

**Retail Channel and Beef Preferences:
Experimental Results from Consumers in Buenos Aires, Argentina**

Research Article

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Abstract

Traditionally-produced beef from Argentina is recognized and demanded internationally. Locally, consumers are often unable to afford these certified beef products, and may rely on external cues to determine beef quality. Are Argentinean consumers willing to pay for sustainably or organically produced beef? Are these consumers using alternative sources of information, other than product labels? Determining demand for beef attributes may require an understanding of consumers' product purchasing strategies, which involves retailer choice. We develop a framework utilizing latent class analysis to identify consumer groups with different retailer preferences, and separately estimate their demand for beef product attributes. This framework accounts for the interrelationship between consumers' choice of retail outlets and beef product preferences. Our analysis of data from the city of Buenos Aires identifies two groups of consumers, a convenience- (67%) and a service- (33%) oriented group. We uncover significant differences in demand for beef attributes across these groups, and find that the service oriented group, while not willing to pay for credence attributes, relies on a service-providing retailer (namely a butcher) as a source of product quality assurance. We note that failing to account for the interrelationship between retailer and product preferences can lead to biased estimation of preferences and demand for beef attributes.

Keywords: decision modeling, choice experiment, butcher, beef, Argentina

Resumen

La carne bovina Argentina producida con métodos tradicionales es reconocida internacionalmente. Localmente, sin embargo, los productos certificados son escasos o costosos. Los consumidores Argentinos posiblemente usen pistas externas al producto para determinar su calidad. Están dispuestos a pagar por carne producida sostenible u orgánicamente? Están usando fuentes de información alternativas? Determinar la demanda por atributos de la carne puede requerir un entendimiento de las estrategias de compra de los consumidores. Desarrollamos un marco usando análisis de clases latentes para identificar grupos de consumidores con distintas preferencias por canales comerciales. Luego, estimamos separadamente su demanda por atributos de la carne. Este marco tiene en cuenta la interrelación entre la elección de un canal comercial y la de un producto. Identificamos dos grupos de consumidores, uno orientado a la conveniencia (67%) y otro orientado al servicio (33%). Descubrimos diferencias significativas en la demanda por atributos de la carne entre estos grupos. El grupo orientado al servicio, aunque no dispuesto a pagar por atributos de la carne, usa al vendedor como una fuente de aseguramiento de la calidad. Notamos que ignorar la interrelación entre las preferencias por el vendedor y el producto, puede llevar a estimaciones sesgadas de la demanda por un producto.

Palabras Clave: modelación de decisiones, experimento de elección, carnicero, carne, Argentina

Eje Temático: Economía de la producción, demanda y oferta de alimentos

1. Introduction

Argentina has a long-term tradition of producing and consuming beef. It is the world's fourth highest producer, and by far the world's highest consumer of beef products. Consumption of

meat products in this country is six times the world average, and exceeds that of the USA by 50% (FAO, 2012). In a study that assessed perception of meat quality as a function of consumers' familiarity with the product, Borgogno *et al.* (2015) found that highly familiar consumers needed more information for making a choice. It can be presumed, then, that product information is particularly important for beef trade in this market. Food retailing in Argentina has historically been based on specialized, small stores: bakeries, butcher shops, vegetable stores, etc. Butchery, in particular, is a culturally strong occupation, due to the fact that beef is the most important local value chain. Butchers also play an important role in the communication process of beef attributes; Fenger *et al.* (2014) found that storytelling had a favorable effect on meat choice. In spite of the rise of supermarkets since the 1960s (Ablin, 2012), sixty percent of consumers still buy their meat from butcher shops (Bisang, 2003). Of all meat points of sale in the capital city, Buenos Aires, 78% are butcher shops and 22% are supermarkets (Buenos Aires Store Occupancy Office). Consumers who purchase beef from supermarkets also patronize butchers (Aulicino *et al.*, 2007). As a result, supermarkets have registered a decline in market share between 2001 and 2010, as compared to traditional markets (providing individualized service) and mini-markets (small self-service stores) (Ablin, 2012).

Butcher shops and supermarkets play different roles in the beef supply chain. Butcher shops are price takers, and since they demand lower quantities, they are unable to make direct contracts with cattle producers. On the other hand, supermarkets demand high quantities of beef with a consistent quality throughout the year. They either produce their own beef, or have direct contracts with producers. They negotiate commissions and prices directly with their suppliers. Butcher shops buy through many intermediaries (slaughterhouses, brokers), and therefore pay higher prices. Butchers process, cut and package meat at the point of sale, while supermarkets sell pre-packaged meat, usually cut and packaged in supermarket processing plants. Nowadays three large supermarket companies dominate the retail landscape, also operating in the cattle market. These three companies own six different supermarket chains and control 75% of the supermarket market share (Santellán, 2011).

Ranches that sell to supermarkets, and supply high quantities of a consistent quality throughout the year, are usually large in size. These feed-lot-style operations make significant investments in assets to handle large amounts of cattle, and they usually feed livestock with energy concentrates while keeping them in confined corrals. Cattle raised in this system reaches commercial weight faster, increasing profits. They also use less land allowing farmers to incorporate farming activities in residual land, taking advantage of increasing international grain prices. The traditional system, on the other hand, consists of cattle being spread across large areas of land, grazing pastures. Farms that use traditional systems are usually located in lower quality land, usually not suitable for crops. These ranches don't reach high beef production quantities, and therefore have to use many intermediaries (Bisang, 2003). Profits for this type of farms are typically lower, and their product usually ends up in a butcher shop (Bisang, 2003). Grass-fed beef is leaner and has lower fat and cholesterol content compared to feed-lot beef, and it is also higher in precursors for vitamin A and E and cancer fighting antioxidants (Daley *et al.*, 2010).

Although beef at butcher shops doesn't always come from traditional farms, consumers still prefer to buy at butcher shops. This is due to many reasons. Argentinean consumers identify meat offered in shelves as "a massive product that does not respond to their personal taste", and even when supermarkets offer an integrated butcher, they don't perceive him as a real butcher but as "just a supermarket employee" (Aulicino *et al.*, 2007). Seventy-seven percent of the supermarkets have an integrated butcher option. Aulicino *et al.* (2007) found that consumers relate tenderness and freshness to beef sold from butcher stores. They also found that consumers relate attributes such as advice, the opportunity of choosing the meat cut, and trust, to butcher stores instead of supermarkets. Argentinian shoppers prefer meat to be cut and packaged at the moment of purchase.

On the other hand, consumers attribute competitive prices and good hygiene to supermarkets (Aulicino *et al.*, 2007).

Consumer product purchasing decisions are known to involve two choices: retail outlet and product choice (Hawkins *et al.*, 1992). If appropriate marketing recommendations for both retailers and manufacturers depend on the decision strategy generally used by the target market, then it is necessary to understand consumer preferences for not only beef products, but also beef retailers. We develop a framework that accounts for the interrelationship between Argentinean consumers' preferences for retail outlet and beef product choice to understand the main drivers of store patronage and demand for beef product characteristics. We utilize this approach to identify which types of consumers are demanding traditionally-produced beef and to understand if there are particular store characteristic that drive the beef product decision. We explore the role of trust in the retailing system, and investigate whether it can act in place of product labeling and certification.

2. Materials and Methods

2.1. Framework and Empirical Methodology

We use experimental choice modelling methods to analyze consumers' preferences for beef retailers and products. Our framework accounts for the interrelation between retailer choice and beef product selection by identifying groups of consumers with different retailer patronage behavior and separately estimating their demand for beef product characteristics. Choice modelling has become an increasingly important mode of studying economic behavior and demand patterns, since this methodology allows the researcher to estimate marginal values for various attributes embodied in different goods or services, including non-market goods and services for which such marginal valuations are difficult or impossible to measure by examining revealed preferences. In addition, choice modeling allows for relatively straightforward estimation of welfare effects arising from incremental changes in the levels of the attributes included in the analysis (Colombo, Hanley, & Louviere, 2009). Within the agricultural and food economics literature, choice experiments have been used extensively for analyzing consumer preferences food certification and food quality attributes (e.g., Loureiro and Umberger, 2007, Lusk *et al.*, 2003, Nilsson *et al.*, 2006, Lusk *et al.*, 2006, Ortega, Wang, Olynk Widmar, 2014, Ortega *et al.*, 2011 and Ubilava and Foster, 2009), adoption of voluntary practices by farmers (Ortega, Wang, Olynk Widmar, Wu, 2014 and Schulz and Tonsor, 2010), and to quantify welfare effects of various agricultural and food policies (Lusk and Briggeman, 2009 and Ortega *et al.*, 2011).

In the context of this study, the use of choice experiments allows us to elicit consumer preferences for different retailer characteristics, and willingness to pay (WTP) for different beef product attributes. Choice experiments represent an empirical application and extension of the theoretical and conceptual work of Lancaster (1966), and they closely simulate real world purchasing decisions. In these experimental settings, consumers are asked to choose among a series of alternative attribute bundles. Suppose that individual n faces K alternatives contained in during choice task . We can define an underlying latent variable that denotes the indirect utility function associated with individual n choosing option during choice task . For a fixed time or budget constraint, individual n will choose alternative j so long as . The researcher does not directly observe , but instead directly observes the actual utility maximizing choice , where:

(1)

Following standard practice, we assume that indirect utility is linear, which ensures that marginal utility is strictly monotonic in traits and yields corner solutions in which only one good is purchased (Useche, Barham & Foltz, 2013). We can write individual n 's indirect utility function as:

(2)

where x_j is a vector of attributes for the j^{th} alternative, β_j is a vector of taste parameters (i.e., a vector of weights mapping attribute levels into utility), and ϵ_j is a stochastic component of utility that is independently and identically distributed across individuals and alternative choices, and takes a known distribution (Gumbel or extreme value type I.) This stochastic component of utility captures unobserved (to the econometrician) variations in tastes and errors in individual's perceptions and optimization.

Because consumers are a heterogeneous group, their preferences for various retailer and product attributes may also be heterogeneous. Two common methods of evaluating preference heterogeneity are the estimation of random parameters logit (RPL) models, and latent class analysis. RPL models provide a continuous measure of preference heterogeneity and allow for estimation of individual-specific preference parameters. Alternatively, latent class analysis allows for the identification of consumer groups with similar underlying preferences; that is distinct groups or classes of consumers with homogenous preferences.

Following the RPL specification in Train (2003), the probability that individual chooses alternative j in choice task s is given by

$$(3)$$

where x_j and β_j are the attribute levels and the marginal utility parameters, and the vector γ refers collectively to the parameters characterizing the distribution of the random coefficients (e.g. mean and covariance of ϵ_j , which the researcher can specify.

In latent class analysis, γ is discrete, taking distinct values (Train, 2003). The probability that consumer s selects option j in a given choice task, s , unconditional on the class is represented by

$$(4)$$

where γ_k is the specific parameter vector for class k , and π_k is the probability that consumer falls into class k . This probability can be conditioned by a vector of household or individual characteristics, z , and coefficient vector corresponding to membership in class k , δ_k , in a similar logit function:

$$(5)$$

We can therefore re-write equation (4) as

$$(6)$$

This latent class specification facilitates the identification of consumers with similar preference structures.

Our choice experiment approach allows for estimation of the tradeoffs consumers make when choosing a given beef retailer or product and accounts for the interrelationship of both choices. In choice experiment data analysis, estimation can be performed in either preference space or in willingness-to-pay space (WTP-space) (Scarpa, Thiene & Train, 2008). Coefficients obtained from models in preference space represent individual's preferences or marginal utilities for the various attributes. The vector of parameters defining preferences over the attributes represent marginal utilities. The marginal rate of substitution (MRS) of one attribute for the other is simply the ratio of the two marginal utilities. Models estimated in WTP-space are reparameterized so that the coefficients estimated directly represent trade-offs individuals are willing to make; most often this trade-off is calculated in terms of money or willingness to pay. This approach facilitates direct control of the distribution of MRS estimates (as opposed to relying on the ratio of two marginal

utility estimates with potentially undefined properties) and allows researchers to distinguish variation in preference (or MRS) versus scale heterogeneity¹.

2.2 Data

Data for this study were collected from individual surveys of consumers who were intercepted at different beef purchasing locations in the city of Buenos Aires between July 15th and 25th, 2015. The sampling frame was comprised of a listing of all meat retailers (765) in the central area of the city, made available by the Buenos Aires Store Occupancy Office. A multistage sampling approach was used to form the survey sample. First we divided the area selected into 15 neighborhoods, each of which had approximately 10 supermarket stores and 41 butcher stores. Then, we randomly selected a supermarket and a butcher shop in each of these areas to intercept and interview consumers. Within each retail outlet 10-12 consumers were selected at random and the survey was administered by trained enumerators at point of purchase. This approach allows us to capture consumers with a beef purchasing intention, while being cognizant that a single consumer may frequent multiple types of beef retailing outlets. A total of 306 useable observations were collected.

The survey was designed to collect basic socio-demographic data as well as beef consumption and purchasing information. To further understand beef purchasing behavior, consumers were asked to describe their current beef provider and to rate, via a Likert scale, how important production practices were in their product quality perception. Table 1 summarizes relevant characteristics of our sample. The majority of respondents were female, 52 years of age, mostly with a complete secondary education. The average household size was 3, with an income per capita of AR\$ 8,500 (US\$ 850). Respondents reported consuming over 2.5 pounds per person of beef a week, going to the butcher shop almost 5 times per month, and buying beef from the supermarket a little over two times a month. Sixty eight percent of the consumers in our sample reported thinking that production practices, when known, are an important or very important cue for their beef quality perception. Additionally, sixteen percent of the respondents reported that receiving price advice was as one of the characteristics of their current butcher, and 33% of the respondents reported having a long-term relationship with their beef retailer.

Because data on consumer preferences for store and product characteristics is not readily available, we elicited preferences for selected retailer and beef product attributes using choice experiments. The survey was composed of two separate choice experiments – one for store attributes and one for beef attributes. Selection of attributes characterizing each decision was based on a thorough review of the literature and consumer focus group discussions.

¹ Interested readers are pointed to Scarpa, Thiene & Train (2008) and Sonnier, Ainslie & Otter (2007) for a more in-depth discussion of the advantages of estimating choice models in WTP-space.

Table 1: Summary statistics of consumers in sample

Variable	
<i>Gender (%)</i>	
Female	68.63
<i>Age</i>	
Mean	52
Standard deviation	(16.00)
<i>Household size</i>	
Mean	2.93
Standard deviation	(1.67)
<i>Education (%)</i>	
Primary	10.13
Secondary	51.31
Undergraduate	33.33
Graduate	5.23
<i>Household monthly income per capita</i>	
Mean	8,500.78
Standard deviation	(4520.68)
<i>Household weekly per capita meat consumption (kilograms)</i>	
Mean	1.16
Standard deviation	(1.07)
<i>Monthly purchase trips</i>	
Beef from butcher stores	
Mean	4.89
Standard deviation	(4.59)
Beef from supermarkets	
Mean	2.14
Standard deviation	(3.31)
<i>Importance of production practices in beef quality perception (% of consumers reporting)</i>	
Not Important	15.36
Somewhat Important	4.58
Neutral	11.76
Important	14.38
Very Important	53.92
<i>Survey location (% of surveys per zone)</i>	
North	46.73

South	63.27
<i>Retailer that gives price advice (% of consumers reporting)</i>	
Yes	15.69
No	84.31
<i>Long term retailer-consumer relationship (% of consumers reporting)</i>	
Yes	33.33
No	66.67
<i>Sample Size</i>	306

Source: author's calculations.

2.2.1 Retail Choice Experiment

The retail choice experiment is comprised of 4 attributes ranging from 3 to 4 levels: store size, butcher type, variety and shopping time.

Although previous studies suggest that 60% of Argentinean consumers' prefer butcher stores (Iglesias & Ghezan, 2010), it is not clear whether this is a result of consumers having a preferences for small stores or whether this is driven by the level of personalized service provided by a butcher. As such we evaluate store size as a determinant of retailer choice using 3 levels: Small, Medium and Large. Size 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 is based on the European Union Law. In this study, small firms were defined to have less than 5 employees, medium between 5 and 15, and large more than 15.

To determine the degree to which retail choice is driven by consumers' value for customer of service, we evaluated four levels of a 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 respondents' current beef provider. An ideal butcher represents "the best beef provider you can imagine" allowing for a relative comparison of consumers' current beef provider.

Since consumers in Argentina are exposed to different levels of variety depending on the beef retailing location, we included beef product variety as an attribute. It is worth noting that in this context, high variety of beef products is not necessarily associated with supermarkets. In general, higher levels of beef product variety are mostly found in butcher shops, although there are exceptions. 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 medium variety, and beef, sausage, and offal was considered high variety.

Finally, we include a time variable, which was defined as the number of minutes required for each purchase, including travelling time and time spent in the store location. This attribute is analogous to a price or income variable and better characterizes the retail choice decision. The levels for the time attribute which range from 10 to 60 minutes were selected via focus groups discussions. Table 2 summarizes the attributes and levels of the beef retailer choice experiment.

Table 2: Attributes and levels of the beef retailer choice experiment

Size of Store	Butcher	Variety	Time (minutes)
---------------	---------	---------	----------------

Small	Absent	Low	10
Medium	New	Medium	20
Large	Current	High	30
	Ideal		60

2.2.2 Beef Product Choice Experiment

Beef quality can be summarized in four dimensions: hedonic characteristics (such as taste, appearance and smell); health, safety and risk-related attributes, production process (such as organic, animal welfare, and no use of GMO), and convenience (meaning the saving of time, physical or mental energy at one or more stages of the overall meal process: planning and shopping, storage and preparation of products, consumption, and the cleaning up and disposal of leftovers) (Brunso, Fjord, & Grunert, 2002). We elicit consumer preferences for beef product production process-related attributes including the type of operation the animal was raised in, an organic claim and product origin. The product selected for this experiment was a kilogram of young steer's sirloin steak (*bife de chorizo de novillito*), a common type of beef cut in Argentina.

In order to relate the beef product and retail decision, we evaluate the type of operation in which the product was raised as a characteristic of the beef product. This type of information is often conveyed to consumers via point of purchase displays or product packaging, depending on the retail outlet. We conveyed different types of operations using a "name of farm" attribute with four levels representing no information, a family-run farm, an incorporated farm and an integrated incorporated farm which raises cattle from birth until it reaches commercial weight and is sold to a slaughterhouse. These various types of operations were depicted using a standardized naming convention similar to those found in the Argentinean beef sector. The family farm was represented by *Carnes Don Juan Vaca*, the incorporated farm by *Vaca S.A* (denoting *incorporated*), and the integrated incorporated farm by *Cabaña y Estancia Vaca S.A.* (denoting *breeding and ranching incorporated*).

Given rising interest in organic beef production (Corsi & Novelli, 2007), we evaluate the existing organic label in Argentina (Figure 1). The organic claim is regulated by Law 25.127. To be certified as organic, farms do not necessarily have to feed cattle grass all of 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. We note that organic certification in Argentina also requires certain levels of environmental and animal welfare standards. This attribute was presented as either present or not present.

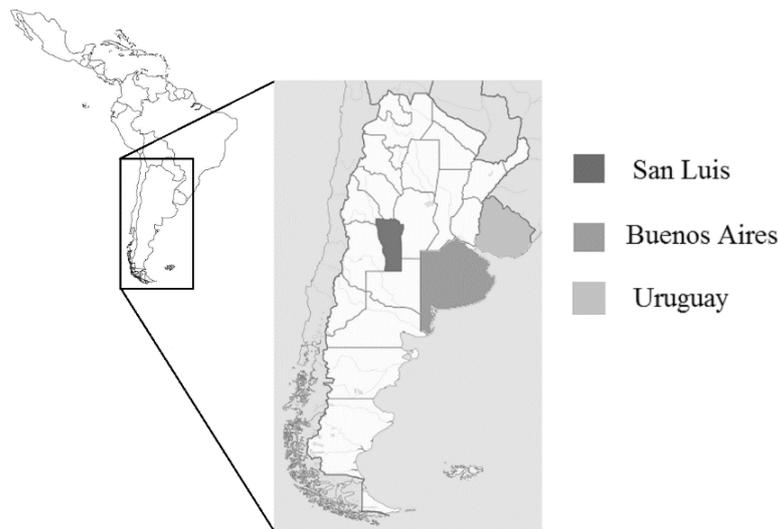
Figure 1. Argentine official organic label



The literature on consumer preferences has investigated the effects that origin claims have on consumer beef purchasing behavior (Loureiro & Umberger, 2007) and local food, unlike organic, is not usually perceived to be as expensive (Felmann and Hann (2014). In this study we include origin as a product attribute to capture consumer preferences for local beef products and also

measure the degree of nationalism associated with beef product purchases. To this end, the origin attribute is comprised of four levels: no information, Buenos Aires, San Luis (Argentina) and Uruguay. Buenos Aires is the province where the city of Buenos Aires is located. Uruguay is a neighboring country, adjacent to and roughly the same size as the province of Buenos Aires, and is also located in the fertile Pampas region. The province of San Luis is another major beef production region in Argentina. Figure 2 shows the relative location of these regions to Latin America in a map.

Figure 2. Production regions in Argentina



Finally, an additional attribute capturing product price per kilogram was included to allow for the estimation of money metric measures for WTP and welfare comparisons. We specified four price levels to be included in our choice experiment. The price levels included were specified based on primary market data collected just prior to implementation of the study. A summary of the attributes characterizing the beef product choice experiment are presented in Table 3.

Table 3: Attributes and levels of the beef steak choice experiment

Name of Farm	Organic Claim	Origin	Price per kg.
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

Note: 1 AR\$ = 0.1 US\$

For both choice experiments, we specified a D-optimal design using a modified Fedorov algorithm with a full-factorial candidate set, eliminating any candidate sets in which one option clearly dominated the other. D-optimality minimizes the weighted determinant of the variance-covariance matrix of the design, where the weight is an exponential weight equal to the inverse of the number of parameters to be estimated. Each choice experiment was made up of 18 choice sets comprised of two hypothetical retailer/product alternatives with the aforementioned attributes and

an opt-out option². Inclusion of a baseline alternative is important for the interpretation of respondent choices and is consistent with economic theory (Louviere, Hensher and Swait, 2000). To avoid the potential for respondent fatigue, the choice scenarios were orthogonally blocked into 3 groups so that each individual only evaluated 6 choice scenarios for each experiment. The experimental blocks were randomly assigned to each participant.

3. Results and Implications

We employed a latent class model to identify groups of consumers with similar preferences for beef store characteristics. This approach has been used in other studies on beef preferences, such as Realini *et al.* (2013), but not yet on preferences for retail channel. Results reveal two distinct groups of consumers with heterogeneous preferences for beef retail attributes between the two classes (Table 4)³. Class membership probabilities show that 67% of the respondents are more likely to be “Convenience Oriented” customers, having only positive preferences for high variety (relative to low and medium). The second group (33%) can be classified as “Service Oriented”. These consumers have significant preferences for the butcher types and would prefer to buy beef from a person they don’t know (new butcher) instead of purchasing from a store shelf (base level). This group of consumers also has positive preferences for the high variety. Utilizing class membership covariates, we find that Service Oriented customers are more likely to live in the southern part of the city, report getting price advice from their current butcher and having known them for a long time. It is worth noting that income was not found to significantly explain or predict class membership. These findings are further supported by comparing observable characteristics for consumers in each of the two groups (Table 5). We note significant differences in beef procurement location, with consumers in the Service Oriented group making more beef purchase trips to a butcher than a supermarket, and reporting knowing their beef provider for a longer time. We find no significant differences in gender, age, income, and beef consumption quantity across the two groups.

Table 4: Latent classes for store preferences

	<u>Class 1 Convenience Oriented</u>		<u>Class 2 Service Oriented</u>	
	Coeff.	Std. Error	Coeff.	Std. Error
<u>Utility Parameters</u>				

² The experiments were designed using Ngene (ChoiceMetrics, 2011).

³ The optimal number classes was determined via exploratory analysis using model fit criteria and context relevance.

Time	-0.064	0.011	***	-0.041	0.007	***
Firm Size						
Big	-0.413	0.229	*	-0.177	0.168	
Medium	-0.162	0.232		-0.148	0.149	
Butcher						
New	-0.431	0.234	*	1.839	0.227	***
Current	-0.125	0.283		2.973	0.272	***
Ideal	-0.137	0.25		2.448	0.266	***
Variety						
High	0.583	0.218	***	1.11	0.199	***
Opt Out	-3.696	0.341	***	-5.244	0.393	***
<i>Thetas in class probability model</i>						
Constant	0.992	0.262	***	--	--	
North	0.679	0.344	**	--	--	
Price Advice	-1.417	0.442	***	--	--	
Know Butcher	-0.847	0.344	***	--	--	
<i>Class probability</i>	0.674			0.326		
N	1836					
No. of parameters	20					
Log Likelihood	-1032.07					
Adjusted Pseudo R-squared	0.488					
AIC	1.146					

Note: ***, **, * represent statistical significance at 1%, 5% and 10% level, respectively. Models presented were estimated in NLOGIT 4.0. Source: author's calculations.

Table 5: Summary statistics of consumers by retailer preference group

Variable	Pooled	Convenience	Service	p-value
<i>Gender (%)</i>				0.815
Female	68.63	69.05	67.7	
<i>Age</i>				0.109
Mean	52	53	49	
Standard deviation	(16.00)	(16.62)	(15.13)	
<i>Household size</i>				0.014
Mean	2.93	2.78	3.28	
Standard deviation	(1.67)	(1.54)	(1.88)	
<i>Education (%)</i>				0.065
Primary	10.13	7.14	16.67	
Secondary	51.31	52.86	47.92	
Undergraduate	33.33	35.24	29.17	
Graduate	5.23	4.76	6.25	
<i>Household monthly income per capita</i>				0.578
Mean	8,500.78	8,598.62	8,287.76	

Standard deviation	(4520.68)	(4575.08)	(4416.03)	
<i>Household weekly per capita meat consumption (kilograms)</i>				
Mean	1.16	1.17	1.15	0.863
Standard deviation	(1.07)	(1.14)	(.90)	
<i>Monthly purchase trips</i>				
Beef from butcher stores				0.051
Mean	4.89	4.54	5.65	
Standard deviation	(4.59)	(4.70)	(4.27)	
Beef from supermarkets				0.001
Mean	2.14	2.62	1.09	
Standard deviation	(3.31)	(3.54)	(2.48)	
<i>Importance of production practices in beef quality perception (% of consumers reporting)</i>				0.006
Not Important	15.36	17.14	11.46	
Somewhat Important	4.58	5.71	2.08	
Neutral	11.76	14.76	5.21	
Important	14.38	15.24	12.50	
Very Important	53.92	47.14	68.75	
<i>Survey location (% of surveys per zone)</i>				0.015
North	46.73	51.43	36.46	
South	63.27	48.57	63.54	
<i>Retailer that gives price advice (% of consumers reporting)</i>				0.000
Yes	15.69	7.62	33.33	
No	84.31	92.38	66.67	
<i>Long term retailer-consumer relationship (% of consumers reporting)</i>				0.000
Yes	33.33	22.86	56.25	
No	66.67	77.14	43.75	
<i>Sample Size</i>	306	210	96	

Source: author's calculations. p-values presented are for joint tests of significance for variables across the two classes (Convenience and Service oriented customers)

To properly model beef product preferences, accounting for retail choice behavior, we test whether beef preferences are significantly different across the two retail preference groups. We model heterogeneity in preferences using a random parameter logit model estimated in WTP-space. For specification purposes, we allow the coefficients of the random parameters (corresponding to the attributes) to vary, taking a triangular distribution⁴. Following Lusk *et al.* (2006) we estimate separate random parameter logit models in WTP-space for beef preferences as well as a model using the pooled data, and find that the null hypothesis of parameter equality across groups can be rejected at any standard level of significance (p-value < 0.001). These findings imply that the consumers in the two retailer preference groups, do indeed behave differently when assessing beef product attributes. We present results of the beef model for the two separate groups as well as the pooled data set (Table 6). Additionally, we test for differences in WTP across the two groups. We find that Convenience Oriented customers (who typically patronize supermarkets to procure their beef products) are willing to pay for local origin (AR\$ 45/kg), organic certification (AR\$ 25/kg) and products sourced from family farms (AR\$ 17/kg). Service-Oriented consumers, however, did not exhibit effective (positive) demand for any of the attributes. These findings indicate that Service Oriented consumers who are willing to patronize a trusted retailer (namely a butcher) are not willing to pay for any additional product information. On the contrary, individuals who are Convenience Oriented are more willing to pay for product labeling and information.

It is worth noting that consumers in the Service Oriented group have high preferences, though not significantly different from zero. When comparing summary statistics, this group reported using

⁴ Various distributions of the random parameters were tested and the triangular distribution outperformed other empirical specification (e.g. log-normal, normal).

production practices (often obtained from a butcher) as a cue to infer product quality more than the Convenience Oriented customer group. This suggests that although this group's WTP for beef attributes is not statistically different from zero, it does not necessarily imply that they have no preference for these attributes. Instead, they use alternative quality assurance strategies other than paying for product information, such as buying from a trusted retailer, to meet their needs. Effectively, Service Oriented customers use their relationship with their butcher to obtain and assess information regarding beef quality.

Comparing demand for beef attributes between the pooled data set and the Convenience Oriented group (which exhibited positive demand for a subset of attributes), reveals that mean estimates from the pooled data are higher. This is likely a result of the point estimates being inflated by the rather high, but statistically insignificant willingness to pay estimates of the Service-Oriented group. While these differences are statically insignificant, utilizing point estimates from the pooled data estimation could lead to biased demand estimates, marketing recommendations and conclusions. For example, willingness to pay for local origin information for the Convenience Oriented group is 27% lower, and demand for organic certification 32% lower than that found in the pooled dataset. Conversely, we find that demand for beef sourced from family farms is 18% higher in the Convenience Oriented group when compared to the pooled data results. As such, providing pricing recommendation to retailers based on results from the pooled data set would lead to suboptimal pricing (Figure 3).

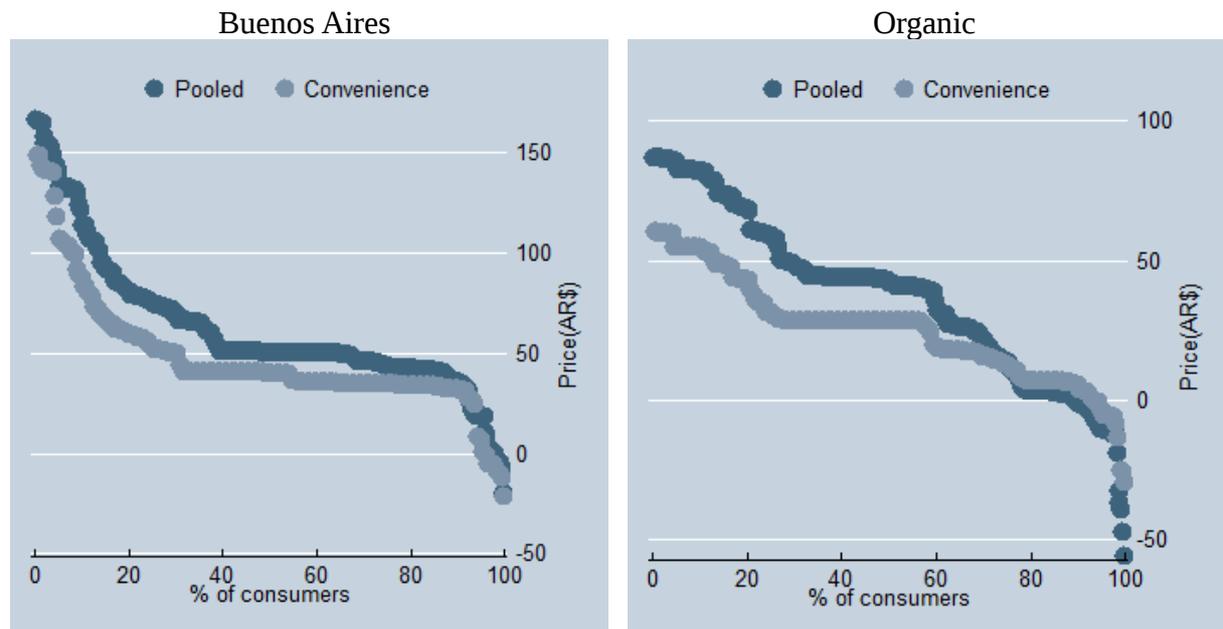
Table 6: WTP estimates for beef steak attributes from RPL model (AR\$/kg).

	Pooled Dataset		Class 1 Convenience		Class 2 Service		Δ <i>p</i> -
	Coeff.	Std. Error	Coeff.	Std. Error	Coeff.	Std. Error	
Random Parameter Mean							
Origin							
San Luis	15.08	(9.41)	7.56	(9.93)	62.28	(41.0)	0.08
Buenos Aires	62.54	(19.6)	45.42	(17.5)	116.8	(77.0)	0.22
Uruguay	-14.88	(11.6)	-17.18	(12.4)	-9.54	(33.7)	0.79
Organic							
Certified	37.26	(13.0)	25.36	(11.8)	80.64	(55.8)	0.33
Farm Name							
Carnes Don Juan Vaca	14.56	(8.67)	17.19	(9.70)	25.84	(29.0)	0.72
Vaca S.A	10.38	(11.2)	7.81	(11.0)	30.29	(41.1)	0.48
S.A.	16.52	(16.1)	13.58	(15.3)	37.80	(56.5)	0.58
Price							
	0.66	(0.00)	0.43	(0.00)	0.86	(0.00)	0.00
Non-Random Parameter							
<i>No buy</i>	-23.99	(1.45)	-29.62	(2.23)	-	(3.37)	0.02
Standard Deviation Estimates							
Origin							
San Luis	20.57	(9.43)	11.23	(12.2)	38.49	(32.3)	0.33
Buenos Aires	55.12	(9.31)	44.55	(7.72)	90.56	(41.6)	0.13
Uruguay	64.61	(10.9)	51.67	(11.5)	95.24	(40.0)	0.17
Organic							
Certified	44.10	(7.90)	29.80	(6.21)	81.44	(41.8)	0.08
Farm Name							
Carnes Don Juan Vaca	41.00	(7.96)	33.88	(8.56)	55.30	(38.6)	0.46
Vaca S.A	9.63	(11.9)	10.02	(12.8)	14.33	(51.8)	0.91
S.A.	11.00	(13.2)	13.85	(10.7)	14.14	(52.9)	0.99
N	1836		1260		576		
No. of parameters	16		16		16		
Log Likelihood	-1063.7		-690.1		-		
Adjusted Pseudo R-squared	0.473		0.501		0.447		
AI	2159		1412		732		

Note: ***, **, * represent statistical significance at 1%, 5% and 10% level, respectively. Models presented were estimated in NLOGIT 5.0 using 1000 Halton draws for the simulations. *p*-values presented are for a tests of

significance for variables across the two classes (Convenience and Service oriented customers). Source: author's calculations.

Figure 3. Demand curves for local (Buenos Aires) and Organic attributes



Our findings suggest that organic and origin certified producers could benefit from selling their products to retail channels that offer convenience and variety, namely supermarkets. Producers that are not able or willing to certify their products as being organic or as coming from a specific place or type of operation, can capitalize on consumer preferences by selling through channels in which trust can substitute for product information.

4. Conclusions

In this study we identify find two groups of consumers with heterogeneous preferences for beef retailer attributes-- Service and Convenience oriented customers—and show that preferences and demand for beef product attributes are different across these two groups. As suggested by Hawkins *et al.* (1992), we find that Argentinean beef purchasing decisions involve both retailer and product choice and consumers use integrated retailer-product strategies when evaluating beef products. We find that a significant portion of beef consumers in Buenos Aires are “Service Oriented” and utilize their beef provider as source of product information, rather than paying for this type of information through labeling or certification. As such, butcher shops and other service-focused stores should capitalize on consumer trust and their relationship with the customer as part of their marketing strategy.

Given its importance in the Argentinean diet, beef serves as a benchmark to study consumer preferences for retail channel and food product attributes. Although Argentinean consumers may show similar preferences in other meat products, WTP values for food product attributes will differ according to varying compositions of relevant retail channel and product-specific characteristics. While this study focuses on one market and on a single commodity, the implications of our findings go beyond the Argentinean market for beef. Our findings are of particular importance to understanding consumer food preferences in emerging markets where the retail sector is rapidly changing. While we are able to identify a relationship between retail channel and food product preferences in our specific context, additional research is needed to understand how decision making heuristics inform consumer preferences and purchasing decisions in other products, markets and across regions. We

conclude that future research on food preferences as well as marketing recommendations should take into account retail choice behavior when analyzing consumer demand for food products.

References

1. Ablin, A. (2012). *El Supermercado Argentino*. Buenos Aires, Argentina: Área de Industria Agroalimentaria - Dirección de Promoción de la Calidad de Productos Agrícolas y Forestales - Subsecretaría de Agregado de Valor y Nuevas Tecnologías.
2. Altenburg, T. (2000). *Linkages and Spill Overs Between Transnational Corporations and Small and Medium Sized Enterprises in Developing Countries: Opportunities and Policies*. Bonn, Germany: German Development Institute.
3. Aulicino, J. M., García Valiño, S., Pereyra, A. M., Abbiati, N. & Ferrari, C. (2007). *Evaluación de las Problemáticas y Oportunidades de Mejora de los Puntos de Venta Minoristas de Carne Vacuna en Argentina: su Análisis Comparativo con Países Competidores*. Buenos Aires, Argentina: Instituto de Promoción de la Carne Vacuna Argentina.
4. Ayyagari, M., Beck, T., & Demircuc-Kunt, A. (2007). Small and medium enterprises across the globe. *Small Business Economics*, 29(4), 415-434.
5. Bisang, R. (2003). *Eficiencia y Redes Productivas: La industria de las carnes en Argentina*. General Sarmiento, Argentina: Instituto de Industria, Universidad Nacional de General Sarmiento.
6. Borgogno, M., Favotto, S., Corazzin, M., Cardello, A. V., & Piasentier, E. (2015). The role of product familiarity and consumer involvement on liking and perceptions of fresh meat. *Food Quality and Preference*, 44, 139-147.
7. Brunsø, K., Fjord, T. A., & Grunert, K. G. (2002). Consumers' food choice and quality perception. *The Aarhus School of Business Publ.*, Aarhus, Denmark.
8. ChoiceMetrics. (2012). *Ngene 1.1. 1 User Manual & Reference Guide*. Sydney, Australia: ChoiceMetrics.
9. Colombo, S., Hanley, N., & Louviere, J. (2009). Modeling preference heterogeneity in stated choice data: an analysis for public goods generated by agriculture. *Agricultural Economics*, 40(3), 307-322.
10. Corsi, A., & Novelli, S. (2007). Italian consumers' preferences and willingness to pay for organic beef. In *Organic Food* (pp. 143-156). Springer New York.
11. Daley, C. A., Abbott, A., Doyle, P. S., Nader, G. A., & Larson, S. (2010). A review of fatty acid profiles and antioxidant content in grass-fed and grain-fed beef. *Nutrition journal*, 9(1), 1.
12. Dirección General de Estadística y Censos de la Ciudad de Buenos Aires. (2015). *Ingresos en la Ciudad de Buenos Aires. 1er. trimestre de 2015. Informe de resultados 877*. Buenos Aires, Argentina: Ministerio de Hacienda. Retrieved on March 1st, 2016 from https://www.estadisticaciudad.gob.ar/eyc/wp-content/uploads/2015/07/ir_2015_877.pdf

13. Feldmann, C., & Hamm, U. (2015). Consumers' perceptions and preferences for local food: A review. *Food Quality and Preference*, 40, 152-164.
14. Fenger, M. H., Aschemann-Witzel, J., Hansen, F., & Grunert, K. G. (2015). Delicious words—Assessing the impact of short storytelling messages on consumer preferences for variations of a new processed meat product. *Food quality and preference*, 41, 237-244.
15. Food and Agriculture Organization of the United Nations. (2012). FAOSTAT Database. Rome, Italy: FAO. Retrieved March 1st, 2016 from <http://faostat3.fao.org/home/E>
16. Fitjar, R. D., & Rodríguez-Pose, A. (2011). Innovating in the periphery: firms, values and innovation in Southwest Norway. *European Planning Studies*, 19(4), 555-574.
17. Hawkins, Del I., Best, R. J., & Coney, K. A. (1992). *Consumer behavior: implications for marketing strategy*. Homewood, IL, USA: Irwin.
18. Iglesias & Ghezan. (2010). Análisis de la Cadena de la Carne Bovina en Argentina. Estudios Socioeconómicos de los Sistemas Agroalimentarios y Agroindustriales N°5. Buenos Aires, Argentina: Ediciones INTA.
19. Lancaster, K. J. (1966). A New Approach to Consumer Theory. *Journal of Political Economy*, 74(2), 132–157.
20. Lertwongsatien, C. & Wongpinunwatana, N. (2003). E-commerce adoption in Thailand: an empirical study of small and medium enterprises (SMEs). *Journal of Global Information Technology Management*, 6(3), 67-83.
21. Loureiro, M. L., & Umberger, W. J. (2007). A choice experiment model for beef: What US consumer responses tell us about relative preferences for food safety, country-of-origin labeling and traceability. *Food Policy*, 32(4), 496–514.
22. Louviere, J. J., Hensher, D. A., & Swait, J. D. (2000). *Stated choice methods*. New York: Cambridge University Press.
23. Lusk, J. L. (2003). Effects of cheap talk on consumer willingness-to-pay for golden rice. *American Journal of Agricultural Economics*, 85(4), 840-856.
24. Lusk, J. L., & Briggeman, B. C. (2009). Food values. *American Journal of Agricultural Economics*, 91(1), 184-196.
25. Lusk, J. L., Norwood, F. B., & Pruitt, J. R. (2006). Consumer demand for a ban on antibiotic drug use in pork production. *American Journal of Agricultural Economics*, 88(4), 1015-1033.
26. Lusk, J. L., Roosen, J., & Fox, J. A. (2003). Demand for beef from cattle administered growth hormones or fed genetically modified corn: a comparison of consumers in France, Germany, the United Kingdom, and the United States. *American journal of agricultural economics*, 85(1), 16-29.
27. Nilsson, T., Foster, K., & Lusk, J. L. (2006). Marketing opportunities for certified pork chops. *Canadian Journal of Agricultural Economics/Revue Canadienne d'Agroeconomie*, 54(4), 567-583.
28. Ortega, D. L., Wang, H. H., Olynk, N. J., Wu, L., & Bai, J. (2011). Chinese consumers' demand for food safety attributes: a push for government and industry regulations. *American Journal of Agricultural Economics*, aar074.

29. Ortega, D. L., Wang, H. H., Widmar, N. J. O., & Wu, L. (2014). Chinese producer behavior: Aquaculture farmers in southern China. *China Economic Review*, 28, 17-24.
30. Ortega, D. L., Wang, H. H., & Widmar, N. J. O. (2014). Aquaculture imports from Asia: an analysis of US consumer demand for select food quality attributes. *Agricultural Economics*, 45(5), 625-634.
31. Ortega, D. L., Wang, H. H., Wu, L., & Olynk, N. J. (2011). Modeling heterogeneity in consumer preferences for select food safety attributes in China. *Food Policy*, 36(2), 318-324.
32. Realini, C. E., Kallas, Z., Pérez-Juan, M., Gómez, I., Olleta, J. L., Beriain, M. J., Albertí, P., & Sañudo, C. (2014). Relative importance of cues underlying Spanish consumers' beef choice and segmentation, and consumer liking of beef enriched with n-3 and CLA fatty acids. *Food Quality and Preference*, 33, 74-85.
33. Santellán. (2011). *Informe Relevamiento sobre Supermercados en Argentina*. Buenos Aires, Argentina: Federación Argentina de Empleados de Comercio y Servicios. Secretaria de Estudios y Estadísticas.
34. Scarpa, R., Thiene, M., & Train, K. (2008). Utility in willingness to pay space: a tool to address confounding random scale effects in destination choice to the Alps. *American Journal of Agricultural Economics*, 90(4), 994-1010.
35. Schulz, L. L., & Tonsor, G. T. (2010). Cow-Calf Producer Preferences for Voluntary Traceability Systems. *Journal of Agricultural Economics*, 61(1), 138-162.
36. Sevilla, R. C., & Soonthornthada, K. (2000). SME policy in Thailand: vision and challenges (No. 251). Institute for Population and Social Research, Mahidol University.
37. Sonnier, G., Ainslie, A., & Otter, T. (2007). Heterogeneity distributions of willingness-to-pay in choice models. *Quantitative Marketing and Economics*, 5(3), 313-331.
38. Train, K., 2003. *Discrete Choice Methods with Simulation*. New York: Cambridge University Press.
39. Ubilava, D., & Foster, K. (2009). Quality certification vs. product traceability: Consumer preferences for informational attributes of pork in Georgia. *Food Policy*, 34(3), 305-310.
40. Useche, P., Barham, B. L., & Foltz, J. D. (2013). Trait-based adoption models using ex-ante and ex-post approaches. *American Journal of Agricultural Economics*, 95(2), 332-338.
41. Vives, A. (2006). Social and environmental responsibility in small and medium enterprises in Latin America. *Journal of Corporate Citizenship*, 2006(21), 39-50.