Consumers preferences for potatoes with quality attributes in Argentina

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Introduction

When purchasing food, consumers make their choices by comparing prices and qualities. Such choices are definitely conditioned by the uncertainty they perceive in relation to the different qualities offered and by the information available to them.

The concept of quality has become crucial in the new approaches of Demand Theory (Lancaster, 1966), who affirms that consumers derive utility from goods´ attributes, not directly from goods. Consumers´ choices are definitely conditioned by the uncertainty they perceive with regard to different qualities offered. Consequently, quality has started to be incorporated as an additional variable in food demand functions (Antle, 1999). As a wide and subjective notion, it deals with different kinds of attributes which could either be verified by consumers or not, before or after purchasing food e.g., colour, flavor, nutritional facts, added substances during the productive processes and risks perceptions, retail channel preferences, knowledge about varieties, and opinions regarding private or public regulation systems. Govindasamy and Italia (1999) reported that higher income earners and younger people were more willing to purchase integrated pest management produce than lower income earners and older people.

The aim of this research is twofold: to examine consumers' preferences for potatoes quality attributes and also to identify those factors associated to purchase of potato quality. For these purposes we have analysed socio-demographic variables, potato purchasing habits, perceptions and attitudes towards potato quality attributes. The importance of prices in potato buying decisions and also consumers´ willingness-to-buy high quality potatoes.

Theoretical background

Perception and evaluation of food quality

Consumers' evaluation of quality plays a major role when selecting and consuming fresh foods. In the case of unprocessed food, lacking brands, other factors are influencing purchasing decisions. Consumers use various intrinsic and extrinsic cues to infer food quality (Alfnes, 2004). Beside intrinsic cues such as fat content and appearance, extrinsic cues, such as price, labels or packaging are becoming increasingly important to consumers. Thus, in order to meet consumers' expectations and preferences, it becomes important for producers to know which quality cues and attributes are relevant and available to consumers. And, from a consumers' perspective, certain qualities have to be visible and understandable in order to reduce uncertainty about the product and consumer dissatisfaction. Thus, any effort to differentiate products and promote food quality will only be successful if new or advanced attributes can be communicated to consumers (von Alvensleben and Scheper, 1997).

Steenkamp (1990) developed a model of the quality perceptions process that describes the way in which consumers form perceptions about the quality of a product in purchase decisions. It offers a useful framework for uncovering the effects of quality cues and attributes on perceived quality. Quality characteristics are identified as intrinsic and extrinsic quality cues and experience and credence quality attributes. Quality cues are used in the development of perceived quality by the individual. This quality perception involves three processes: 1. Cue adquisitions and categorization 2. Quality attributes belief formation, and 3. Integration of quality attributes beliefs. This process is influenced by personal and situational variables. Caswell *et al.* (2000) indicate that food quality attributes can be analyzed along a Unified Quality Framework as it is used as the basis of our empirical work (Figure 1)
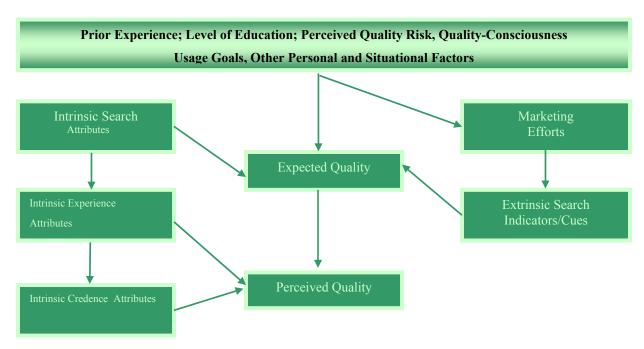
Prior Experience; Level of Education; Perceived Quality Risk, Quality-Consciousness

Usage Goals, Other Personal and Situational Factors

Intrinsic Search Attributes		Marketing Efforts
	Expected Quality	
Intrinsic Experience Attributes		Extrinsic Search Indicators/Cues
Intrinsic Credence Attributes	Perceived Quality	

Figure 1. A Unified Quality Framework

Source: Caswell *et al.* (2002)

In our application, the following quality characteristics related to the purchase of potatoes were analyzed:

1. Food safety:
      Pesticide or Drug Residues   Intrinsic Quality attributes
      Food safety   Credence Quality Attributes
      Health   Credence Quality Attributes
 2. Nutrition:
      Calories   Intrinsic Quality Cues
      Fat content   Intrinsic Quality Cues
      Carbohydrates and Fiber content Intrinsic Quality Cues
      Protein content and Vitamins   Intrinsic Quality Cues
3. Sensory:
      Colour
      Appearance   Extrinsic Quality Cues
      Softness   Intrinsic Quality Cues
      Smell   Intrinsic Quality Cues
      Freshness   Experience Quality Attributes
      Kind variety   Intrinsic Quality Cues Sensory
      Taste/flavor   Experience Quality
4. Value/Function Attributes:
      Size, Preparation/convenience, Packaging
5. Image:
      Brand   Extrinsic Quality Cues
      Price   Extrinsic Quality Cues
      Labels   Extrinsic Quality Cues
6. Process:
      Local   Credence Quality Attributes
      Integrated pest management potato   Credence Quality Attributes
      Origin   Credence Quality Attributes

Data

Data come from a household survey we conducted in Mar del Plata city, Argentina, in June 2009 using a questionnaire - based face to face interviews. A representative sample of the population in this city included 500 randomly selected households. The survey included questions concerning different socio-economic and demographic factors such as household income (Respondents were asked to choose categories of income due to reluctance to give specific income values), household size, employment status, education level and age. Respondents were also asked about their shopping habits and attitudes. These questions were related to the frequency of potato shopping and consumption, attitudes toward food safety, perceptions of good and also bad potato quality. Willingness- to-purchase and to pay a higher price for an integrated pest management potato was also included in the questionnaire.

Results

Consumers' perception about potatoes quality attributes

Some factors related to consumer attitudes and perceptions of potato quality attributes included in this study were selected from discussions with consumers, producers and retailers' focus groups (Rodríguez *et al.,* 2008).

Consumers with high education level are more likely to be worry about health, food nutritional content and pesticide usage in the production process. By contrast, price is not relevant for them. Potatoes were consumed at least 1-2 times a week by nearly 35% of the interviewers. The main reason to purchase potatoes regardless education is the appearance (66 %), size (62 %) and skin colour (34 %). Consumers mainly prioritize taste/flavor (48 %) and smell (15 %).

In this sample the household size is between two and four members *per* household. Respondents who have reached the lowest educational level belong to the largest households' size. The higher the educational level, the higher the household monthly income. 45% of respondents have declared a monthly income not higher than $ 2,000 Argentinean pesos   (1 US dollar = 3.8 Argentinean Pesos, Exchange rate June 2009).

Respondents have declared health care, nutritional content and lack of agrichemicals content in food as the most important reasons they take into account when purchasing food products. The average score given by consumers to risk in consuming potatoes with pesticide and fertilize content is high (8 points).

Motives for buying potatoes. Respondents have considered the visual appearance (e.g., no scratches or bruises) and also the size, as the most important extrinsic attributes when selecting potatoes and the marketplace. These results have been verified for respondents within all the educational levels. Among the higher educational level respondents, potato price is not an emphasized attribute. After purchasing potatoes and when they cook and prepare a wide range of meals, all the respondents have highlighted the flavour and the softness as the most relevant intrinsic potato attributes.

Sale channel. All the respondents, regardless their educational level, have declared their preferences for buying potatoes at greengroceries and supermarkets shops.

Weekly potato purchases. Respondents who have reached the lowest educational level usually buy fewer kilograms of fresh potatoes per week (3.15 kgs) than respondents who have reached the highest educational level (4.56 kgs.)

Product quality and price potato association. As the educational level increases, the number of respondents who declared that the price of product is a trustful sign of its quality falls. In fact, 96% of those who have the lower educational levels uphold this opinion. This figure decreases to 49% in the case of respondents with a higher educational level. Respondents associate a bad quality with scratches, bruises, sprouted and gummy potato. Respondents who have reached an upper education level also consider that a bad quality potato is dirty or sprouted.

When asked about willingness-to-pay for fresh potatoes of better quality, a high *per* percentage of households (34%), were willing to pay a price premium of $ 0.50 peso *per* kilo and only 19 % were willing to pay a price

premium of $ 1 . A great proportion of respondents, who have reached a lower educational level consider that food quality controls are satisfactory.

Empirical analysis based on the Ordered Logit Model

An Ordered Logit Model was applied to identify the quality attributes that are influencing consumers´ evaluation of potatoes quality and to estimate the probability of consumers´ frequency and making purchase. Consumers´ willingness-to-buy potatoes is expressed in frequency of consumption, such 1-2 times a week, 3-4 times a week and 5 or more times a week. And the attributes are included in the Ordered Logit Model to evaluate their impact on consumers´ consumption and purchasing patterns (McCullagh, 1980; Agresti, 2002; Norusis, 2005).

The random sample consisted of 471 households (94% of total sample survey of 500 households).

The results of the estimated model are presented in Table 2:

Table 2. Estimation results for Ordered Logit Model

	Variables	Coefficient Signs	Std. Error	Significance
Threshold	**FRECUENCY (= 0)***	+	0.690	0.059
	FREQUENCY (= 1)***	+	0.713	0.000
Location	**HOUSEHOLD SIZE*****	+	0.060	0.000
	AGE***	+	0.006	0.010
	BALANCED DIET***	+	0.036	0.009
	POTATO FATTENING*	-	0.026	0.060
	PREPARATION / CONVENIENCE**	+	0.040	0.034
	PRICE*	-	0.175	0.003
	EDUCATION (= 0)** **EDUCATION (= 1)**	+ 0[a]	0.217	0.017
	SIZE (= 0)** **SIZE (= 1)**	- 0[a]	0.190	0.017
	SKIN COLOUR (= 0)** **SKIN COLOUR (= 1)**	- 0[a]	0.195	0.030

Level of significance: *** p< 0.01, **p<0.05,* p<0.10
a = This parameter is redundant
n = 471; Link function: logit

Source: Potato Consumption Survey, Mar del Plata-Argentina, June 2009

Definition of variables

Dependent variable:

FRECUENCY: Ordinal variable. The times a week potato is consumed in the household. Categories: 0 = less than once a week-2 times a week , 1 = 3-4 times a week, 2 = 5 and more times a week .

Independent variables

Quantitative explanatory variables:

HOUSEHOLD SIZE: members in the household. Average = 3.3 persons in the household

AGE: Age of respondent. Average Age: 50 years old

BALANCED DIET: If to eat potato is important to have a balanced diet. Average score = 7.18 points.

POTATO FATTENING: If potato contributes to gain weight / get fat. Average score = 5.44 points.

PREPARATION / CONVENIENCE: If potatoes are easy to clean and good to prepare recipes and dishes. Average score = 8.29 points.

PRICE: average price of fresh potato paid *per* kilogram. Average price = US dollar 0.46 (exchange rate, June 2009, 1 US dollar = 3.8 Argentinean Pesos)

Categorical explanatory variables:

EDUCATION: Respondents´ education level. Categorical variable: 0 = modest education, 1 = high education

SIZE: Potato size is an important attribute. Categorical variable: 0 = No, 1 = Yes

SKIN: If Potato skin colour is an important attribute. Categorical variable: 0 = No, 1 = Yes

These measures indicate that the model fits adequately. The model performance results are depicted in Table 3 below:

Table 3. Model performance evaluation

Goodness-of-fit statistics	Significance
Pearson	0.356
Deviance	0.965
Model fitting information	**Significance**
Intercept only	
Final	0.000
Test of Parallelism	**Significance**
Null Hypothesis	
General	0.914
Pseudo R-square	
Cox and Snell	0.18
Nagelkerke	0.21
McFadden	0.10

Source: Potato Consumption Survey, Mar del Plata-Argentina, June 2009

The signs are all as we expected, and they are suggesting that:

⇨ Households with high number of members have a higher probability to consume fresh potato more frequently. **(HOUSEHOLD SIZE)**

⇨ Older respondents consume more frequently fresh potatoes than younger respondents. **(AGE)**

⇨ Households considering potato as a relevant food for a balanced diet are likely to consume more frequently fresh potato. **(BALANCED DIET)**

⇨ There is an inverse relationship between frequency of consumption and the belief that potato helps to get fat. **(POTATO FATTENING)**

⇨ Those consumers considering potato as ´*a food easy to prepare meals and also easy to clean*´ have a higher probability of consuming this good more frequently. **(PREPARATION / CONVENIENCE)**

⇨ Households paying higher average potatoes prices are likely to consume fresh potato less frequently. **(PRICE)**

⇨ Low educated consumers have a higher probability to buy fresh potatoes more frequently. **(EDUCATION)**

⇨ Those who do not care about potato size and skin colour have a low probability to consume fresh potatoes more frequently. **(SIZE** and **SKIN COLOUR)**

Final remarks

According to our research, health care, nutritional content and lack of agrichemicals content in food are the most important reasons that consumers take into account when purchasing food products. The average score given by consumers to risks in consuming fresh potatoes with pesticide and fertilize content is high. In Argentina, there is a little consumer recognition of potato varieties and their uses. This lack of information creates an excellent opportunity for market niche developing. The information provided in food labels could be considered as an instrument to improve consumers´ perception of potato quality. It also makes it easier for consumers to choose products based on their preferences and finally they would be informed about varieties and cooking preparation methods.

Consumers want to assurance that what their purchases meet their expectation for size, colour, texture, and nutritional value. Producers and stakeholders should give to consumers something to look for and tell them they have made the right decisions. A quality label would also benefit the producer striving to maintain a quality product and also inform to those consumers that are willing to buy and pay a price premium for this product.

Acknowledgements

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