. attributes and cues) and subject related aspects (e.g. individual's lifestyle, income level, etc.). Attributes are the characteristics of a product that make up its quality, and cues are signals used to infer the quality of a product. Object-related and subject-related aspects interact through quality perceptions in the consumption process (Figure 15).

The object and subject-related aspects of a choice are also, not surprisingly, the base of the marketing mix. The marketing mix is the set of actions, or tactics, that a company uses to promote its brand or product in the market. The 4 "Ps" that make up a typical marketing mix are price (a cue), product (bundle of attributes), promotion (cue) and place (cue). Nowadays, the marketing mix increasingly includes several other elemets such as packaging, positioning, people and even politics as a vital component (Dogra & Ghuman, 2008). These elements influence each other and make up the business plan for a company.

Figure 15: Aspects of a choice



Source: adapted from Caswell et al., 2002

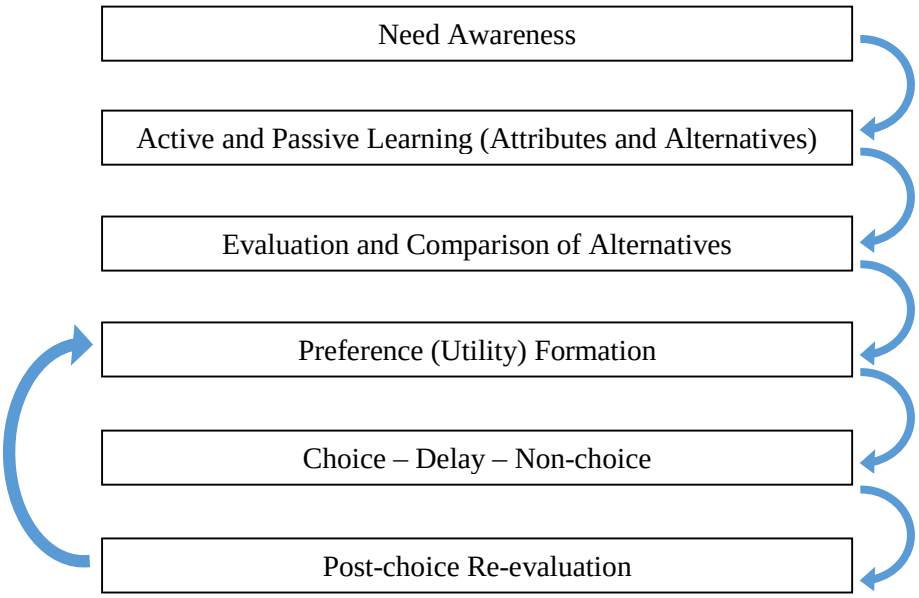
Attributes comprise the dimensions of an object's quality (Darby & Karni, 1973). They can be classified into search, experience and credence (Steenkamp, 1990; Becker, 2000; Grunert, 1997). Experience attributes are those ascertained on the basis of actual consumption of the product (e.g. taste, tenderness, leanness, etc.). Credence quality attributes are those that cannot be determined even after normal use of the product. With respect to credence quality attributes, Becker (2000) states that they are attributes that are of concern to the consumer but for which there are no accessible cues in the process of buying and consuming. Examples of credence attributes are hormones used, presence of bovine spongiform encephalopathy or mad cow disease, animal feeding guarantee, organically produced, respect for the animal's welfare, product origin, presence of genetically modified organisms, type of business, etc. Search or expected quality attributes are those that are observable to the consumer prior to purchase and are used to infer experience quality, for example fat marbling. Credence attributes pose problems in markets because the cost of defining, measuring, and verifying them is high, and there is an

incentive to cheat (i.e. produce counterfeit goods). Caswell and Mojduszka (1996) argue that a product's experience or credence attributes can be transformed into search attributes or cues via labeling. In their study about consumer perception of the quality of beef resulting from various fattening regimes, Bruns et al. (2005) state that there are often low degrees of correspondence between expected and experienced quality, and therefore brand names, generic marks and labeling schemes are all possible ways of providing consumers with additional information about meat products that can improve consumers' ability to evaluate the quality at the point of purchase. Brands and labels benefit not only the consumer by reducing information costs, but also the manufacturer, increasing their sales and/or prices, and therefore profits.

Quality cues are information used by consumers and suppliers in order to infer an object's quality attributes. Cues are defined by Steenkamp (1997) as informational stimuli that say something about the product. Cues can be intrinsic or extrinsic (Olson & Jacoby, 1972). Intrinsic cues relate to physical aspects of the product (e.g. color, shape, appearance, fat content, tenderness, marbling, etc.) and can be used interchangeably with the concept of search attributes. Extrinsic cues relate to the product but are not physically part of it (brand name, price, place of purchase, quality stamp, origin, packaging, production information, etc.).

There are several behavioral stages an individual goes through when making each purchasing decision (Figure 16). These stages comprise the relationship between expected and perceived quality, in interaction with consumer's characteristics. The first step is recognizing the need for a certain product. Then on stages 2 and 3 the consumer makes secondary evaluations such that his/her utility is maximized (for example the type of product, quantity, place where it can be purchased, possible substitutes, etc.). Once all these factors are considered, the final decision is made and the product is purchased if it meets the individual's preferences (stages 4

Figure 16: Overview of the consumer's choice process



Source: adapted from Louviere et al., 2000

and 5). Finally, during the consumption process (stage 6) new notions about the product quality are created and the decision re-evaluated. This serves as information that refine future decision making processes.

The aforementioned decision process occurs when an individual chooses a retailer and it is repeated again when s/he chooses a particular beef product. Hawkins et al. (1992) indicated that there are three basic sequences a consumer can follow when making a purchase decision: (1) brand (or item) first, outlet second; (2) outlet first, brand second; or (3) brand and outlet simultaneously. As such, the appropriate marketing strategies for both retailers and manufacturers differ depending on the decision sequence generally used by the target market. Furthermore, the literature suggests that these decisions aren't independent. Baltas and Papastathopoulou (2003) found that brand and store selections are correlated within groups of consumers (such as economy and quality seekers).

4.2 Consumer Preferences for Retailer Attributes

The literature on consumer preferences for retailer attributes has focused more on quantitative rather than qualitative research. Therefore no studies, to the best of our knowledge, have valued store attributes from a consumer welfare perspective in the agricultural and applied economics literature.

In their study on Polish consumers, Mącik et al. (2013) found that demographic factors other than age do not explain format usage patterns, and concluded that consumer attitudes are probably a more important factor. In a study performed in India, Jain et al. (2013) found that the most important factor for consumers is the availability and variety of products. Service is second. The third factor is ambience, the fourth are prices and the fifth factor is quality. Ghosh et al. (2010) found that customers appreciate shopping in a pleasant environment at one-stop location with a wider product-portfolio in a speedy manner. They group a dozen attributes in "Convenience and Merchandise Mix", "Store Atmospherics" and "Services". Rajaguru and Matanda (2005) explored the effect of product and store attributes on consumer loyalty. They found that all the characteristics selected have positive effects on customer loyalty, except product price. The attributes selected were service, quality and convenience of store and product quality, price and availability of new varieties. Koul and Mishra (2013) in their study on the Indian market found that customers rely more on store attributes when purchasing grocery and consumer durable goods than chemical or cosmetic products. The most important store attributes were found to be product assortment, product availability and retailer's attitude. They concluded from their analysis that when customers prefer certain store attributes they travel long distances to purchase, pointing out loyalty as an important factor in the food sector. Mafini amd Dhurup (2015) explored the drivers of customer loyalty in South Africa and found that sales assistance,

store atmospherics and store accessibility did not determine store satisfaction. On the other hand, store appeal and promotion played a significant role. They also found that store satisfaction was a good predictor for customer loyalty. Goel and Dewan (2011) studied consumer preferences in Punjab and found six factors that consumers prefer: variety & availability, services, ambiance, prices and promotion. Purushottam (2011) in her study in South Africa, found these as important factors to customers, in order: store environment and services, style and quality of apparels, price and sale management and merchandise management. She also built customer segments: Sensory Driven, Not Interested, Quality and Style driven, Value seeking and Difficult to Please, and they found relationships between these profiles and their store selections.

4.3 Consumer Preferences for Beef Attributes

The literature on consumer preferences for beef attributes in the world is abundant. It has focused almost exclusively on credence attributes, given that these play an increasingly important role in consumer preference formation (Zanoli et al., 2003; van den Heuvel et al., 2007).

Lusk et al. (2003) found that French consumers place a higher value on beef from cattle that have not been administered added growth hormones than German, British and American consumers. Their results also suggest that European consumers place a much higher value on beef from cattle that have not been fed genetically modified corn than U.S. consumers. Tonsor et al. (2005) determined that consumers in Paris and Frankfurt are concerned about genetically modified feed usage, and consumers in London and Frankfurt tend to be apprehensive about consumption of beef produced with the use of growth hormones. Loureiro and Umberger (2005;

2007) found that American consumers have higher preferences for food safety inspection and freshness. 'High-Quality Grade' and 'Reasonably Priced' were also rated as extremely desirable to very desirable. Other attributes, such as U.S. origin, good visual presentation, leanness, tenderness assurance, and nutritional value were also ranked as very desirable on average. Brands, meat produced or raised locally, and organic production methods were the attributes with the three lowest rankings. Umberger et al. (2003) concluded that Chicago and Denver beef consumers are mainly concerned about freshness, safety inspection, color, price and leanness. The attributes indicating production location or source of origin of the beef, such as country-of-origin, beef raised locally, and source assurance, were less important to these consumers. In Zaragoza, Spain, however, local-labelled lamb meat had a WTP premium over a non-labeled alternative (Gracia, 2013). Villalobos et al. (2010) assessed the importance of a set of beef quality attributes on the choice behavior of the Chilean consumer. They point out that price is the least important for the majority of consumers polled and that the quality assurance attribute is the most relevant attribute. Lagerkvist et al. (2006) studied Swedish consumers' preferences for animal welfare and biotech on pork. They concluded that consumers place a higher value on animal welfare and no biotech. Pouta et al. (20010) assessed the effects of country of origin and production methods on Finnish consumers' preferences for beef. The results revealed very strong positive perceptions of domestically produced broiler products, while the effect of production method was significant but minor. Zanoli et al. (2013) evaluated an organic label on beef in Italy. Their results showed that consumers attach higher value to organic meat.

To sum up, the attributes found to be significant in countries other than Argentina were use of growth hormones, biotech and GMO feed, food safety, freshness, quality grade, price, origin,

visual presentation, leanness, tenderness, traceability, nutritional value, brands, organic production and animal welfare.

The literature on Argentina is scarce, and it mixes beef attributes with store attributes, suggesting that our hypothesis that preferences for one might affect preferences for the other could be accepted. A study performed in Buenos Aires found that 72% of the customers surveyed said they didn't care at all about meat brand (Aulicino et al., 2007). On the contrary, they seem to value other characteristics more, such as meat freshness and tenderness, with 99% and 95% of the customers stating that they value those attributes a lot. The possibility of choosing the meat cut appears with 87% of the shoppers appreciating it a lot. Butcher customers were found to have substantial differences to the general consumer in two attributes: 91% value a lot the trust in the seller (instead of 76%), and 86% hygiene of the shop and employees (instead of 96%). This indicates that customers frequenting butchers are a lot more concerned with trust and a lot less concerned with hygiene than the regular store customers.

4.4 Consumer Preferences Elicitation Methods

We are interested in consumer preferences because they determine demand and demand is ultimately what shapes suppliers' behavior. Willingness to pay (WTP) is the maximum amount that a given consumer is willing to pay for (and thus values) a good or service or a specific trait of a good or service. The advantage of estimating consumer WTP is that it provides pricing information that is meaningful for industry leaders and policymakers. Assuming that a customer's preference for a product is a result of its characteristics, we can say that a customer's preference and therefore his willingness to pay for a product might change if certain attribute is

added or increased. For example, if a farmer wanted to switch to a healthier but more expensive raising method, would a customer be willing to pay for at least the cost of it? In order to answer this sort of questions we need to estimate the preferences of the consumer for product characteristics, which determine the choice (or non-choice) of a particular good.

From the research point of view, consumer's preferences for different attributes can be divided into revealed- or real- preferences and stated -or hypothetical- preferences. Revealed or real preferences data usually helps understand preferences under an existing market and technology structure whereas stated or hypothetical preferences data provides insights assuming shifts in technological frontiers or changes in markets configuration. Revealed preference methods assume utility maximizing behavior and infer people's preferences from analyzing how individuals make choices. Studies using revealed preference often analyze choices made by individuals, including natural and designed experiments. Stated preference methods use answers to questions and surveys to elicit what individuals would have chosen and infer preferences for non-market goods.

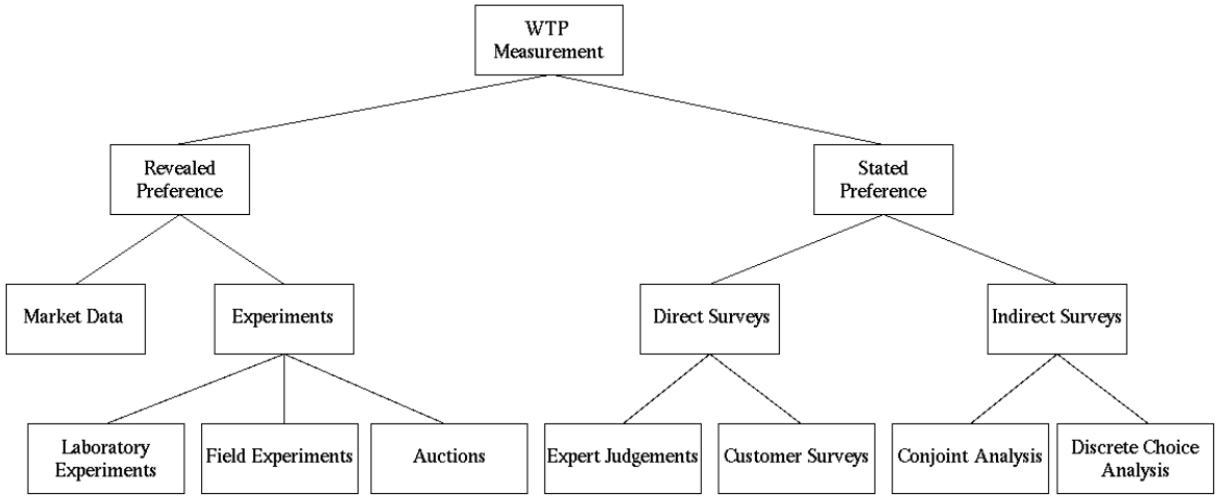
On Figure 17 we show a summary of the characteristics and differences between revealed preferences and stated preferences data:

Figure 17: Differences between, and characteristics of revealed and stated preferences data

Revealed Preferences Data	Stated Preferences data
• depict a world as it is now	• describe hypothetical decision contexts
• have only existing alternatives as observables	• can include existing and/or proposed choice alternatives
• have high reliability	• seem to be reliable when respondents understand, are committed to and can respond to the tasks
• yield one observation per respondent at each observation point	• yield (usually) multiple observations per respondent at each observation point
• reflect more accurately an individual's true preferences	• are more affordable to collect
• are harder to get experimentally	• make it easier to examine a specific research question

Consequently, stated preferences data are usually more interesting for researchers for development, innovation and policy issues because they allow the analysis of hypothetical scenarios or the introduction of new products and/or attributes. Stated preferences can be elicited either through direct or indirect surveys (Figure 18). Stated preference data is usually obtained

Figure 18: Classification framework for methods to measure willingness-to-pay



Source: Breidert et al., 2006

through systematic and planned design where the attributes and their levels are defined beforehand. This reduces the measurement error, which is usually a problem when dealing with revealed preference data. On the other hand, the responses prompted using the stated preference approach are hypothetical, which allows the possibility that an individual might choose an alternative that he wouldn't really take if facing a real decision. This problem is called hypothetical bias and revealed preference data does not suffer from it. Revealed preference data can be criticized for insufficient variation in explanatory variables, high levels of collinearity and inability to incorporate new alternatives that differ in substantive ways from existing ones. A number of studies (e.g. Adamowicz, et al, 1997, Carlsson & Martinsson, 2001) have tested whether there are dissimilarities between revealed and stated preferences data, and the general

finding is that there is no statistically significant difference. Even in those studies that show a statistically significant difference, it is generally small (Lusk & Schroeder, 2004).

There are many different ways to elicit preference information using stated preference data and the one most commonly used are discrete choice experiments. These are indirect surveys that ask respondents to pick their most preferred alternative from a set of options (Carson & Louviere, 2011).

The standard form of the matching approach is the direct question that asks respondents to state their WTP to obtain a particular public good that they do not currently possess. The difficulty with direct questions is that few people think about their WTP for a good, whether a marketed or non-marketed one, which often leads to high non-response rates (Mitchell & Carson, 1989). Part of this problem may stem from the fact that in most industrialized countries, consumers are used to facing posted prices (Carson & Louviere, 2011).

Choice experiments focus on the valuation of separate attributes and use options to weigh that valuation. The type of question typically asked using this method is "which product alternative do you prefer?". Choice experiments differ from conjoint methods in that in the latter individuals are asked to rank or rate alternatives (Adamowicz, et al., 1997). They closely mimic the consumer's typical shopping experience allowing researchers to investigate trade-offs between product characteristics and they can be readily used to estimate the cross-price elasticities between novel and existing products.

5. THEORY

This chapter describes the theories on which this study is based. Some of these topics are Lancaster's theory of demand, the Random Utility model and the conditional logit as an econometric tool for estimating the probabilities of choosing a product with certain attributes given consumer's preferences for those attributes. These theories provide a paradigm that increases understanding of important demand issues such as consumer heterogeneity and product differentiation.

5.1 Consumer Demand Theory

This study is rooted in Lancaster's *"new theory of consumer demand"* (1966), which postulates that consumers derive utility from characteristics or attributes of the good, rather than the good itself.

There are three main assumptions governing this approach to consumer theory:

- The good, per se, does not give utility to the consumer; it possesses characteristics, which give rise to utility
- In general, a good will possess more than one characteristic, and many characteristics will be shared by more than one good
- Goods in combination may possess characteristics different from those pertaining to the goods separately

Another critical assumption of the most general Lancaster model is that the attributes possessed by a good are viewed identically by all consumers. Consequently, the personal element in consumer choice arises only in the choice between collections of attributes.

5.2 Random Utility Model

Random Utility Theory has been widely applied to studies that value consumer preference for products with multiple attributes (Manski, 1977). Random utility theory assumes that individuals seek to maximize their expected utility given their budget constraint. Also, the individual's utility is considered to be a random variable because the researcher has incomplete information (Manski, 1977). We therefore assume that a consumer will attain a certain level of utility from each characteristic of the product and will choose the bundle of attributes (i.e. retailer or beef product), which will maximize his utility subject to his resource allocations or budget constraint.

The random utility model (RUM) can be used to analyze heterogeneity in consumer preferences. A decision maker n, facing various alternatives, will attain a certain level of utility from each of them. Each derived utility can be denoted as U_{nj}. A rational decision maker would choose the utility maximizing alternative. In mathematical notation, alternative j will be chosen over alternative i if and only if

$$U_{nj} > U_{ni} \tag{3.1}$$

We observe the utility maximizing choice. Utility can be decomposed as in:

$$U_{nj} = V_{nj} + \varepsilon_{nj} \tag{3.2}$$

where V_{nj} is the observable, systematic component of the utility associated with the j^{th} alternative and the n^{th} individual, and ε_{nj}, the stochastic component. This component captures the non-systematic (or idiosyncratic) factors that affect utility but that are not included in V_{nj}, such as unobserved variations in tastes and errors in consumer perceptions and optimization.

The researcher observes the determinant component of utility, where

$$V_{nj} = 1 \quad if \quad U_{nj} = \max(U_{n1}, U_{n2}, U_{n3} \ldots . U_{nJ}) \tag{3.3}$$

or $V_{nj} = 0$ otherwise. The probability that individual n chooses alternative *j* among all other alternatives - denoted as *i* - can be expressed as

$$P_{nj} = P(U_{nj} > U_{ni}\,, \qquad \forall\ j \neq i\ ) \tag{3.4}$$

The utilities associated with each alternative are not directly observable in the choice experiment because they include an unobserved component (Equation 3.2). The probability of selecting alternative *j*, therefore, is

$$P_{nj} = P(V_{nj} + \varepsilon_{nj} > V_{ni} + \varepsilon_{ni}\,, \qquad \forall\ j \neq i\ ) \tag{3.5}$$

Through algebraic manipulation, this expression can be stated as

$$P_{nj} = P(V_{nj} - V_{ni} > \varepsilon_{ni} - \varepsilon_{nj}\,, \qquad \forall\ j \neq i\ ) \tag{3.6}$$

This probability is a cumulative distribution, which means that the probability will be that of the random term being below the observed quantity (Train, 2003). Or, in other words, the probability of a randomly drawn individual to choose alternative j out of a certain choice set is equal to the probability that the difference between the systematic utility levels of alternatives j and i is greater than the difference between the random utility of alternatives i and j, for all alternatives in the choice set (Louviere, Hensher & Swait, 2000).

Following Train, the logistic choice probabilities can be derived from Equation 3.5, being the probability of individual *n* choosing alternative *j*

$$P_{nj} = P(\varepsilon_{ni} < \varepsilon_{nj} + V_{nj} - V_{ni}\,, \qquad \forall\ j \neq i\ ) \tag{3.7}$$

Error terms in conditional logit models like this one, are typically assumed to be independent and identically distributed with a type-I extreme value distribution, also known as the Gumbel

distribution. As ε_{nj} is not observable, the choice probability is the joint density function of the random vector $\varepsilon_n = \varepsilon_{n1}, \ldots., \varepsilon_{nJ}$, which can be calculated as the integral of $P_{nj}|\varepsilon_{nj}$ over all values of ε_{nj} weighted by its density. With this density we will make probabilisitc statements about the decision maker's choice. We can write that probability in mathematical notation as

$$P_{nj} = \int \left(\prod_{j \neq i} e^{-e^{-(\varepsilon_{nj} + V_{nj} - V_{ni})}} \right) \; e^{-\varepsilon_{nj}} \; e^{-e^{-\varepsilon_{nj}}} \, d\, \varepsilon_{nj} \tag{3.8}$$

If we manipulate algebraically the expression, we can obtain

$$P_{nj} = \frac{e^{V_{nj}}}{\sum_{i=1}^{J} e^{V_{ni}}} \tag{3.9}$$

Lancaster's theory of demand stated that it is the attributes of goods which derive utility. Stating that in functional form would give us:

$$V_{nj} = \boldsymbol{\beta'}_n \, \boldsymbol{X}_{nj} \tag{3.10}$$

where $\boldsymbol{X}_{nj}$ is a vector of attributes for the j^{th} alternative and $\boldsymbol{\beta'}_n$ is a vector of individual-specific taste parameters for each of the attributes. These measures of attributes can be continuous (as in the case of price) or binary (0 or 1, used for existence or lack of quality attributes). Substituting the later equation into the previous we get the probability of choosing alternative j:

$$P_{nj} = \frac{e^{\boldsymbol{\beta'}_n \boldsymbol{X}_{nj}}}{\sum_{i=1}^{J} e^{\boldsymbol{\beta'}_n \boldsymbol{X}_{ni}}} \tag{3.11}$$

In order to operationalize the model, the researcher has to specify the distribution of the random parameters. This allows us to estimate the distribution of preference parameters for each individual. The traditional approach has been to specify the distribution of non-price coefficients as normal, holding the price coefficient constant. Specifying the distribution of the price parameter as normal would be problematic since a normal distribution would allow positive

values for the price parameter. This is illogical since economic theory predicts that individuals obtain negative utility from an increase in price. Also, a normally distributed price parameter could result in deriving distributions of WTP measures with infinite variances. Because of these reasons most researchers assume a fixed price coefficient. In line with this, once we have estimated the coefficients of the attributes, the willingness to pay for each attribute can be derived. We start by specifying utility as separable in its random parameters price p_{nj} (fixed), and the vector of non-price attributes $\boldsymbol{X}_{nj}$ (normally distributed):

$$U_{nj} = -\beta_p p_{nj} + \boldsymbol{\beta}' \boldsymbol{X}_{nj} + \varepsilon_{\mathrm{nj}} \tag{3.12}$$

Suppose that we let x_1 be an attribute on which we are going to estimate the WTP for a certain individual. We can have two equations of systematic utility, one of them for $x_1 = 1$ and the other for $x_1 = 0$. Namely

$$V_0(x_1 = 1) = \alpha + \beta_1 * 1 + \beta_2 * x_2 + \cdots + \beta_n * x_n + \beta_p * p_1 \tag{3.13}$$

$$V_0(x_1 = 0) = \alpha + \beta_1 * 0 + \beta_2 * x_2 + \cdots + \beta_n * x_n + \beta_p * p_0 \tag{3.14}$$

Setting systematic utilities equal to each other we can solve the right-hand side equation for price, from which we get

$$p_1 - p_0 = -\frac{\beta_1}{\beta_P} = WTP_{x_1} \tag{3.15}$$

Assuming a fixed price coefficient is analogous to assuming that preferences over prices are homogeneous in the population, and implies that the standard deviation of unobserved utility or the scale parameters is the same for all observations. Louviere (2003) argues that the scale parameter can, and indeed often does, vary randomly over observations, and ignoring this

variation can result in erroneous conclusions. In the context of product choice modeling, if the price coefficient is constrained to be fixed, when in fact scale varies over observations, then the variation in scale will be incorrectly attributed to variation in WTP for product characteristics. A solution to this problem is to parameterize the model such that the parameters represent the marginal WTP for each attribute rather than the utility coefficient of each attribute. The appeal of this approach is that it allows the researcher to specify and estimate the distributions of WTP directly (this approach is often referred to estimation in WTP space), rather than deriving them indirectly from distributions of coefficients in the utility function as in equation 3.9 (Scarpa et al., 2008). To estimate our model in WTP space, we follow Train and Weeks (2005). We divide utility in equation 3.11 by a scale parameter k_{nj} to reparametrize the model, resulting in

$$V_{nj} = -\lambda p_{nj} + (\lambda_i \boldsymbol{\omega}_i)' \boldsymbol{X}_{nj} \tag{3.16}$$

where the coefficient λ is defined as $\lambda_{nj} = \gamma_{nj}/k_{nj}$ and $\boldsymbol{\omega}_i = \beta_{nj}/\gamma_{nj}$ is a vector of WTP for the product attributes that is independent of scale (Train & Weeks, 2005). Past research (Scarpa, et al., 2008) has found that estimating respondents' values in WTP-space addresses the "fat tail" problem of reporting many extreme values, which takes place when estimating WTP in preference space.

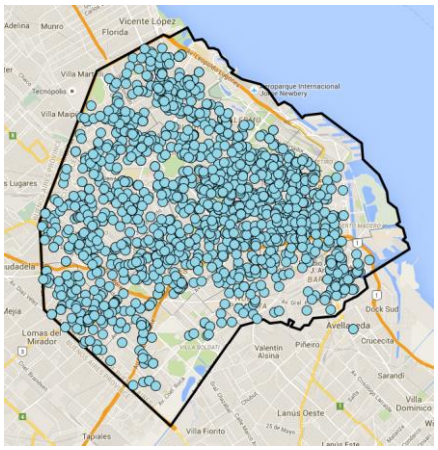
6. DATA

Because data on consumer preferences for retailer and beef product is not available at the attribute level, collection of primary data was necessary. Three hundred and six people were intercepted at different beef purchasing locations in the city of Buenos Aires between July 15th and 25th, 2015. The survey was administered by trained Agricultural Engineering undergraduate students from a local University. Prior to this, there was a period of refinements to the questionnaire based on preliminary market research through focus group meetings, and a week of pilot testing. This chapter discusses the construction of the dataset along with potential control issues and concerns that may arise in analyzing the data and interpreting results.

6.1 Sampling Frame

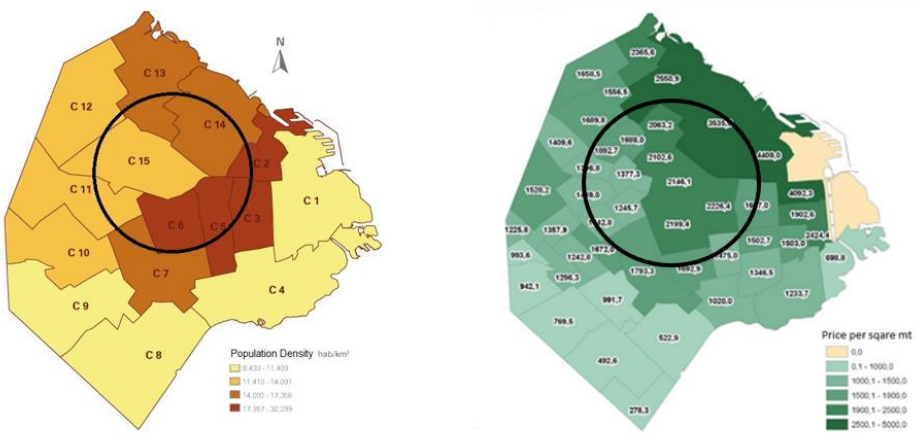
The sampling frame was comprised of a list of 1,980 meat retailers. This list, which was generously provided by an employee of the City Store Occupancy Office, included almost all of the meat retailers in the city (Figure 19). The black line represents the city limits.

Figure 19: City of Buenos Aires and sampling frame



Due to budget constraints, it was not feasible to sample the complete city of Buenos Aires. Therefore, we decided to focus in the central area of the city (Figure 20) because that

Figure 20: Population density and property prices in Buenos Aires



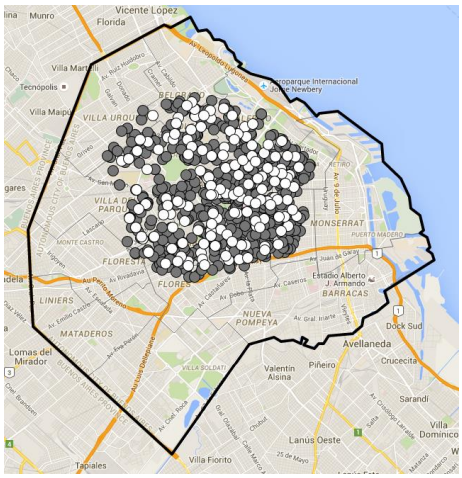
Source: Buenos Aires City Council

allowed us to sample heterogeneous neighborhoods within a relatively short distance. The fact that the distances were relatively short assured that consumers surveyed were subject to comparable purchasing opportunities, namely similar stores, store distribution and store density. The area covered was approximately 14,000 acres, approximately 30% of the city area. We discarded the least populated districts as consumers found there would most likely be working but not living in the area, and therefore they would not be representative of meat consumption and purchase patterns.

The total number of retailers in the central area of the city was 765 at the time of the study, including mini-markets, butchers shops, Chinese markets, supermarkets and mini supermarkets (which included hard discount stores). We divided this list in “small” and “large”

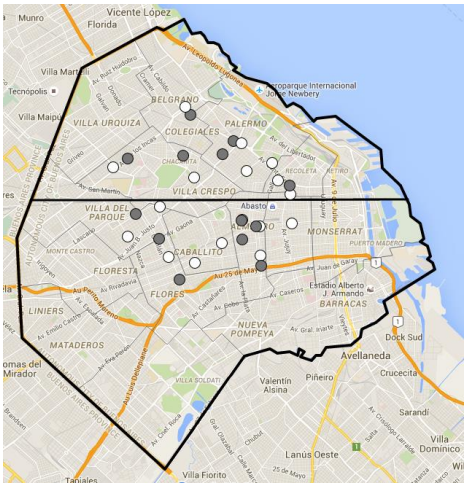
retailers. The small retailers group was comprised of mini-markets, butchers and Chinese markets, and the large retailers list was comprised of supermarkets and mini supermarkets. We used this criteria because in "small" stores, the butcher is either an independent businessman or a party in an agreement between two retailers. In "large" stores either there is no butcher, or if there is one, he is a store employee. Six hundred and fifteen of the retailers in this area of the city were in the "small" category, and 150 were classified as "large". Small and large retailers were distributed homogeneously in the area selected (Figure 21 – small in dark, and large in light).

Figure 21: Location of small and large retailers in the center of the city



We divided these stores in 15 sub areas, each of which had 10 "large" stores and 41 "small" stores. Enumerators were sent in pairs and instructed to select randomly one large and one small retailer in each sub area from a pre compiled list. Enumerators were assigned randomly to the various sub areas and types of stores. This resulted in a total of 30 stores in which surveys were conducted: 13 small stores and 17 large stores. Each enumerator administered 5 surveys in each location, resulting in 10 surveys per location for a total of 306 surveys. Figure 22 shows the survey locations (small in dark, and large in light). The horizontal

Figure 22: Survey locations



line divides the city in North and South. At the time of the study, 1 AR$ could be converted into 0.1 US$. In the North, the mean household per capita income for the first trimester of 2015 was AR$ 10,021 (roughly US$ 1,000) and for the South it was AR$ 7,873 - almost US$ 800 (Direción General de Estadística y Censos de la Ciudad de Buenos Aires, 2015).

Surveys were conducted at each selected location with randomly selected meat buyers. A monetary incentive was offered for participating in the survey. This ensured strong representation of the sample across different consumers, types of sores and geography of the city. In Table 5 and 6, we summarize some characteristics of our sample.[1]

Consumers were asked to describe their current butcher by selecting characteristics from a list and/or by adding new ones. In addition, there was a Likert scale question that allowed them to state how important was the retailer in their product quality perception, from not important to very important. A copy of the survey questionnaire is in the appendix, being the Spanish version

[1] These results are comparable to those obtained in the last census in Argentina, executed in 2010 (INDEC).

Table 5: Sample characteristics

Store Type (%)	
Butcher-Type of Stores	
Butcher	14.05
Mini market	8.17
Chinese Market	20.26
Supermarket-Type of Stores	
Supermarket	20.92
Mini Supermarket	36.6
Neighborhood (%)	
North-West	18.63
North-East	28.1
South-West	25.16
South-East	28.1

Table 6: Descriptive statistics

Gender (%)	
Male	31.37
Female	68.63
Age	
Mean and Median	52
Standard deviation	16
Education (%)	
Primary	10.13
Secondary	51.31
Undergraduate	33.33
Graduate	5.23
Household Monthly Income (%)	
7,500 AR$ or less	19.6
12,500 AR$	25.82
17,500 AR$	26.8
22,500 AR$	19.28
22,500 AR$ or more	8.5
Household Size (%)	
1	17.32
2	31.05
3	20.59
4 or more	31.04
Household weekly per capita meat consumption (%)	
Less than 0.5 kilograms	24.92
0.5 – 2 kilograms	62.62
More than 2 kilograms	12.46

Appendix C, and the translation into English Appendix D.

The values reported in Table 7 are percentage of consumers choosing selected options when describing their current butcher, and percentage of consumers reporting using the retailer as a very important quality cue. This is the percentage of consumers choosing the highest rating on the Likert scale only.

Table 7: Behavioral/attitudinal characteristics of the sample

Price Advice from Butcher (%)	15.69
Long-term Butcher (%)	33.33
Reliability in Butcher (%)	61.11
Retailer as a Very Important Cue in Beef Quality Perception (%)	69.28

6.2 Choice Experiments

Because consumer data on store and product attributes was not readily available, we elicited preference for selected retailer and beef product attributes using choice experiments. Choice experiments are based on random utility theory and are consistent with Lancaster's theory of utility maximization. The survey was composed of two separate choice experiments – one for store attributes and one for beef attributes. Every consumer performed one choice experiment for retailer's attributes, and one for beef steak attributes.

The choice experiment approach implies providing the respondent with a set of alternatives with different attributes, among which the subject chooses. This way it mimics the real purchase situation wherein the customer examines different varieties of the product and then chooses one of them or none at all.

The three main characteristics for choice sets in discrete choice models were established by Train (2003). Train determined that attributes have to be mutually exclusive – choosing one alternative automatically means not choosing any other. They also have to be exhaustive – all possible alternatives are included ("none of the above" alternative in the choice set). And finally, respondents need to be presented with a finite number of alternatives.

In our study, we focus on extrinsic cues—such as place of purchase—because there is a widespread opinion that the use of them for quality inference is and will be increasing (Bernues et al., 2003). According to Grunert (2006), extrinsic cues have a considerable potential for playing a larger role in the way in which consumers perceive meat quality. And with respect to the beef product itself, we decided to focus on beef credence attributes—such as organic production—because they are ubiquitous in today's marketing of food products, and their importance relative to search and experience characteristics is increasing (Grunert et al., 2000).

The choice experiments were made up of 6 choice sets or choice tasks each. Each choice set or task consisted of two product alternatives (and a no purchase option). Each alternative contained 4 attributes with two to four levels each.

For the store choice experiment, we wanted to determine if consumers have a preference for butcher stores due to a preference for small stores, or if what consumers are really fond of is the service a knowledgeable person can give. It could be the case that consumers relate the butcher store with a butcher that is knowledgeable. If this was the case, supermarkets would benefit from binding with experienced butchers. But it could also be the case that consumers have a preference for butcher stores because they like small stores, independently from whether the person that runs them is an expert or not. Or they may prefer a combination of big stores run by skillful beef sellers. For that reason, we included an attribute for Firm Size and one for Butcher.

We selected three levels that referred to Firm Size: Small, Medium and Large. Firm categories were defined by total number of employees in all known locations. This approach has been used by Sevilla and Soonthornthada (2000), Lertwongsatien and Wongpinunwatana (2003), Altenburg (2000), Ayyagari and Demirguc-Kunt (2007), Vives (2006) and Fitjar and Rodríguez-Pose (2011), and it's based on the European Union Law. The number of employees used on these studies depended on the context, but it was always lowest for the retailing sector (as compared with the production, service and wholesale sectors). In this study, small firms were defined to have less than 5 employees, medium between 5 and 15, and large more than 15. This attribute intended to capture a social ideology that supports small-scale and locally owned businesses. If results show that consumers are not really interested in small stores, but they still make most of their purchases from butcher shops, it may be the case that they prefer the level of customer service. To determine how consumers value their current butcher we included four levels on the butcher attribute: absent, new, current and ideal. An absent butcher means that meat is only accessible on shelves. A new butcher is one who provides customer service, but for whom the consumer has no reference; no relationship exists. The current butcher was defined to be each of our respondents' current butcher, and they had the opportunity to define him in another section of the survey. We also included an ideal butcher option, to give respondents a chance to compare their current butcher to somebody that is "the best beef provider you could imagine according to your own parameters." Consumers were noy required to describe their idea of an ideal butcher. They were only asked to describe their current retailer. The last attribute in the retailer choice experiment was beef product variety. This was due to the fact that consumers are exposed to varied levels of variety in different beef retailing locations. It is interesting to note that in Argentina, high variety of beef products is not necessarily associated with supermarkets. Higher

beef product variety levels are in general more associated with butcher shops, although this is not necessarily a rule. Including this variable allowed us to disentangle if this is really the attribute consumers are after when buying meat at butcher shops. Variety was defined as a function of the type of beef products offered. Availability of only beef was considered to be low variety, beef and sausage defined the medium level, and high variety was defined as beef, sausage, and offal. We also included a time variable which was defined as the amount of minutes to be spent in the purchase, including travelling time and time spent in the location. This allowed us to investigate trade-offs between attributes by deriving consumers' willingness to trade time for the store attributes included in the choice scenarios.

Following, in Table 8, we can see a summary of the attributes and levels for the first choice experiment, which referred to the meat retailer's selection:

Table 8: Attributes and levels of the beef retailer choice experiment

Size of Firm	Butcher	Variety	Time (minutes)
Small	Absent	Low	10
Medium	New	Medium	20
Large	Current	High	30
	Ideal		60

Beef quality has many dimensions. We are interested in determining if consumers have any preference for characteristics of the production firm or farm. We conveyed different types of farms using a Name of Farm attribute. We selected four levels. The first one was No Information. Of the other three, one conveyed a family-type of farm, such as Mr. John X (*Carnes Don Juan Vaca*). Another one conveyed a simple incorporated farm (*Vaca S.A.*). It was different from the previous one in that this name included the "Inc." at the end, and excluded the "Mr.

John" part. In the Argentinian context, supermarkets have started offering brands that refer to integrated farms. These brands usually are called "Breeding and Ranching X". We then chose a name that was similar to the other two, but that had the "Breeding and Ranching" denomination, and also included the "Inc." part (*Cabaña y Estancia Vaca S.A.*). Integrated farms are those that raise cattle from the moment they are born to the moment they reach commercial weights and are sold to slaughterhouses. These firms are usually richer in assets, whereas small producers usually do one of the two stages: they either breed and sell calves to "finishers", or they buy the calves and do the final part of the cycle until the animal reaches commercial weight. Since the farm type does not necessarily convey feeding practices, and feed is what ultimately determines beef taste, we had to include an attribute that gave consumers an idea of how cattle had been fed. We could have chosen a simple grass-fed attribute with yes or no levels, but feeding practices can be a lot more varied that that, and the grey areas are many. We therefore decided to use an existing label, the Organic label. The organic claim in Argentina is regulated by Law 25.127. To certify as organic, farms do not necessarily have to feed cattle with grass all the time. They are allowed to use concentrates but only in certain times of the year (winter) and in a certain quantity or proportion with respect to grass. In addition, according to this bill, organic production systems are those that preserve the environment, avoid the use of chemicals and treat animals humanly, so we englobed many sub-attributes here that, if resources had permitted, could have been broken apart. So, this attribute refers to the presence or absence of the Organic claim approved by the Argentine Agriculture Agency. Figure 23 shows the label.

Finally, the literature has investigated widely the influence of origin claims in consumer preferences, and there are usually high levels of utility derived from this attribute. We thought that this would also be the case in this context. This could be the case, however, for many

Figure 23: Argentine official organic label

different reasons. The city where the study took place is immersed in the most fertile lands and therefore the ones with higher beef quality. But we also wanted to know if there could be a nationalism effect. We were lucky that comparably fertile lands exist in a neighboring country, so we included that country as one of the levels. Uruguay has comparable beef quality and is in the same region as Buenos Aires. If Buenos Aires was preferred to Uruguay, we could discard a preference for high beef quality or a regionalism effect. In order to determine if, given a nationalistic effect, there was a preference for the local instead of the merely national, we included a different Argentinean province, San Luis. We also included a No Information level.

The product selected for this experiment was a kilogram of young steer's sirloin steak (bife de chorizo de novillito). We selected this product because it is very common, yet slightly expensive. It is for this type of product that consumers might be willing to pay a premium for these attributes. We used a price attribute to investigate trade-offs between beef steak characteristics by deriving willingness to pay for them. The levels for the price attribute were selected through primary market research on focus groups that we performed in Argentina prior to the study. A summary of the attributes present in the choice experiment are presented in Table 9.

Choice sets were created using an unlabeled, efficient, blocked design with a no choice option in Ngene (ChoiceMetrics, 2011). Below, we show sample choice sets for the retailer (Figure 24) and for the beef (Figure 25) choice experiments.

Table 9: Attributes and levels of the beef steak choice experiment

Name of Farm	Organic Claim	Origin	Price per Kilogram
No Info	Absent	No Info	AR$70
"Carnes Don Juan Vaca"	Present	San Luis	AR$100
"Vaca Inc."		Buenos Aires	AR$130
"Cabaña y Estancia Vaca Inc."		Uruguay	AR $160

1 AR$ = 0.1 US$

Figure 24: Sample of the beef retailer choice experiment

	Option A	Option B	Option C
Size of Firm	Medium	Medium	I wouldn't go to either store
Butcher	Ideal	Absent	
Variety	Low	High	
Time (minutes)	20	30	
My choice:	◯	◯	◯

Figure 25: Sample of the beef steak choice experiment

	Option A	Option B	Option C
Name of the Farm	No Info	Cabaña y Estancia Vaca Inc.	I wouldn't buy either product
Organic Claim	Present	Absent	
Origin	San Luis	San Luis	
Price (AR$/kilo)	130	100	
My choice:	◯	◯	◯

In order to calculate the sample size required for the main effects we used the method suggested by Johnson and Orme (2003). The recommended sample size depends on the number of choice tasks, the number of options (excluding the no-choice option), and the largest number

of levels for any of the attributes. The relationship among these variables is described by the following formula:

$$N > \frac{500 * levels}{tasks * options} = \frac{500 * 4}{6 * 2} = 167$$

There's one requisite, which is fulfilled as shown below:

$$tasks * (options - 1) > attributes + 1$$

$$6 * (2 - 1) > 4 + 1$$

Our sample size exceeded 167, therefore we can conclude that our design gave us enough degrees of freedom for the analysis.

6.3 Control Issues and Concerns

In this section we address some of the issues that can arise from our data.

6.3.1 Selection Bias

The respondents were all main household shoppers buying meat at random stores in the City of Buenos Aires. We could infer that people who were more interested in the topic of study or had more time available elected to participate in the survey. The fact that we used a monetary incentive could also be considered as a potential source of selection bias. For all these reasons the resulting group of respondents might be different than the average population, or from future or past shoppers. Therefore, the results of the analysis should not be extended to the entire Argentinean population or over time.

6.3.2 Hypothetical Bias

Hypothetical bias is the difference between what a person indicates that he/she would do versus what he/she would actually do in real life (Loomis, 2014). Hypothetical bias can be addressed through different survey designs. Possible *ex ante* survey tools include cheap talk, including an opt-out alternative, and urging honesty statements. Cheap talk reduces hypothetical bias by stating the problem of hypothetical bias explicitly to the participant. Often cheap talk is a script that states that in past surveys consumers often overstated their willingness to pay. Loomis' review of studies that used cheap talk, showed that while some studies were able to eliminate or reduce hypothetical bias, the effect was not universal (Loomis, 2014). Cummings and Taylor (1999) compared revealed and stated preference experiments in three separate studies and were able to eliminate hypothetical bias by using a cheap talk script. Many studies that elicit stated preferences use cheap talk to address potential hypothetical bias (Tonsor & Wolf, 2010; Lusk, 2003, and Aadland & Caplan, 2003). The urging honesty method differs from cheap talk by not explicitly stating that people overstate or understate their true choice in a hypothetical scenario. Rather, urging honesty is commonly seen as a statement in the beginning of a survey, in which the participant swears to answer questions truthfully. A study where students were asked to sign an oath of honesty found that signing the oath was able to eliminate hypothetical bias in the survey (Stevens et al., 2013). Loomis (2014) suggests researchers to use either the cheap talk or urging honesty methods because there have been cases where using cheap talk along with urging honesty has overcorrected for hypothetical bias. Moreover, including an opt-out or null alternative in discrete choice experiments avoids forcing the individual to choose between goods and skewing results (Hensher, 2010). This better replicates real world scenarios,

since consumers often choose between similar goods or not purchasing the good at all. Our survey included a no choice option in our choice sets and an urging honesty statement.

7. RESULTS

This chapter presents and interprets the results of the econometric estimation of consumer preferences for store and beef attributes.

7.1 Preferences for Store Attributes

In this section we discuss the results for store attribute preferences. We first show the mean marginal utility (preference) results for the consumers in our sample. Then, we explore the sociodemographic/ behavioral/attitudinal variables that might determine consumers' preferences. In addition, we study the dynamics of demand for the most highly demanded attributes. Finally, we find classes or profiles of consumers with similar preferences.

We estimated preferences for store attributes using Multinomial Logit (MNL) and Random Parameters Logit (RPL) models.[2] The Random Parameters Logit model in preference space fit the data better than the Multinomial Logit Model, and Effect Coded data yielded higher log likelihood values than Dummy Coded data (Table 10). This type of coding eliminates the potential confounding effects between the intercept and the attribute levels (Bech & Gyrd-

Table 10: Log likelihood values for dummy and effects coded data on a RPL model and a MNL model with the same specification for store experiment

	MNL	RPL
Dummy Coded	-1133.5	-1000.4
Effects Coded	-1133.5	-993.93

[2] We focus on preference space results because the RPL model in WTP space did not converge.

Hansen, 2005)[3], namely an attribute's coefficient is just in comparison to the opt-out option. For this reason, the model used to estimate preference heterogeneity for the store experiment was a RPL model with effects coded data. On Table 11 we show the results from the RPL model in preference space. WTT is the mean willingness to spend time, in minutes.[4]

Table 11: Parameter estimates from RPL model for store attributes

	Mean Parameter Estimates	Standard Deviation Estimates	WTT
Time	-0.151 (0.029)***		
Firm Size			
Big	-0.955 (0.618)	1.250 (0.368)***	-11.45 [-21.93, 4.27]
Medium	-0.168 (0.709)	1.830 (0.690)***	-2.37 [-21.36, 16.21]
Butcher			
New	1.467 (0.969)	4.356 (0.703)***	21.13 [-4.09, 56.19]
Current	2.697 (1.263)**	4.750 (0.789)***	38.58 [4.81, 86.49]
Ideal	2.277 (1.037)**	3.906 (0.685)***	33.03 [3.17, 77.04]
Variety			
High	2.943 (0.981)***	3.510 (0.734)***	41.80 [12.29, 88.09]
Opt Out	-13.329 (2.308)***	7.060 (1.578)***	
Log Likelihood	915.49		

*** Denotes significance at the .01 level, ** Denotes significance at the .05 level, * Denotes significance at the .1 level
Estimated using NLogit 4.0. Numbers presented in parenthesis are standard errors.
Values in brackets correspond to a 95% confidence interval built using the Krinsky-Robb parametric bootstrapping method.

Significant standard deviation estimates assert our hypothesis that preferences are heterogeneous for all of the attributes. Consumers are willing to spend up to 42 minutes to make their beef purchases at a store that offers high variety, 39 minutes to buy from their current

[3] With effects coding, the attributes take the value of 1 when present, the value of -1 when not present, and zero otherwise. For more information on effects coding refer to Bech and Gyrd-Hansen (2005).
[4] In this analysis, the WTT calculation is multiplied by two due to our use of effects coding (Lusk et al., 2003)

butcher and 33 minutes to buy from their ideal butcher. The fact that the WTT for their current butcher is higher than for an ideal butcher shows an attachment effect such as those found by McGraw and Tetlock (2005). Even though this may seem counter intuitive, these authors explained the role of social relations by arguing that consumers have a hierarchy of metagoals that they use in decision making, and that depending on the goal (whether it is maximizing accuracy, minimizing effort, reducing stress, or maximizing evaluations of oneself), the decisions made, the judgments produced, and the market prices one is willing to pay will systematically vary, yielding exceptions to the principles of multiattribute utility theory. Consumers had been instructed to think of an ideal butcher as "the best beef provider you could imagine according to your own parameters." The median amount of beef purchase trips for consumers in our sample was 1.25 times per week, while the median amount of grocery store visits was 3.25 per week. It is also worth noting that these results are upper bounds, i.e., maximum amounts of time that consumers would be willing to spend.

The parameters were found to be correlated (Tables 12 and 13), so a specification with correlated parameters was used. This is also justified by a high improvement of the log likelihood at convergence - the log likelihood for the model with correlated parameters can be verified on Table 11 and the one for the model that didn't allow for correlated coefficients is on Table 10. This method is descrived by Greene and Hensher (2010), and has been applied in other studies (Tonsor et al., 2009; Sagebiel, 2011; Sarrias, 2015, Ortega et al., 2015). These results can be interpreted as follows: consumers who are interested in big stores are also willing to buy from medium stores, but not from stores in which a butcher is present or that offer high variety. Consumers that prefer their current butcher over the other options, are likely to prefer an ideal

butcher on the second place and a new one on the third place. Consumers that are willing to try a new butcher are also looking for variety.

Table 12: Cholesky matrix for store coefficients

	Firm Size		**Butcher**			**Variety**
	Big	Medium	New	Current	Ideal	High
Firm Size						
Big	1.562					
Medium	0.958***	3.347				
Butcher						
New	-2.077***	-4.113***	18.974			
Current	-1.256***	-3.815***	0.278***	22.562		
Ideal	-1.271***	-3.519***	3.084***	15.669***	15.257	
Variety						
High	-1.388***	-3.288***	6.479***	12.032	7.670	12.319

*** Denotes significance at the .01 level, ** Denotes significance at the .05 level, * Denotes significance at the .1 level

Estimated using NLogit 4.0

Table 13: Correlation matrix for store coefficients

	Firm Size		**Butcher**			**Variety**
	Big	Medium	New	Current	Ideal	High
Firm Size						
Big	1.000					
Medium	0.419	1.000				
Butcher						
New	-0.261	-0.756	1.000			
Current	-0.145	-0.643	0.013	1.000		
Ideal	-0.178	-0.721	0.181	0.845	1.000	
Variety						
High	-0.216	-0.750	0.424	0.722	0.559	1.000

Estimated using NLogit 4.0

We explore determinants of consumer behavior using a Seemingly Unrelated Regression (SUR) model. We find that WTT results can be explained by a number of socio-demographical and behavioral variables (Table 14). Age has a negative correlation with the idea of a perfect

Table 14: Determinants of store attribute preference

	Firm Size		**Butcher**			**Variety**
	Big	Medium	New	Current	Ideal	High
North	0.83	2.04	-6.66	-7.80	-5.05	-0.12
Female	1.14	2.78*	-2.05	-1.55	-0.89	-0.37
Age	0.09	0.26	0.40	0.92	0.97	-0.88
Agesqr	0.00	0.00	-0.01	-0.02	-0.01*	0.01
College Ed	-1.78	-2.21	-3.25	-4.63	-4.14	0.17
Income percap	0.00	0.00	0.00	0.00	0.00	0.00
Married	1.79	0.58	6.64	7.05	5.28	4.31
KBPC	0.60	3.03	-15.14	-18.61*	-13.95	2.71
Retailer as Cue	0.00	-0.67	4.07**	4.35**	2.65	2.74
Known	-1.76	-0.04	2.83	6.10	4.34	-6.70
Trust	0.64	0.63	0.45	0.52	0.49	2.52
Price Advice	-1.49	-2.79	12.20**	16.82**	13.25**	-1.77
Constant	-13.94**	-10.22	8.07	12.36	10.06	50.42**
Observations	305	305	305	305	305	305
R-squared	0.055	0.036	0.106	0.121	0.110	0.049

*** Denotes significance at the .01 level, ** Denotes significance at the .05 level, * Denotes significance at the .1 level
Estimated using Stata.

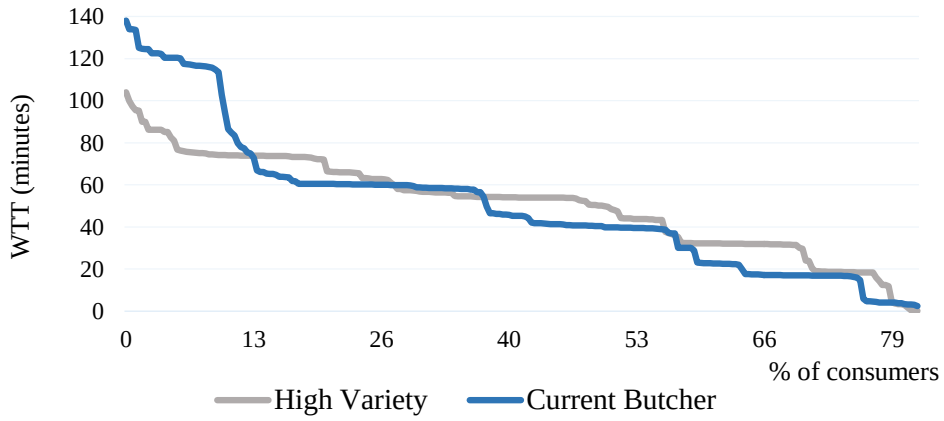
butcher, namely the more experienced the person, the less likely he or she is willing to spend time to find out what that "ideal butcher" is like. The beef steak consumption level is negatively correlated with the preference for the current butcher: for every kilogram extra of beef consumed per capita in the household, there is a willingness to spend 18.61 minutes less on the purchase. For every extra point reported on a 1-to-5 Likert scale on the importance of the retailer as a cue for the inference of beef quality, there is an increase in the WTT for the current or the ideal butcher of 4 to 5 minutes. Butchers that provide budget advice have a positive relationship with consumers' preferences for new, current and ideal butchers. It is also worth noting that

neighborhood, gender, college education, marital status, and income do not explain consumer preferences for store attributes.

One of our objectives was to better understand drivers of store patronage. The two most preferred store attributes are High Variety and Current Butcher. Following, we focus our analysis on consumers' preference heterogeneity for these attributes.

Average willingness to spend time is higher for the High Variety attribute than for the Current Butcher attribute, according to the RPL results. However, demand can be higher for a known butcher than for High Variety (Figure 26). The slope of the demand curve is steeper for

Figure 26: Demand curves for selected store attributes



the Current Butcher attribute than for the High Variety one. This indicates that demand for this attribute is more inelastic, i.e., that consumer demand for the Current Butcher does not change much with changes in time needed to get this attribute, whereas demand for High Variety stores does change with changes in time needed to reach them and make the purchase there. Demand curves are constructed combining individual WTT results, which were obtained from model

results as done by Revelt and Train (2000). For more information on obtaining individual-level parameters, please refer to "Discrete Choice Methods with Simulation", page 259 (Train, 2003). It is worth noting that approximately 20% of the consumers in the sample had negative WTT for the high variety and current butcher attributes.

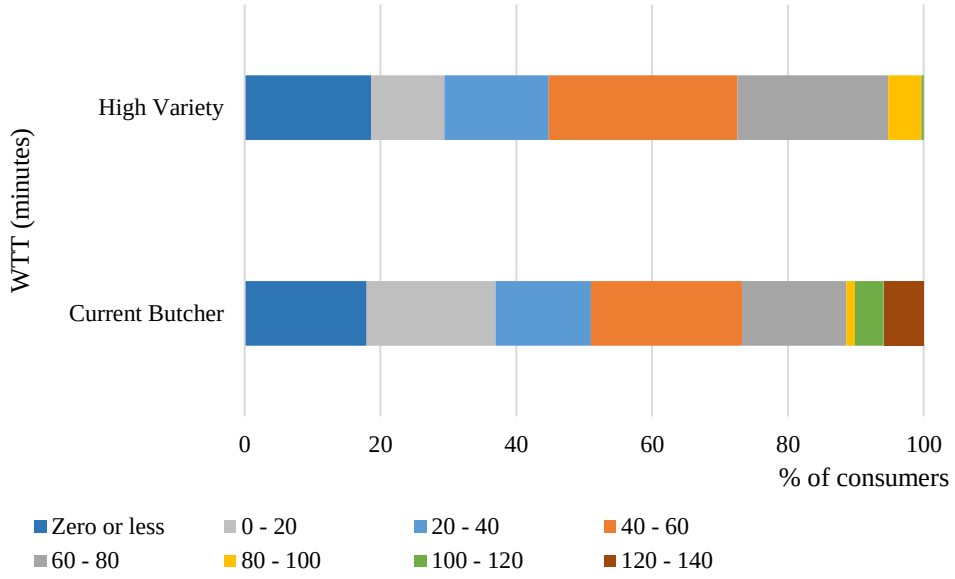
Our next step was dividing consumers' WTT results in groups, depending on how much they were willing to travel to access various attributes. Table 15 shows the percent of consumers with WTT up to specified values, in 20 minute increments, for all store attributes. The first column corresponds to consumers willing to spend zero minutes or less, the second between zero and 20, and so on. Figure 27 shows these results in graphical form, only for the attributes with the highest preferences (Current Butcher and High Variety). Ten percent of the customers are

Table 15: Percent of consumers with up to selected WTT

WTT (minutes)	0	20	40	60	80	100	120	140	Total
Firm Size									
Medium Store	65	31	3						100
Big Store	96	4							100
Butcher									
New Butcher	26	22	35	7		9	1		100
Current Butcher	18	19	14	22	15	1	4	6	100
Ideal Butcher	18	26	18	25	4	6	3		100
Variety									
High Variety	19	11	15	28	22	5			100

willing to spend large amounts of time (100 minutes or more) to shop with their current butcher. None of the consumers are willing to spend that amount of time to get higher variety. Similarly, 19% of the consumers are willing to spend up to 20 minutes to buy from their current butcher, while only 11% of the consumers are willing to spend that time to get high variety. However, for medium WTT values, variety was preferred by more consumers. Seventy percent of

Figure 27: Percent of consumers with up to selected WTT for selected attributes

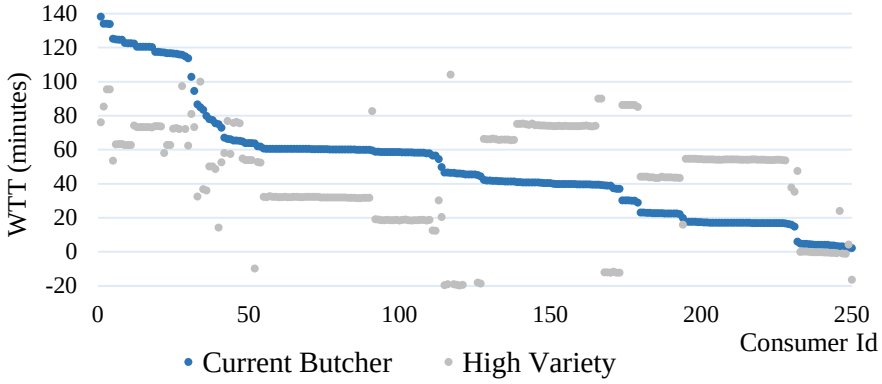


consumers are willing to spend between 40 and 100 minutes to get high variety, while consumers willing to spend that range of time for purchasing from their current butcher are less, 52%.

Results so far support the finding that preferences for the majority of the consumers are higher for the High Variety attribute. However, there is strong heterogeneity, and 30% of consumers have strong preferences for the Current Butcher attribute. These results do not necessarily imply that consumers who have high WTT for the Current Butcher also have high WTT for High Variety or the other way around, nor that there are significantly different groups of consumers.

To explore individual consumers' preferences for these two attributes, we built a graph relating consumers' individual WTT for the Current Butcher attribute, sorted from highest to lowest – namely the demand curve for Current Butcher, with each specific individual's WTT to get High Variety (Figure 28). In this graph we can identify a group of shoppers that have high

Figure 28: Preference for current butcher and demand for high product variety



preferences for the Current Butcher Attribute and lower preferences for the High Variety Attribute (the left half), and a group of customers that have low preferences for the Current Butcher attribute with higher preferences for the high variety attribute (roughly, the right half portion of the graph). This indicates that consumers have preferences for either one or the other of these two attributes, almost as if they could be substitutes of each other.

In order to further test the existence of homogeneity within and heterogeneity among the groups that appear to be in the graphs, we estimated a Latent Class model (Table 17). Based on model fit criterion, we determined that an adequate number of classes for our dataset was two. Based on the preference profiles, we find that 67% of the respondents are more likely to be "Convenience Oriented" customers. The WTT for the High Variety attribute for this group is 20 minutes, and it's the only attribute for which there is a positive significant preference. Thirty-three percent of the consumers can be classified as "Service Oriented". They are willing to spend over two hours to get service from their current or an ideal butcher instead of purchasing their beef from a store shelf. They are also willing to spend almost one hour to get high variety, and an hour and a half extra for an unknown butcher. "Service Oriented" customers are more likely to live in the south of the city, and to report getting price advice from their current butchers and

Table 16: Latent classes for store preferences

	Class 1: Convenience Oriented		**Class 2: Service Oriented**	
	Parameter Estimates	WTT	Parameter Estimates	WTT
Time	-0.064 (0.011)***		-0.041 (0.007)***	
Firm Size				
Big	-0.413 (0.229)*	-11.96 [-20.47, 1.16]	-0.177 (0.168)	-7.92 [-20.61, 9.66]
Medium	-0.162 (0.232)	-3.94 [-17.43, 11.48]	-0.148 (0.149)	-6.61 [-18.18, 8.64]
Butcher				
New	-0.431 (0.234)*	-13.13 [-24.07, -0.65]	1.839 (0.227)***	91.77 [53.39, 152.52]
Current	-0.125 (0.283)	-2.71 [-16.82, 18.61]	2.973 (0.272)***	148.12 [93.26, 238.11]
Ideal	-0.137 (0.250)	-2.70 [-14.96, 16.22]	2.448 (0.266)***	122.11 [73.11, 200.39]
Variety				
High	0.583 (0.218)***	20.16 [4.25, 45.87]	1.110 (0.199)***	55.83 [27.61, 102.83]
Opt Out	-3.696 (0.341)***	-120.98 [-194.74, -73.15]	-5.244 (0.393)***	-260.49 [-409.01, -171.96]
Class Membership Covariates				
North	0.679 (0.344)**			
Price Advice	-1.417 (0.442)***			
Known	-0.847 (0.344)**			
Class Prob	0.674		0.326	
Log Likelihood	-1032.071			

*** Denotes significance at the .01 level, ** Denotes significance at the .05 level, * Denotes significance at the .1 level

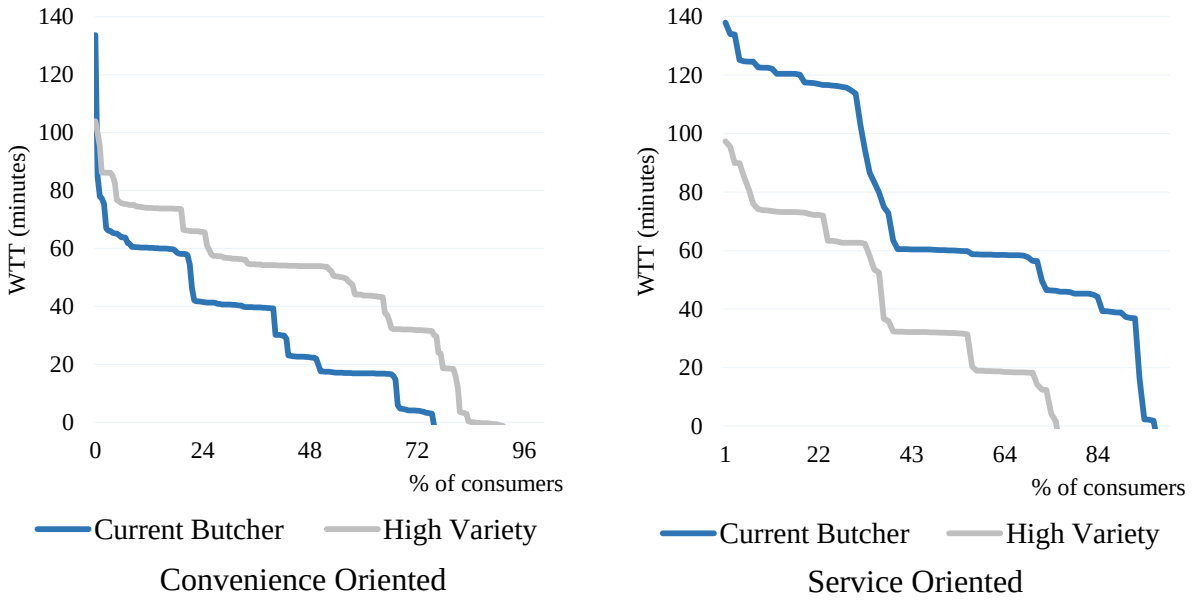
Estimated using NLogit 4.0. Numbers presented in parenthesis are standard errors.

Values in brackets correspond to a 95% confidence interval built using the Krinsky-Robb parametric bootstrapping method.

having known them for a long time. These results are upper bounds, i.e., maximum amounts of time that consumers in each group would be willing to spend.

The demand curves for the Current Butcher and High Variety attributes for these customers are shown on Figure 29. “Convenience Oriented” consumers (left) have a higher demand for the High Variety attribute than for the Current Butcher attribute; for “Service Oriented” consumers it’s the opposite.

Figure 29: Demand curves for convenience and service oriented customers



In conclusion, almost 70% of the consumers are just trying to save time and get a somewhat significant level of variety. Thirty percent are trying to get good service and high variety, and they are happy to spend high amounts of time for it. These preferences are affected by retailer's attributes such as the ability to build a relationship with the customers and provide advice.

7.2 Preferences for Beef Steak Attributes

In this section we discuss the results for beef steak attribute preferences. We first show the mean preferences results for the consumers in our sample. We also explore the sociodemographic/behavioral/attitudinal variables that might determine consumers' preferences. Then, we study the dynamics of demand for the most highly demanded attributes. And finally, we find consumer profiles.

Preferences for beef attributes were estimated using a MNL model and a RPL model[5]. The Random Parameters Logit model on preference space fit the data better than the Multinomial Logit Model; our data was effects coded (Table17).

Table 17: Log likelihood values for dummy and effects coded data on a RPL model and a MNL model with the same specification for beef steak experiment

	MNL	RPL
Dummy Coded	-1359.12	-1060.30
Effects Coded	-1359.12	-1056.05

For this reason, the model used to estimate preference heterogeneity for the beef experiment was a RPL model with effects coded data. On Table 18 we show the results from the RPL model in preference space. WTP is the mean willingness to spend money, in AR$[6].

Preferences are heterogeneous for all attributes except San Luis origin. On average, consumers are willing to spend up to AR$ 58.63 per kilogram (1 AR$ = 0.1 US$) to get Buenos Aires (i.e., local) certification on their beef steak, and AR$ 57.66 per kilo to get Organic certification. These values are around US$ 2.5 per pound, taking into account the currency exchange rate at the time of the study. Consumers also have a slightly significant preference for Breeding Farm and Family Farm certification, but the WTP value for this last one is not significant. The WTP for Breeding Farm certification is AR$ 37.07 per kilo – or roughly US$ 1.8 per pound. It is worth noting that these results are upper bounds, i.e., maximum amounts of money that consumers would be willing to spend for each attribute.

[5] We focus on preference space results because the RPL model in WTP space did not converge.
[6] In this analysis, the WTP calculation is multiplied by two due to our use of effects coding (Lusk et al., 2003)

Table 18: Parameter estimates from RPL model for beef steak attributes

	Mean Parameter Estimates	Standard Deviation Estimates	WTP
Price	-0.084 (0.012)***		
Organic Label			
Yes	2.366 (0.654)***	3.079 (0.518)***	57.66 [25.23, 98.59]
Origin			
BA	2.401 (0.919)***	1.804 (0.732)**	58.63 [13.70, 113.77]
SL	0.837 (0.765)	1.156 (0.782)	20.59 [-16.41, 59.77]
Uruguay	-0.424 (0.719)	4.521 (0.527)***	-9.40 [-39.33, 29.43]
Farm Name			
Mr. C	1.334 (0.756)*	2.219 (0.748)***	32.27 [-2.60, 72.49]
C Inc.	1.291 (0.805)	2.635 (0.677)***	31.71 [-4.38, 76.40]
C Breeders Inc.	1.501 (0.779)*	3.282 (0.699)***	37.07 [1.40, 88.76]
Opt Out	-18.361 (2.762)***	10.964 (1.828)***	
Log Likelihood	-983.4		

*** Denotes significance at the .01 level, ** Denotes significance at the .05 level, * Denotes significance at the .1 level

Estimated using NLogit 4.0. Numbers presented in parenthesis are standard errors. WTP in AR$. 1 AR$ = 0.1 US$

Values in brackets correspond to a 95% confidence interval built using the Krinsky-Robb parametric bootstrapping method.

The parameters in this model were also found to be correlated (Tables 19 and 20), so a specification with correlated parameters was used. This is also justified in this case by a high improvement of the log likelihood at convergence - the log likelihood for the model with correlated parameters can be verified on Table 18 and the one for the model that didn't allow for correlated coefficients is on Table 17. These results imply that consumers who value an organic label are uninterested in any of the other attributes. In addition, consumers that value the Buenos Aires origin label also value the San Luis one but none of the other labels we presented them with. Consumers that are motivated by the San Luis label are also interested in the Uruguay one,

and in the family and incorporated farm certification, but not in certification on breeding farm origin.

Table 19: Cholesky matrix for beef steak coefficients

	Organic Label	**Origin**			**Farm Name**		
	Yes	BA	SanL	Uruguay	Mr. C	C Inc.	C Breeders Inc.
Organic Label							
Yes	9.480						
Origin							
BA	-4.514***	3.253					
SL	-3.412***	1.325***	1.335				
Uruguay	-7.705***	5.482	2.207***	20.440			
Farm Name							
Mr. C	-4.253***	3.092	1.064***	5.006***	4.925		
C Inc.	-5.940***	4.537	1.599***	8.503	4.837*	6.944	
C Breeders Inc.	-8.075***	5.564	2.557	9.644	4.766	7.138***	10.774

*** Denotes significance at the .01 level, ** Denotes significance at the .05 level, * Denotes significance at the .1 level

Estimated using NLogit 4.0

Table 20: Correlation matrix for beef steak coefficients

	Organic Label	**Origin**			**Farm Name**		
	Yes	BA	SanL	Uruguay	Mr. C	C Inc.	C Breeders Inc.
Organic Label							
Yes	1.000						
Origin							
BA	-0.813	1.000					
SL	-0.959	0.636	1.000				
Uruguay	-0.553	0.672	0.422	1.000			
Farm Name							
Mr. C	-0.622	0.773	0.415	0.499	1.000		
C Inc.	-0.732	0.955	0.525	0.714	0.827	1.000	
C Breeders Inc.	-0.799	0.940	0.674	0.650	0.654	0.825	1.000

Estimated using NLogit 4.0

Consumers interested in Uruguay labels are also willing to pay for family farm certification. And finally consumers willing to pay for the family farm certification are willing to pay for incorporated farm information, and consumers willing to pay for an incorporated farm certification, in turn, are interested in the breeding farm certification.

We explore determinants of consumer behavior using a Seemingly Unrelated Regression (SUR) model. We find that WTP results can be explained by a number of socio-demographical and behavioral variables. We use the same explanatory variables that we had used to explain preferences for Store attributes, to analyze preferences for Beef attributes. Neighborhood has a positive correlation with the WTP for all the variables except the local (Buenos Aires) and Uruguay origin claims, and college education is negatively correlated with the WTP for all of the Beef attributes. These variables didn't explain preferences for any of the Store attributes at the 10% significance level. Age did significantly explain preferences for one of the Store attributes, but it doesn't explain preferences for Beef attributes. Beef steak consumption level is negatively correlated with the preference for San Luis beef: for every kilogram extra of beef consumed per capita in the household, there is a willingness to spend AR$ 34 less to get San Luis beef. For every extra point reported on a 1-to-5 Likert scale on the importance of the retailer as a cue for the inference of beef quality, there is a decrease in the WTP for the Organic, San Luis, Family, Incorporated (Inc.) and Breeding Farms attributes. This variable determined increases on the WTT for current and ideal butcher. This suggests that people that report using the retailer as a cue have higher WTT for certain store attributes and lower WTP for certain beef attributes. Butchers that provide budget advice have a negative correlation with the WTP for the Family and Inc Farm attributes. When analyzing the Store experiment, we found that there was a negative correlation between long-term butcher-consumer relationships with the preference for

high-variety type of stores. On this experiment, we can see that this variable resulted to have a negative correlation with all the variables except the Organic and Uruguay labels. The Trust variable, that did not explain any of the Store attributes, now is found to have a negative correlation with the WTP for the Organic, Uruguay, and Family and Inc Farm attributes. It is also worth noting that, as in the Store experiment, gender, marital status, and income did not explain consumer preferences for any of the attributes. A summary of these results can be found on Table 21.

Table 21: Determinants of beef steak attribute preference

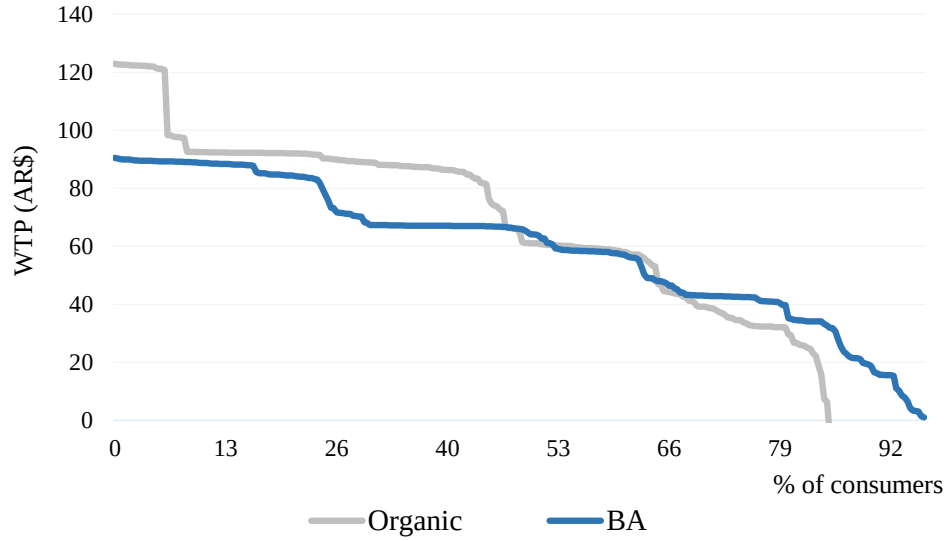
	Organic Label	**Origin**			**Farm Name**		
	Yes	BA	SanL	Uruguay	Mr. C	C Inc.	C Breeders Inc.
North	12.12**	0.09	19.35**	2.95	17.00***	19.51***	11.51***
Female	4.62	1.60	6.38	1.47	5.06	5.06	0.55
Age	-0.30	0.14	-0.94	0.00	-0.60	-1.17	0.29
Agesqr	0.00	0.00	0.01	0.00	0.01	0.01	0.00
College Ed	-15.16**	-5.89*	-37.70***	-5.57**	-16.11***	-13.37**	-8.51**
Income percap	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Married	4.84	3.11	-9.77	1.93	1.29	3.19	1.40
KBPC	-5.49	4.56	-33.74*	-0.15	-16.87	-16.54	-7.19
Retailer as Cue	-4.38*	-0.95	-8.27**	-1.32	-5.42**	-5.90**	-2.39
Known	-8.56	6.13*	-32.04***	0.04	-20.48***	-27.50***	-10.22***
Trust	-14.11**	-5.16	-12.32	-4.53**	-12.72**	-15.81**	-3.62
Price Advice	-9.35	1.37	-11.89	-1.73	-14.96**	-20.05**	-6.88
Constant	79.16***	48.88***	84.95*	22.80**	81.08***	96.32***	44.26**
Observations	305	305	305	305	305	305	305
R-squared	0.077	0.034	0.045	0.141	0.104	0.174	0.175

*** Denotes significance at the .01 level, ** Denotes significance at the .05 level, * Denotes significance at the .1 level
Estimated using Stata.

As we did with the store choice experiment, we derive demand curves for beef steak attributes. With the RPL model we saw that there were two attributes that had high (US$ 5 to 6) and significant WTP: Organic and Buenos Aires origin. Following, we focus our analysis on consumers' preference heterogeneity for these attributes.

Average willingness to pay is barely higher for the Buenos Aires (local) attribute than for the Organic attribute, according to the RPL results. However, demand can be higher for the Organic attribute than for Buenos Aires origin certification (Figure 30). The slope of the demand

Figure 30: Demand curves for selected beef steak attributes



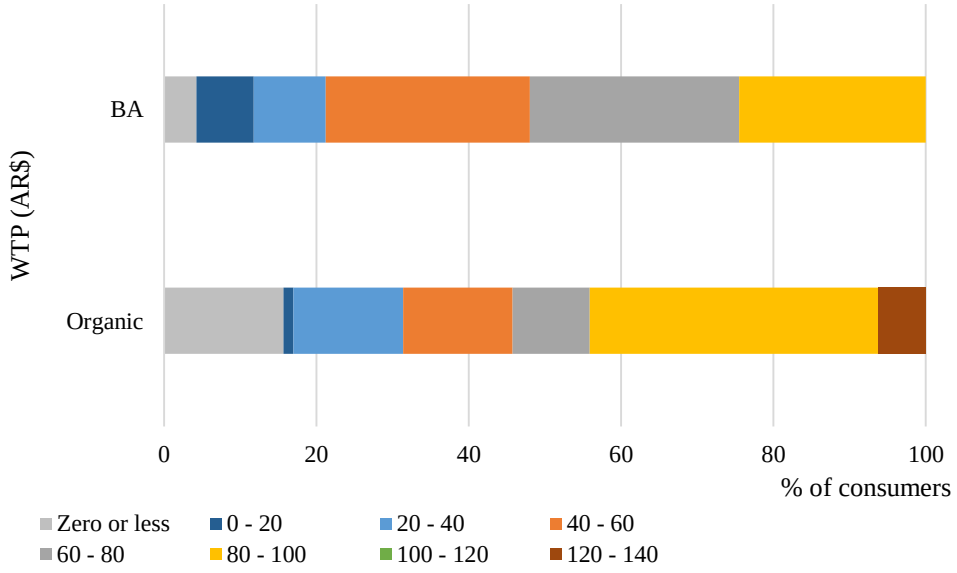
curve is more gradual for the Buenos Aires attribute than for the Organic one. This suggests that demand for Buenos Aires certification is more elastic, i.e. consumers are more responsive to changes in the price of this attribute than they are for changes in the price of the Organic attribute.

We examined which proportion of the sample displays higher and lower preferences for these attributes, following the same procedure we had followed for the store analysis. Table 22 shows the percent of consumers with WTP up to specified values, in 20 AR$ increments, for all beef steak attributes. The first column corresponds to consumers willing to spend zero AR$ or less, the second between zero and 20, and so on. Figure 30 shows these results in graphical form, only for the attributes with the highest preferences (Buenos Aires and Organic).

Table 22: Percent of consumers with up to selected WTP

WTP (AR$)	0	20	40	60	80	100	120	140	Total
Organic									
Yes	16	1	14	14	10	38		6	100
Origin									
BA	4	8	9	27	27	25			100
SL	15	27	51	6					100
Uruguay	46	3	6	19	12	8	4		100
Farm Name									
Mr. C	16	10	18	52	3				100
C Inc.	23	7	18	6	44	2			100
C Breeders Inc.	24	8	11	8	17	32			100

Figure 31: Percent of consumers with up to selected WTP for selected attributes



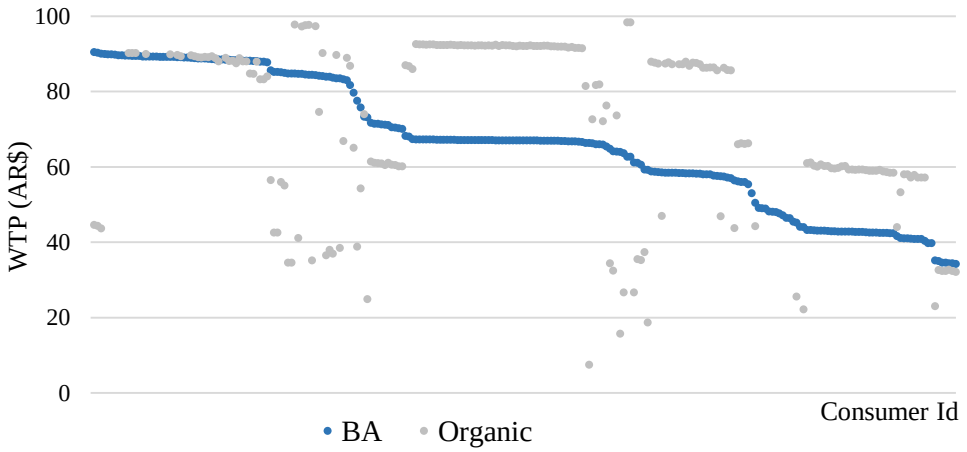
We find that 44% of customers are willing to spend large amounts of money (more than AR$ 80 – US$ 8) to get Organic certification. Only 25% of the consumers would pay those amounts for Buenos Aires certification. Below that amount, however, most consumers (74%) are

willing to pay for the Buenos Aires attribute rather than for an Organic label (25%), with exception of the "up to AR$ 40" level (i.e. WTP between AR$ 20 and AR$ 40).

These findings suggest that Buenos Aires tends to be preferred by the mainstream consumer, who may be willing to pay less; and Organic is more associated with a connoisseur-type of consumer, who may be willing to pay more. This may seem contrary to the findings obtained from the RPL model, where WTP was higher for the Buenos Aires attribute than for the Organic one. In reality, the fact that most consumers are willing to pay high amounts for Organic and most consumers are willing to pay medium amounts for Buenos Aires, doesn't tell us anything about whether there is preference heterogeneity among consumers for these attributes, or whether this heterogeneity can be significant or not.

To explore individual consumers' preferences for these two attributes, we built a graph relating consumers' individual WTP for the Buenos Aires attribute, sorted from highest to lowest – namely the demand curve for Buenos Aires certification, with each specific individual's WTP to get an Organic label (Figure 32). In this graph we can identify three groups of shoppers. First,

Figure 32: Preference for Buenos Aires and demand for organic labelling



there is a group of shoppers that have high preferences for both the Buenos Aires and the Organic attributes (the leftmost tail). On the second place, there is a group that has low preferences for both (the rightmost tail). In the center, we can see a group of customer that usually have higher preferences for the Organic attribute over the Buenos Aires one.

In order to further test the existence of homogeneity within and heterogeneity among the groups that appear to be in the graphs, we estimated a Latent Class model (Table 23). Based on model fit criterion, we determined that an adequate number of classes for our dataset was three. Based on the preference profiles, we estimate that 20% percent of the respondents are more likely to be "Not Interested" in any of the Beef attributes. Another 20% of the consumers are "Origin Conscious", they are willing to pay only for national origin certification: almost AR$ 170 for the Buenos Aires one and AR$ 62 for the San Luis one. Sixty percent of the consumers are "Top Tier" consumers. These individuals are willing to pay for all of the attributes, except for Uruguay origin certification. However, the WTP for the Buenos Aires and San Luis labels are lower for this group than for "Origin Conscious" customers. "Origin Conscious" customers are more likely to live in the south of the city, to have College-level education, to report using the retailer as a cue to infer beef quality, and to report choosing a butcher that they trust and they have known for a long time. These results are upper bounds, i.e., maximum amounts of money that consumers in each group would be willing to spend for each attribute.

The demand curves for selected attributes (Organic and Buenos Aires origin) for the three groups of customers are shown on Figure 33. "Not Interested" consumers have comparable demand for these attributes. "Origin Conscious" consumers have higher WTP for the Buenos Aires attribute than for Organic, and this is the case especially at lower premium levels.

Table 23: Latent classes for beef steak preferences

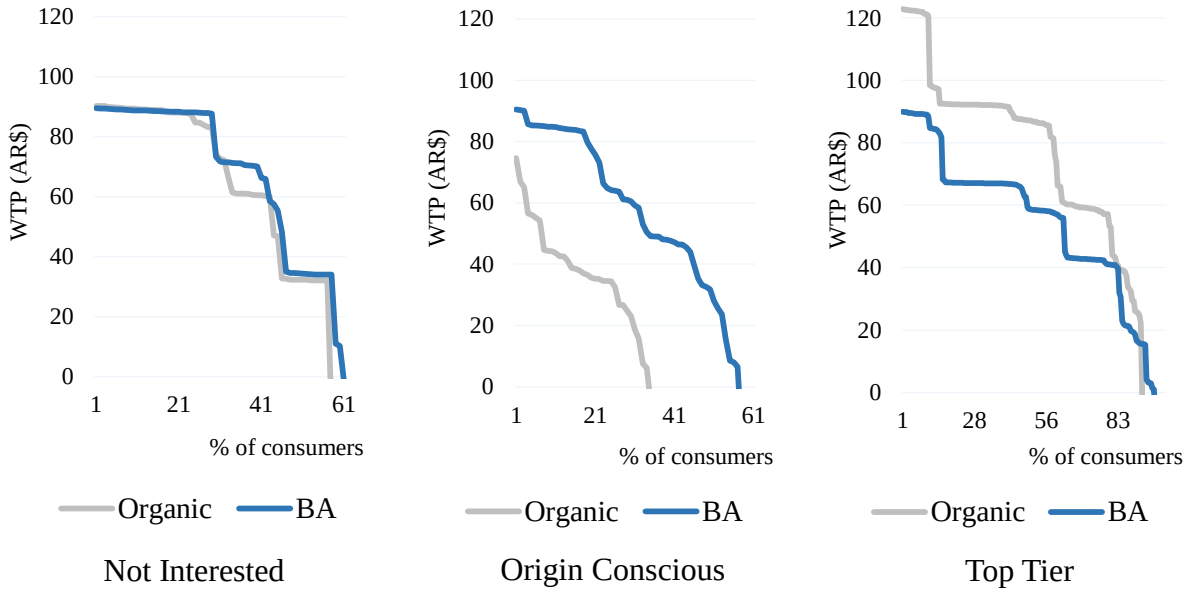
	Class 1: Not Interested		**Class 2: Origin Conscious**		**Class 3: Top Tier**	
	Parameter Estimates	WTP	Parameter Estimates	WTP	Parameter Estimates	WTP
Price	0.096 (0.062)		-0.024 (0.008)***		-0.037 (0.005)***	
Organic Label						
Yes	4.331 (2.009)**	-106.39 [-384.57, 40.15]	0.110 (0.231)	25.81 [-17.48, 136.34]	0.744 (0.163)***	42.55 [18.93, 74.62]
Origin						
BA	4.333 (2.163)**	-104.16 [-364.62, 31.87]	1.464 (0.270)***	168.61 [52.95, 482.04]	1.396 (0.328)***	79.07 [36.49, 137.94]
SL	1.816 (1.075)*	-47.05 [-178.38, 11.64]	0.526 (0.181)***	61.71 [10.75, 198.85]	1.050 (0.260)***	59.09 [28.31, 102.61]
Uruguay	0.877 (2.022)	10.75 [-253.59, 407.66]	-0.389 (0.356)	-21.32 [-59.24, 69.37]	0.344 (0.248)	21.07 [-7.13, 58.77]
Farm Name						
Mr. C	3.201 (1.569)**	-81.27 [-329.73, 48.80]	0.095 (0.175)	18.47 [-15.94, 85.86]	0.724 (0.244)***	41.04 [14.02, 77.22]
C Inc.	4.269 (2.164)**	-100.82 [-375.94, 18.50]	-0.630 (0.291)**	-49.04 [-76.58, -16.47]	0.688 (0.258)***	39.74 [10.53, 82.48]
C Breeders Inc.	5.279 (2.979)*	-117.30 [-280.92, -39.82]	-0.155 (0.381)	7.81 [-46.01, 148.49]	0.749 (0.289)***	43.74 [8.27, 93.94]
Opt Out	-1.681 (1.699)		-2.370 (0.381)***		-10.545 (0.760)***	
Class Membership Covariates						
North	-0.379 (0.339)		-0.921 (0.354)***			
Coll Ed	1.120 (0.355)***		1.004 (0.352)***			
Known	0.482 (0.387)		1.091 (0.366)***			
Trust	0.604 (0.360)*		1.040 (0.397)***			
Retailer as Cue	0.237 (0.163)		0.350 (0.170)**			
Class Prob	0.200		0.206		0.594	
Log Likelihood	-1047.383					

*** Denotes significance at the .01 level, ** Denotes significance at the .05 level, * Denotes significance at the .1 level

Estimated using NLogit 4.0. Numbers presented in parenthesis are standard errors. WTP in AR$. 1 AR$ = 0.1 US$

Values in brackets correspond to a 95% confidence interval built using the Krinsky-Robb parametric bootstrapping method

Figure 33: Demand curves for not interested, origin conscious and top tier customers



"Top Tier" consumers have higher demand for the Organic attribute, especially at higher premium levels. It is worth noting that for both of these two groups, demand for an Organic label is less elastic than for the Buenos Aires label, namely consumers in both groups are less responsive to changes in the price of an Organic label than they are to changes in the price of a Buenos Aires label.

To sum up, the general consumer population is mainly willing to pay for two attributes: Organic certification and Buenos Aires origin. Twenty percent of the consumers are not willing to pay for any of these attributes. Twenty percent are only willing to pay for Buenos Aires certification. This group relies on the seller to suggest product quality. Sixty percent of the consumers have highest preferences for the Buenos Aires attribute as well, but they are also willing to pay for all the attributes that we presented them with, except Uruguay origin certification. There is evidence that for this group of consumers' reliability in the seller is not

important. These results suggest a possible interaction between preferences for certain type of seller and certain beef attributes.

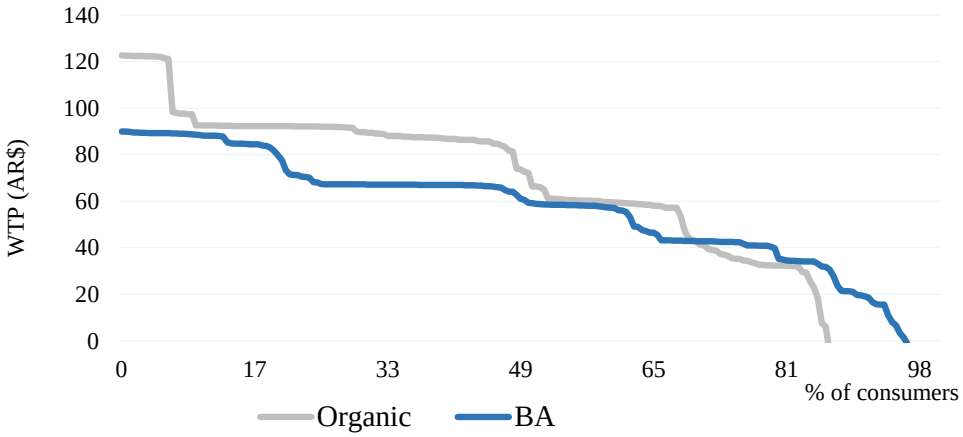
7.3 Relationship between Store and Beef Product attributes

Our third supporting objective was to uncover relationships between store choice and product choice. In the next pages we explore those relationships by comparing the results from the previous sections, and applying econometric analysis.

In both the Store and the Beef Steak choice experiments, we found that certain characteristics from the person that sells beef shape consumers' preferences. There is one characteristic in particular, that seems to form preferences for both beef retailer and beef steak attributes. This is the time the consumer and the retailer have known each other for. A seller that has known his clients for a long time, was found to be associated with a type of consumer that chooses to spend long periods of time to purchase from their habitual retailer. This type of consumer was 33% of the sample. Similarly, on the beef steak choice experiment, we found that long-term relationships between the retailer and the client were related to two types of consumers. On the first place, consumers that are not interested in paying for any of the product labels we presented them with; and on the second, consumers that are only willing to pay for national origin labels (40% of the sample, in total). The lack of a relationship with the seller, on the other hand, is related to a type of consumer that does not use the retailer as a cue to infer product quality, that prioritizes speed when making a purchase, and that's willing to pay for every beef steak attribute we offered them (except Uruguay origin).

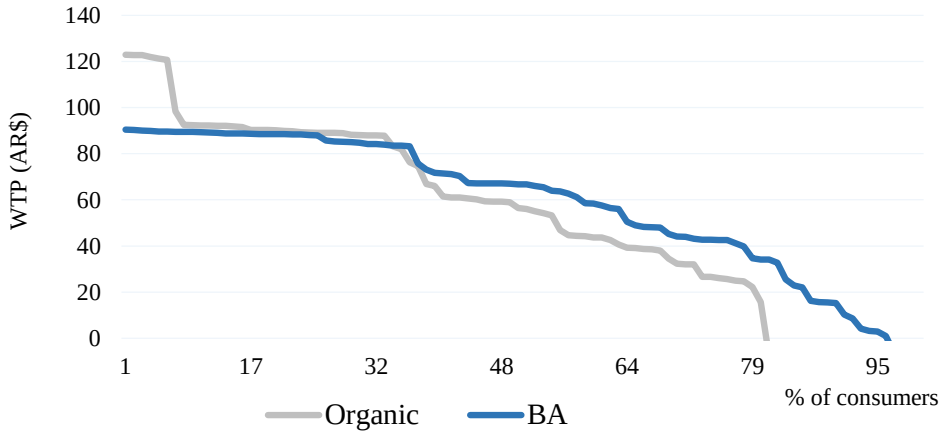
The results described above suggest that the relationship with the seller may bring a sense of confidence in the attributes of the product, substituting in some way the assurance that labels convey. We first approach the question of whether that is the case or not, by making some chart analysis. Figure 34 shows demand curves for the two most preferred beef steak attributes, for the group of consumers classified as convenience oriented. Figure 35 shows the same demand curves for consumers classified as service oriented. These charts show that there is a difference in the

Figure 34: Demand curves for selected beef steak attributes for convenience oriented customers



Convenience Oriented

Figure 35: Demand curves for selected beef steak attributes for service oriented customers



Service Oriented

intersection point between the two demand curves for these two types of consumers. For convenience oriented consumers, the demand curve for the organic attribute is on top of the demand curve for the Buenos Aires attribute for approximately 70% of the consumers. For service oriented customers, demand for the organic attribute is higher than for the Buenos Aires attribute only for 32% of the consumers.

So, the question that arises then is, what percentage of consumers are willing to pay certain amounts of money for these attributes? Are there any differences between groups? To try to answer these questions, we divided consumers' WTP results in groups, depending on how much they were willing to spend for various beef steak attributes. We did this for each of the two store preference groups. Table 24 shows the percent of consumers with WTP up to specified values, in 20 minute increments, for all beef steak attributes, for convenience oriented customers. The first column corresponds to consumers willing to spend zero AR$ or less, the second between zero and 20, and so on. Table 25 shows the same for service oriented customers.

Table 24: Percent of convenience oriented consumers with up to selected WTP

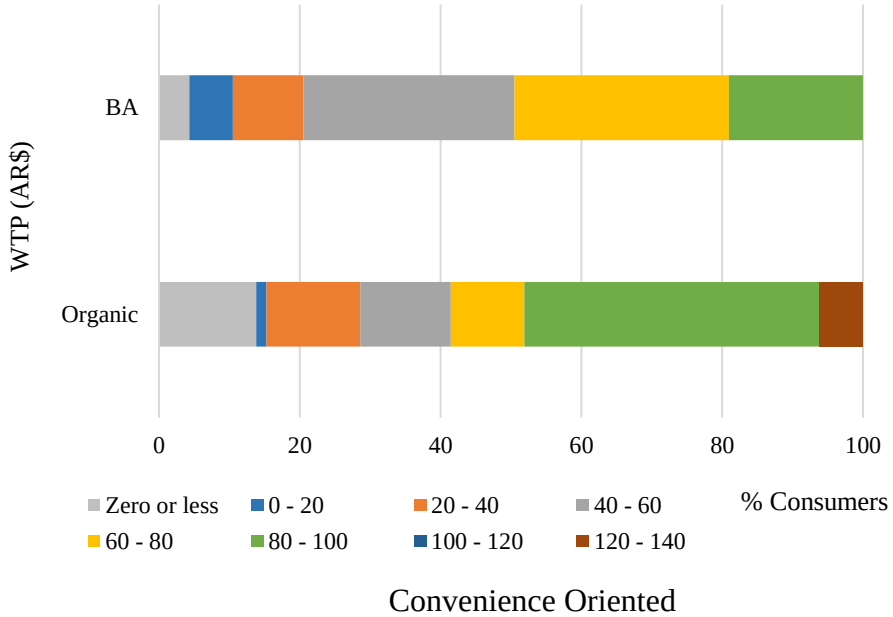
WTP (AR$)	0	20	40	60	80	100	120	140	Total
Organic									
Yes	14	1	13	13	10	42		6	100
Origin									
BA	4	6	10	30	30	19			100
SL	13	29	52	6					100
Uruguay	40	2	6	22	13	11	5	1	100
Farm Name									
Mr. C	14	8	18	55	3	1			100
C Inc.	19	6	16	6	53	1			100
C Breeders Inc.	18	9	8	9	20	37			100

Table 25: Percent of service oriented consumers with up to selected WTP

WTP (AR$)	0	20	40	60	80	100	120	140	Total
Organic									
Yes	20	1	17	18	9	29		6	100
Origin									
BA	4	10	8	20	21	36			100
SL	20	24	50	6					100
Uruguay	59	6	6	11	11	3	2		100
Farm Name									
Mr. C	19	15	18	45	4				100
C Inc.	33	10	22	6	25	3			100
C Breeders Inc.	38	7	20	4	10	20	1		100

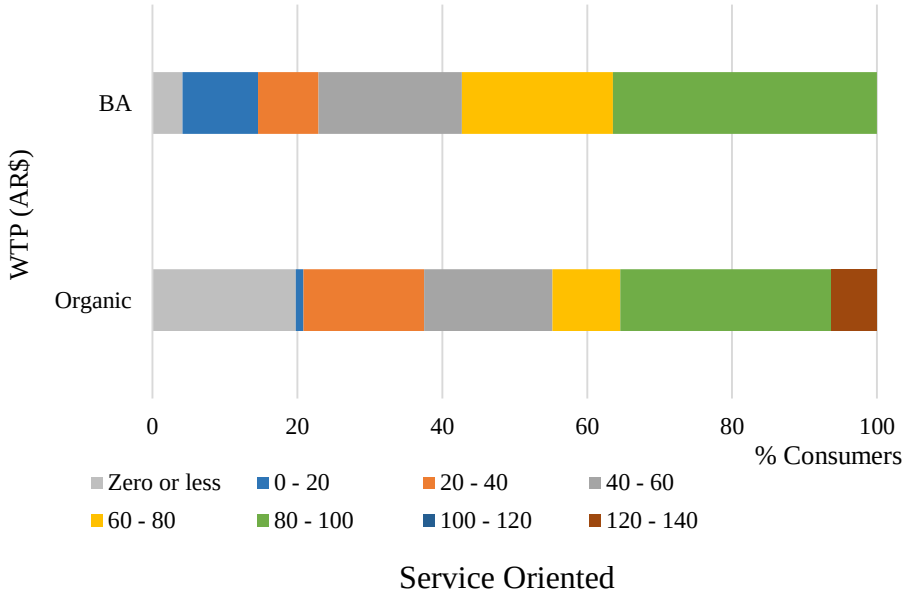
In order to interpret the distribution of these groups we elaborated two graphs, one for each group of consumers, only for the attributes with the highest preferences (Buenos Aires and Organic). Figure 36 shows these results for convenience oriented customers and Figure 37 for service oriented customers.

Figure 36: Percent of convenience oriented consumers with up to selected WTP for selected attributes



Convenience Oriented

Figure 37: Percent of service oriented consumers with up to selected WTP for selected attributes



Service Oriented

These graphs reinforce the idea that convenience oriented customers are more geared towards the organic attribute, as compared to service oriented customers. Forty two percent of the customers in this group would pay between AR$ 80 and 100 for this attribute, while only 29% of the service oriented consumer would. Conversely, 36% of the service oriented customers are willing to pay for the Buenos Aires attribute, while only 19% of the convenience oriented customers are willing to pay this amount for this attribute.

To finish our graphical analysis, we explored individual consumers' preferences for these two attributes. We did this by building a graph relating consumers' individual WTP for the Buenos Aires attribute, sorted from highest to lowest – namely the demand curve for Buenos Aires certification, with each specific individual's WTP to get an Organic label (Figures 38 and 39). Once again, by comparing these charts, we can see that most individuals in the convenience oriented group have higher preferences for the organic attribute than for the Buenos Aires attribute, while for service oriented customers there's not such a clear trend.

Figure 38: Convenience oriented customers' preferences for Buenos Aires and demand for organic labelling

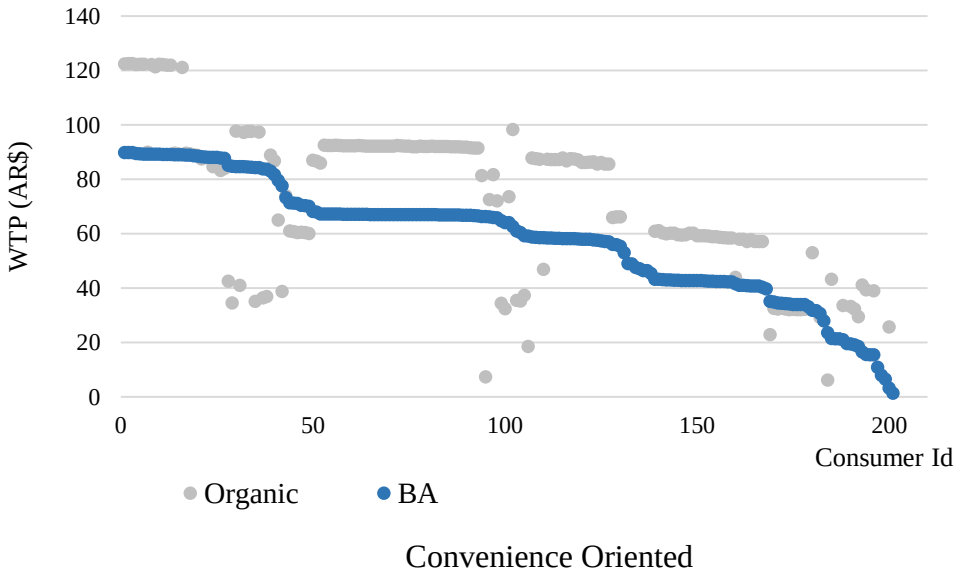
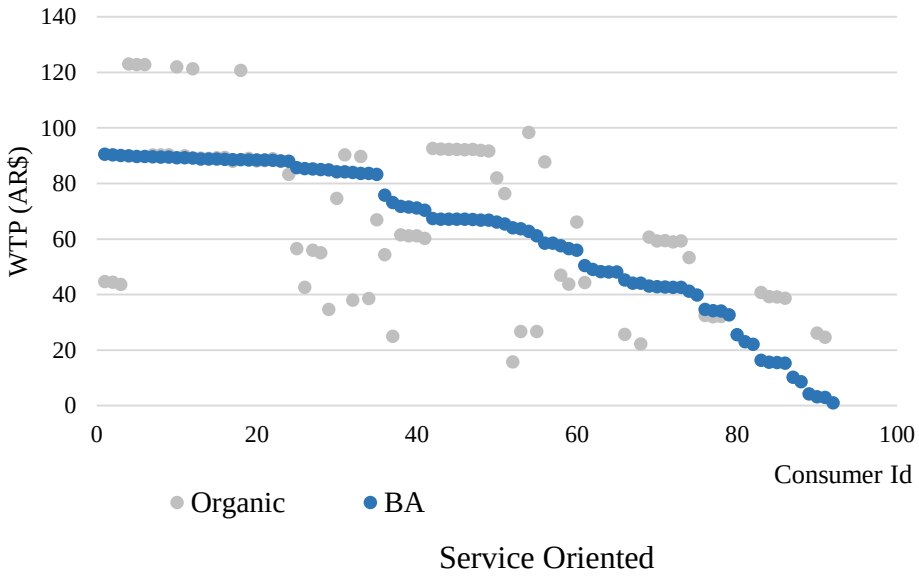


Figure 39: Service oriented customers' preferences for Buenos Aires and demand for organic labelling



To test this idea econometrically, we estimate preferences for Beef Steak attributes for the two classes of consumers we had found with respect to store preferences (Convenience and

Service Oriented customers). Preferences for Beef Steak attributes for these groups were estimated using a RPL model allowing for correlated parameters. The results from these models are presented on Tables 26 and 27. We find that Convenience Oriented customers are willing to

Table 26: Parameter estimates from RPL for convenience oriented customers on beef steak attributes

	Mean Parameter Estimates	Standard Deviation Estimates	WTP
Price	-0.096 (0.018)***		
Organic Label			
Yes	2.400 (1.069)**	3.763 (1.013)***	52.57 [8.07, 110.77]
Origin			
BA	-1.336 (2.521)	4.188 (1.912)**	-29.23 [-149.21, 75.18]
SL	-2.692 (2.310)	3.274 (1.971)*	-59.55 [-178.63, 38.13]
Uruguay	0.614 (1.292)	5.916 (1.243)***	15.56 [-33.54, 80.26]
Farm Name			
Mr. C	1.602 (2.185)	2.468 (2.167)	38.78 [-52.95, 142.03]
C Inc.	1.470 (2.225)	2.626 (2.167)	36.36 [-54.64, 143.24]
C Breeders Inc.	1.956 (1.442)	4.079 (1.606)**	44.39 [-14.02, 121.21]
Opt Out	-21.682 (5.768)***	13.039 (3.590)***	
Log Likelihood	-616.485		

*** Denotes significance at the .01 level, ** Denotes significance at the .05 level, * Denotes significance at the .1 level
Estimated using NLogit 4.0. Numbers presented in parenthesis are standard errors. WTP in AR$. 1 AR$ = 0.1 US$
Values in brackets correspond to a 95% confidence interval built using the Krinsky-Robb parametric bootstrapping method.

pay for the Organic attribute, and that Service Oriented customers are not willing to pay significantly for any of the attributes. These findings indicate that consumers who are willing to spend time to purchase from a trusted retailer are not willing to pay for any product labeling, whereas people that choose to save time on their purchases and not interact with a real person, respond to product labeling and are willing to pay for Organic certification. Convenience

oriented consumers' willingness to pay for the organic attribute is AR$ 52.57 per kilo (US$ 2.40 per pound).

Table 27: Parameter estimates from RPL for service oriented customers on beef steak attributes

	Mean Parameter Estimates	Standard Deviation Estimates	WTP
Price	-0.063 (0.035)*		
Organic Label			
Yes	4.477 (4.239)	2.591 (2.727)	0.58 [-0.47, 1.13]
Origin			
BA	7.158 (6.746)	4.533 (6.306)	0.52 [-0.75, 1.30]
SL	2.341 (4.081)	1.666 (3.782)	0.18 [-0.70, 0.85]
Uruguay	0.425 (3.247)	5.185 (4.098)	0.19 [-0.55, 0.80]
Farm Name			
Mr. C	2.978 (3.913)	3.962 (4.229)	0.35 [-0.58, 0.93]
C Inc.	3.481 (4.511)	5.776 (5.549)	0.39 [-0.60, 1.17]
C Breeders Inc.	3.118 (4.730)	4.131 (3.837)	0.41 [-0.70, 1.03]
Opt Out	-21.546 (17.341)	12.805 (8.196)	
Log Likelihood	-318.149		

*** Denotes significance at the .01 level, ** Denotes significance at the .05 level, * Denotes significance at the .1 level
Estimated using NLogit 4.0. Numbers presented in parenthesis are standard errors. WTP in AR$. 1 AR$ = 0.1 US$
Values in brackets correspond to a 95% confidence interval built using the Krinsky-Robb parametric bootstrapping method.

Table 26 shows that convenience oriented consumers' preferences are heterogeneous for most of the beef steak attributes. On the other hand, Table 27 shows that service oriented consumers' preferences for beef steak attributes are homogeneous. This can be interpreted as that 33% of the consumers have consistent preferences for both retailer and beef steak attributes: they look for a butcher and for variety from the retailer, and they are not willing to pay for any of the beef steak attributes.

Finally, we back up the econometric analysis with a robustness check. On the previous sections, we segmented our sample in two groups first, according to store preferences (Service and Convenience Oriented Customers), and in three groups second, according to preferences for beef steak attributes (Not Interested, Origin Conscious, and Top Tier). Service oriented customers were 33% of the sample and convenience oriented customers were 67%. Not interested customers were 20%, origin conscious another 20%, and top tier customers were 40%.

In order to find out if the probability of belonging to these groups was correlated we calculated correlation coefficients and found out their significance using Spearman's method (Table 28). Even though the correlations are weak, these results confirm that not interested and origin conscious consumers are more likely to be service oriented, and that top tier consumers are more likely to be looking for convenience.

Table 28: Spearman correlation matrix for the six selected sub-classes

	Store Class	
	Convenience	Service
Beef Class		
Not Interested	-0.107*	0.107*
Origin Conscious	-0.241***	0.241***
Top Tier	0.226***	-0.226***

This means that 60% of the consumers are likely to have a higher demand for convenience from their retailers and Organic certification from producers. Likewise, 40% of the consumers are more likely to have a higher demand for their Current Butcher and to have higher preferences for Local certification than for Organic certification.

To sum up, our findings confirm that consumers that trust their seller are willing to spend a great deal of time to buy from them, but they are not willing to pay for any of the attributes we

tested. Consumers that are willing to save time on their purchase, are willing to spend money for Organic labeling on their beef steak product instead. This indicates that indeed, there is a substitution effect between the WTT for retailer attributes and the WTP for beef steak attributes, suggesting that the utility that consumers derive from the retailer and the utility that they derive from the product, are interrelated.

8. IMPLICATIONS

In this chapter we will make a summary of the main findings, and derive conclusions relevant to the Argentinean beef value chain. Finally, we suggest future research opportunities.

8.1 Summary of Findings

Consumers in our sample were found to have preferences and demand for certain retailer and beef attributes. With respect to preferences for store attributes, high beef product variety was found to be more highly preferred on average than a butcher. The average consumer prefers his current butcher. Consumers are willing to spend between half an hour and 45 minutes to get high beef product variety and a known butcher. The size of a business, as measured by number of employees, is not a significant driver of store patronage. Sixty-seven percent of the consumers are looking for convenience on their purchases, and 33% of them are looking for the advice from a trusted butcher. With regards to the preferences for beef attributes, consumers have high WTP for a local label and for organic certification, between AR$ 55 and 60, and slightly significant preferences for a breeding type of farm. Twenty percent of consumers are not willing to pay for any of the beef attributes, and another twenty percent are only willing to pay only for national origin certification labels. Sixty percent of the customers are willing to pay for origin, organic, and farm level information. We find preferences for store attributes and for beef products to be substitutes of each other: consumers who have high willingness to spend time to reach their trusted butcher are willing to pay nothing for the beef steak attributes we examined. Consumers that lack trust in their current seller and prioritize saving time when making a purchase, are

willing to pay for an organic certification label. This substitution is determined by the attributes of a customers' current seller – being reliable, building a relationship and giving advice: consumers that spend time to get to their store of preference and that don't want to pay for certification labels, report trusting their butcher. Consumers that save time on their purchase but are willing to pay for certification labels report that their current beef seller is not reliable.

8.2 Conclusions

Based on these results, we can derive some food policy, agribusiness and marketing implications. First, organic certified producers should sell their product through stores that have more employees and that offer higher convenience and variety. Producers from Argentina should label their products independently from the retail channel they use, and producers from Uruguay may want to not inform consumers of the origin of their products. All the farms that have a brand, whether they are breeding, family or incorporated farms, should market their products through stores with many employees. Producers that do not or cannot certify their products as being organic or as coming from a specific place or farm, should sell them through channels in which trust can substitute for this the label. Our research suggests that consumers will disregard those labels if they are purchasing from somebody they know. Stores may want to focus on offering beef product variety and reliability, but if they have to focus on one of the two, they should go for variety, as there is a larger market share for that attribute. Variety-focused stores should try to offer products with organic labels, and service-focused stores should emphasize attention as their marketing strategy. Urban planners, value chain logistics specialists and opening stores should take into account that for stores in the North consumers are more likely to demand speedy service, high variety and product labeling, whereas stores in the south,

consumers are more likely to demand a known butcher, high variety and origin certification. And finally taxing agencies should take into account - among other factors - the fact that organic and Buenos Aires farms, and high variety and customer service stores are more likely to earn higher revenues. This is the case especially for stores that offer the combination of high convenience and labeled beef products. Faiguenbaum et al. (2002) state that in sectors such as meat, where the traditional retailers still control a significant market share, a public objective should be to support their continuation as viable and efficient enterprises. They base this statement on the claim that this leads to more inter-firm competition and direct employment. They suggest a few ways of implementing this, such as opening up access to financial markets and improving the infrastructure and services of traditional markets such as local fairs.

8.3 Future Research

These results are only applicable to the context and time of this study, and should be read as a result of the history and traits of the Argentinean beef value chain. Also, this survey was conducted at many different kinds of beef purchase locations, from big supermarkets to butcher shops, including minimarkets, Chinese markets and mini supermarkets. These results should be interpreted as representative of people buying beef from these types of stores in general. We are aware that there may be differences between the preferences of the clients of different types of stores. This will be an interesting area of future research. It would also be relevant to interview people in smaller cities in this country. Finally, another interesting area of future research would be to assess these attributes using revealed preference data, wherever possible.

APPENDICES

Appendix A: Meat price and consumption data for the Meat Demand Analysis

year	Bov_qtty	Pork_qtty	Poultry_ qtty	Bov_Price	Pork_Pric e	Poultry_ Price	Cons_ Price_Indx
1992	65.1	5.5	16.1	894.4	1049.8	974.1	0.38
1993	64.8	7.6	22.5	773.8	921.0	1011.1	0.42
1994	61.5	7.9	23.5	754.7	961.0	986.0	0.42
1995	56.0	6.9	23.9	763.2	970.2	960.2	0.43
1996	54.5	6.6	23.0	812.3	1100.4	1010.3	0.43
1997	56.2	6.1	23.9	910.5	1190.6	890.4	0.43
1998	56.3	7.2	27.0	1056.5	1020.5	783.4	0.44
1999	60.3	8.0	28.0	794.4	760.4	680.3	0.42
2000	59.1	8.0	27.8	868.4	780.4	680.3	0.41
2001	56.8	7.3	26.8	766.4	800.4	670.3	0.4
2002	52.9	4.8	19.0	496.2	509.3	378.7	0.54
2003	55.4	5.1	19.7	655.7	758.5	920.5	0.65
2004	56.5	5.1	22.0	654.2	734.3	807.3	0.68
2005	56.0	5.4	24.4	761.6	754.0	705.8	0.75
2006	55.6	6.6	27.8	703.3	747.4	569.2	0.84
2007	55.1	7.0	29.0	732.6	846.4	715.7	0.94
2008	54.7	7.8	31.6	818.3	1012.0	755.6	1
2009	54.6	8.2	33.5	740.9	844.9	638.9	1.03
2010	54.7	8.3	34.6	1474.9	1222.5	965.8	1.17
2011	54.9	9.0	35.3	1884.9	1384.4	1088.2	1.29

Appendix B: Code for the Meat Demand Analysis

```
/*

LA/AIDS Model
Florencia Manón Colella
May 2015

*/


*getting stata ready
clear all
set memory 200m
set more off
capture log close
log using "C:\Users\FlorenciaManon\OneDrive\AEC 835\Assignments\Paper\Stata
Files\Untitled",replace
cd "C:\Users\FlorenciaManon\OneDrive\AEC 835\Assignments\Paper\Stata Files"
use "Data.dta", clear
keep  year bov_qtty pork_qtty poultry_qtty bov_price pork_price poultry_price
cons_price_indx


/*
Converting nominal prices to real numbers
*/
gen rpbov = bov_price/cons_price_indx
gen rppork = pork_price/cons_price_indx
gen rpchck = poultry_price/cons_price_indx

/*
Generating mean real prices
*/
su rpbov
display _result(3)
gen rpbovbar=_result(3)
su rppork
gen rpporkbar=_result(3)
su rpchck
gen rpchckbar=_result(3)

/*
Calculating expenditure and ln expenditure
*/
gen y = rpbov*bov_qtty+rppork*pork_qtty+rpchck*poultry_qtty
gen lny = ln(y)

/*
Calculating Expenditure Shares
*/
gen bes = rpbov*bov_qtty/y
gen pes = rppork*pork_qtty/y
gen ces = rpchck*poultry_qtty/y
```

```
/*
Scaling Prices by their mean
*/
gen srpb= rpbov/rpbovbar
gen srpp= rppork/rpporkbar
gen srpc= rpchck/rpchckbar

/*
Calculating ln of real SCALED prices
*/
gen lnsrpb= ln(srpb)
gen lnsrpp= ln(srpp)
gen lnsrpc= ln(srpc)

/*
Generating lag variables for ln of real prices, log expenditure and
shares
*/
gen dlnsrpb= lnsrpb-lnsrpb[_n-1]
gen dlnsrpp= lnsrpp-lnsrpp[_n-1]
gen dlnsrpc= lnsrpc-lnsrpc[_n-1]
gen dlny= lny-lny[_n-1]
gen dbes = bes-bes[_n-1]
gen dpes = pes-pes[_n-1]
gen dces = ces-ces[_n-1]

/*
Generating price index and adjusted income
*/
gen dlnrb = bes*dlnsrpb+pes*dlnsrpp+ces*dlnsrpc
gen dy = dlny-dlnrb

/*
Model With Restrictions
*/
*Listing Symmetry Homogeneity and Addition Constraints for Beef and Pork
constraint define 1 [beef]dlnsrpp = [pork]dlnsrpb
constraint define 2 [beef]dlnsrpb + [beef]dlnsrpp + [beef]dlnsrpc = 0
constraint define 3 [pork]dlnsrpb + [pork]dlnsrpp + [pork]dlnsrpc = 0

*Running Seemingly Unrelated Regression for this Model
sureg(beef: dbes = dlnsrpb dlnsrpp dlnsrpc dy)(pork: dpes = dlnsrpb dlnsrpp
dlnsrpc dy), isure constraint (1 2 3)

*Listing Symmetry Homogeneity and Addition Constraints for Beef and Chicken
constraint define 1 [beef]dlnsrpc = [chicken]dlnsrpb
constraint define 2 [beef]dlnsrpb + [beef]dlnsrpp + [beef]dlnsrpc = 0
constraint define 3 [chicken]dlnsrpb + [chicken]dlnsrpp + [chicken]dlnsrpc =
0

*Running Seemingly Unrelated Regression for this Model
sureg(beef: dbes = dlnsrpb dlnsrpp dlnsrpc dy)(chicken: dces = dlnsrpb
dlnsrpp dlnsrpc dy), isure constraint (1 2 3)

save "Data.dta",replace
```

Appendix C: Questionnaire, Spanish version

Encuestador: Fecha:

Dirección: Tipo de negocio: a b c d e f

Hora:

1. Cuántas veces al mes compra Ud. alimentos?

1or - 2 3 4 5 6 7 8 9 10 11 12 13o+

2. Cuánto gasta Ud. en promedio cada vez que compra alimentos?

3. Cuántas veces al mes compra Ud. carne en estos comercios, y cuánto gasta en promedio cada vez?

	1o-	2	3	4	5	6	7	8	9	10	11	12	13o+	Gasto
a. Carnicería														
b. Supermercado														
c. Mini Mercado														
d. Super Express														
e. Super Chino														
f. Feria Barrial														

Definiciones: Carnicería si sólo vende carnes. Supermercado vende de todo y tiene más de 15 empleados en más de 2 sucursales. Mini mercado vende más que sólo carne pero no tiene la variedad del super (solo verdura, o verdura + vendedor de ramos grales nacional), y tiene una sola sucursal y menos de 15 empleados. Super Express es la versión mini del supermercado, muchas sucursales y muchos empleados (hard discounts como Día entran acá). Super chino es como el mini mercado con la única diferencia de que el vendedor de ramos generales es chino. Feria barrial son las del GCBA, o el Mercado Central.

4. Cuáles de las siguientes características posee su actual principal proveedor de carne?

a.	Lo conozco desde hace mucho tiempo	f.	Me deja decidir sin interferir	j.	Me reserva los cortes que me gustan
b.	Me da consejos sobre la relación precio/calidad	g.	Corta la carne justo como le pido	k.	Remueve toda la grasa de mis cortes de carne
c.	Me da consejos de cocción	h.	Es amigable	l.	Es confiable
d.	No está legalmente registrado	i.	Es un simple despachante	m.	Tiene precios muy altos
e.	Tiene buenos precios				

5. En una Escala de 1 a 5, qué nivel de importancia le asignaría a las características del comercio en su percepción de la calidad de la carne?

No importante 1 2 3 4 5 Muy importante

6. En una Escala de 1 a 5, qué nivel de importancia le asignaría a las prácticas de producción de la carne, si las

pudiera conocer, en su percepción de la calidad de ésta?

No importante 1 2 3 4 5 Muy importante

7. Cuánta gente vive en su casa, incluyendo a usted?:

8. Cuánta gente de menos de 18 años vive en su casa?:

9. Cuánta gente de más de 60 años vive en su casa?:

10. Cuantos kilos de carne consume su familia en una semana en la casa?

a. < 0,250 c. 0,500 – 2 e. 5 – 10

b. 0,250 - 0,500 d. 2 – 5 f. > 10

11. Cuantos kilos de bife de chorizo de novillito consume su familia en una semana en la casa?

a. < 0,250 c. 0,500 – 2 e. 5 – 10

b. 0,250 – 0,500 d. 2 – 5 f. > 10

12. Sexo a. Masculino b. Femenino c. Otro d. NC

13. Edad:

a. < 20 d. 30 - 34 g. 45 - 49 j. 60 -64 m. 75 - 79

b. 20 - 24 e. 35 – 39 h. 50 - 54 k. 65 - 69 n. 80 - 84

c. 25 - 29 f. 40 - 44 i. 55 - 59 l. 70 - 74 o. >=85

14. Máximo nivel educativo alcanzado (finalizado)

a. Primario b. Secundario c. Grado d. Posgrado

15. Ingresos promedio mensuales de la casa

a. < $ 5.000 c. $ 10.000 – 14.999 e. $ 20.000 – 24.999

b. $ 5.000 – 9.999 d. $ 15.000 – 19.999 f. >= $25.000

16. Cómo describiría su estado civil?

a. Casado o cohabitando b. Soltero c. Viudo d. Divorciado e. Otro

17. Cómo describiría su posición socio-política?

a. Izquierda c. Centro e. Derecha

b. Centro-Izquierda d. Centro-Derecha f. NC

En las próximas 6 preguntas, suponga que tiene que comprar carne. Decidirá dónde hacerlo entre dos tiendas hipotéticas, y también tendrá la opción de no comprar. Supondremos que las tiendas son exactamente iguales, salvo en algunos atributos que le explicaré a continuación (por ejemplo ambas ofrecen los mismos niveles de precios, de higiene, etc.). Cada pregunta representa un escenario de compra nuevo e independiente. Por favor trate cada escenario como si estuviera en una situación real, es decir que el tiempo que dedicaría a la compra reduciría el disponible para otras actividades.

Tamaño de la Empresa	**Pequeña** significa que la empresa tiene menos de 5 empleados en total entre todas las sucursales conocidas **Mediana** significa que la empresa tiene entre 5 y 15 empleados en total entre todas las sucursales conocidas **Grande** significa que la empresa tiene más de 15 empleados en total entre todas las sucursales conocidas
Carnicero	**Ausente** significa que no hay una persona para proveer la carne. Se puede acceder solamente a lo que está exhibido en los estantes **Nuevo** significa que es la primera vez que Ud. compraría a este proveedor. No tiene ninguna referencia acerca de él por lo que desconoce si el servicio que le dará será bueno o malo **Actual** es su actual proveedor de carne. Si nunca compra en el mismo lugar, tome aquel al que le compra más frecuentemente o el último donde haya comprado **Ideal** es el mejor proveedor que podría imaginar de acuerdo a sus propios parámetros
Variedad	**Bajo** significa que solo se encuentran bifes y carne picada **Medio** significa que se encuentran bifes, carne picada, embutidos pero no achuras **Alto** significa que se encuentran bifes, carne picada, embutidos y achuras
Tiempo	Tiempo en minutos que se dedicaría a la compra, incluyendo el viaje y la compra en sí misma. Si usted normalmente compra su carne y otros productos al mismo tiempo, por favor piense en la proporción del tiempo total que correspondería sólo a la carne. **10' | 20' | 30' | 60'**

En las próximas 6 preguntas, suponga que está en la tienda y decide comprar un kilo de bife de chorizo de novillito. Decidirá qué comprar entre dos bifes de chorizo de novillito hipotéticos, y también tendrá la opción de no comprar. Supondremos que los bifes de chorizo de novillito son exactamente iguales salvo en algunos atributos que le explicaré a continuación (por ejemplo ambos tienen el mismo sabor, terneza, frescura, etc.). Cada pregunta representa un escenario de compra nuevo e independiente. Por favor recuerde tratar éstas situaciones hipotéticas como lo haría en una situación real, es decir que el dinero que dedicaría a ésta compra reduciría el disponible para otras actividades.

Nombre del Campo	**Sin Info** significa que no hay información del campo de origen **Carnes Don Juan Vaca** es una empresa unipersonal donde el dueño es el señor Juan Vaca **Vaca S.A.** es una sociedad anónima de nombre Vaca **Cabaña y Estancia Vaca S.A.** es una sociedad anónima de nombre Cabaña y Estancia Vaca
Indicador Orgánico	Éste atributo se refiere a la presencia o ausencia de un cartel o etiqueta de producción orgánica aprobado por la Secretaría de Agricultura, Ganadería, Pesca y Alimentación. Los sistemas de producción orgánica son aquellos que preservan el ambiente, evitan el uso de químicos y tratan a los animales humanamente. **No Tiene | Tiene**
Origen	**Sin Info** significa que no hay una etiqueta o cartel que indique la localización del campo de producción **San Luis** es una provincia Argentina que se encuentra fuera de la Región Pampeana **Buenos Aires** es una provincia Argentina que se encuentra en la Región Pampeana **Uruguay** es un país vecino que se encuentra dentro de la Región Pampeana
Precio	Este es el precio en pesos que Ud. pagaría por el kilo de bife de chorizo de novillito. **$70 | $100 | $130 | $160**

Appendix D: Questionnaire, English version

Enumerator: Date:

Address: Store Type: a b c d e f

Time:

1. How many times per month do you go grocery shopping?

1or - 2 3 4 5 6 7 8 9 10 11 12 13o+

2. How much do you spend, on average, each time you go grocery shopping?

3. How many times per month do you buy meat in each of these stores and how much do you spend, on average, each time?

	1or-	2	3	4	5	6	7	8	9	10	11	12	13or+	Xpnse
a. Butcher Shop														
b. Supermarket														
c. Mini Market														
d. Express Super														
e. Chinese Super														
f. Fair														

Definitions: Butcher Shops only sell meat. Supermarkets sell all kinds of products and have more than 15 employees in more than 2 locations. Mini Market sells more than just meat but does not offer as much variety as the super (only vegetables, or vegetables and national general store), and they have only one location with less than 15 employees. Express Super is the mini version of the supermarket, with many locations and many employees (hard discounts included in this group). Chinese Super is like the mini market with the only difference that the general salesman is Chinese. Fair is a local fair, usually sponsored by the Govnmt.

4. Which of the following characteristics does your current meat provider display?

a.	I've known him for a long time	f.	He lets me decide and doesn't interfere	j.	He saves the cuts I like for me
b.	He gives me value-for-budget advice	g.	He cuts the beef just as I ask him to	k.	He removes all the separable fat from the beef cut
c.	He gives me cooking advice	h.	He's friendly	l.	He's reliable
d.	He's not legally registered	i.	He's just a dispatcher	m.	He offers high prices
e.	He offers good prices				

5. On a scale from 1 to 5, what level of importance would you assign to the characteristics of the retailer in your beef quality perception?

Not important 1 2 3 4 5 Very important

6. On a scale from 1 to 5, what level of importance would you assign to the beef production practices, if you could know them, in your beef quality perception?

Not important 1 2 3 4 5 Very important

7. How many people live in your house, including yourself?:

8. How many people younger than 18 live in your house?:

9. How many people older than 60 lives in your house?:

10. How many kilos of beef does your family consume at home in one week?

a. < 0,250 c. 0,500 – 2 e. 5 – 10

b. 0,250 - 0,500 d. 2 – 5 f. > 10

11. How many kilos of young steer's sirloin steak does your family consume at home in one week?

a. < 0,250 c. 0,500 – 2 e. 5 – 10

b. 0,250 – 0,500 d. 2 – 5 f. > 10

12. Sex a. Male b. Female c. Other d. NA

13. Age:

a. < 20 d. 30 - 34 g. 45 - 49 j. 60 -64 m. 75 - 79

b. 20 - 24 e. 35 – 39 h. 50 - 54 k. 65 - 69 n. 80 - 84

c. 25 - 29 f. 40 - 44 i. 55 - 59 l. 70 - 74 o. >=85

14. Highest education level achieved

a. Primary b. Secondary c. Undergraduate d. Graduate

15. Average monthly household Income

a. < $ 5.000 c. $ 10.000 – 14.999 e. $ 20.000 – 24.999

b. $ 5.000 – 9.999 d. $ 15.000 – 19.999 f. >= $25.000

16. How would you describe your marital status?

a. Married or cohabiting b. Single c. Widow d. Divorced e. Other

17. How would you describe your socio-political position?

a. Left c. Center e. Right

b. Center-Left d. Center-Right f. NA

In the next 6 questions, suppose that you need to purchase some beef. You will first decide where to go to do so between two hypothetical stores, and you'll also have the option of not buying. We will suppose that these stores are exactly the same except on some attributes which I'll tell you about following (for example they both offer the same prices, comparable hygiene levels, etc.). Each choice set represents a new and independent purchasing

scenario. Please treat each situation as if you were in a real purchasing decision, meaning that the time you'd devote to the purchase would reduce the one available for other activities.

Size of Firm	**Small** means that the business has less than five employees total in all known locations **Medium** means that the business has between 5 and 15 employees total in all known locations **Large** means that the business has more than 15 employees total in all known locations
Butcher	**Absent** means that there is no person to provide beef. You can just access what's displayed on the shelves **New** means that this is the first time you'd purchase from this provider. You have no reference about them so you don't know how good or bad the service they'll provide you with might be **Current** is your current beef provider. If you never shop at the same place, take the one where you go most frequently or the last one you've purchased from **Ideal** is the best beef provider you could imagine according to your own parameters
Variety	**Low** means that only beef steaks and ground beef are available **Medium** means that beef steaks, ground meat, sausages, but no offal are available **High** means that beef steaks, ground meat, sausages and offal are available
Time	Time in minutes to be spent in the purchase, including travelling time and time spent in the location. If you usually purchase more than just meat on your grocery shopping trips, please think of the proportion of the total time that you allocate to buying meat. **10' | 20' | 30' | 60'**

In the next 6 questions, suppose that you are at the store and you decide to purchase a kilo of young steer's sirloin steak. You will decide what to buy between two hypothetical young steer's sirloin steaks, and you'll also have the option of not buying. We will suppose that these young steer's sirloin steaks are exactly the same except on some attributes which I'll tell you about following (for example they both have the same taste, tenderness, freshness, etc.). Each choice set represents a new and independent purchasing scenario. Please remember to treat each situation as if you were in a real purchasing decision, meaning that the money you'd devote to this purchase would reduce the one available for other activities.

Name of Farm	**No Info** means that there's no information on the farm of origin **Carnes Don Juan Vaca** is a unipersonal Enterprise where the owner is Mr. Juan Vaca **Vaca S.A.** is a Company named Vaca **Cabaña y Estancia Vaca S.A.** is a Company named Cabaña y Estancia Vaca
Organic Claim ORGANICO ARGENTINA	This attribute refers to the presence or absence of a label or sign of Organic Production approved by the Argentine Secretary of Agriculture, Livestock, Fisheries and Foods. Organic production systems are those that preserve the environment, avoid the use of chemicals and treat animals humanely. **With | Without**
Origin	**No Info** means that there's no label or sign indicating the location of the production farm **San Luis** is an Argentine province outside of the Pampa Region **Buenos Aires** is an Argentine province that's located within the Pampa Region **Uruguay** is a neighboring country that's located within the Pampa Region
Price	This is the price in AR$ that you would pay for the kilo of young steer's sirloin steak. **$70 | $100 | $130 | $160**

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