

Consumer Demand for Food Quality: A Study Exploring the Search, Experience and Credence Attributes of Powdered Milk

MDSG Piyathilaka, UK Jayasinghe-Mudalige*, LDMN Lokuge, JMM Udugama, JC Edirisinghe and HM LK Herath

Department of Agribusiness Management, Faculty of Agriculture and Plantation Management, Wayamba University of Sri Lanka, Makandura, Gonawila (NWP), 60170, Sri Lanka

Abstract

Utilizing the Caswell classification on food quality (i.e. *Safety, Nutrition, Value, Process, Package*) and the use of information by a consumer (i.e. *Search, Experience, Credence*) as the theoretical base, this study examines empirically the key food quality attributes that consumers take into account as they purchase powdered milk in the marketplace. A Choice Modeling framework was applied to reveal consumers' preferences and their willingness-to-pay for different food quality attributes. Data were collected by way of a personal interview carried out with 134 consumers from urban households located within the Colombo and Galle city limits during March to April 2015 and convenient sampling techniques were applied to select the candidates with varying socio-economic conditions, including education, income and age. The outcome of analysis suggests that consumers concern about certain common attributes such as 'size of the packet' (i.e. 400g) and the 'level of fat' in the product over the other attributes. In fact, they place low value on those pertaining to food safety (e.g. pathogens, toxins, food additives) and nutrition (e.g. calories, vitamins) attributes. The outcome, as a whole, justifies the fact that consumers are "confident" on the status of attributes showing Credence characteristics in milk powder, because they trust the 'third party certification' and 'information labels' as reliable means of transforming those "unseen" Credence attributes into Search and Experience attributes; thus, they do not need to worry ex-ante.

Keywords: Consumer demand, Choice experiment, Credence attributes, Food safety and quality, Milk powder

***Corresponding author:** udith@hotmail.com

Introduction

Consumers pay considerable attention while purchasing food products, especially on their attributes of quality, and due to that reason, prior to purchasing, generally consumers focus on reliable, timely and valid information (Henson and Caswell, 1999). In light of this, it is of interest to examine the key food quality attributes that a consumer, in general, takes into account as he/she purchases an essential food product. Caswell (1998) classified food quality into five major "subsets", each is characterized by several "attributes", namely: (1) Safety (e.g. food additives); (2) Nutrition (e.g. calorie, fat, cholesterol); (3) Value (e.g. size, solubility); (4) Process (e.g. place of origin), and (5) Package (e.g. material, certification, brand name). In another classification, product quality attributes are classified into three major components that explore predominantly the level of information available for the consumer on the product in concern, i.e.: (a) "Search"—reached by a consumer prior to purchase, by looking and examining and searching for information about the product (e.g., price, colour, package); (b) "Experience"—feel the product by using it or due to prior experience, and (c) "Credence"—cannot directly experience or search for the attributes;

thus, the consumer tends to rely basically on the brand name, service quality, and/or recommendations from someone they know. In the context of milk powder, for example, a particular brand supply to the market may be characterized by certain Search (e.g. size, color, and packaging material) and Experience (e.g. solubility) attributes and a third party certification (e.g. HACCP, SLS) and/or information labelling so that a consumer can rely on which, individually and/or collectively, to decide on the status of Credence attributes pertaining to the product (e.g. additives, fat content, calories).

The purpose of this analysis was, therefore, to examine empirically the key food quality attributes that consumers take into account as they purchase powdered milk in the marketplace. The classifications specified above were used to develop the theoretical base and milk powder was considered as the special case on the justification that consumers depend largely on imported products. For example the local production of milk and milk products in Sri Lanka was nearly 26,648,000L and about 69,000 metric tons of milk powder were imported in 2013 (Central Bank of Sri Lanka, 2014).

Materials and Methods

For the purpose of revealing consumers' preferences and their willingness-to-pay for various food quality attributes, a Choice Modeling framework, which is based on Lancasterian Consumer Theory (Lancaster, 1966) and allows a respondent to choose his/her, preferred alternative out of several options available was used. The following expression was, in turn, derived to show the relationship between the unobservable utility levels that i^{th} consumer obtain from choosing the j^{th} option pertaining to food quality, given the fact that an observed choice is a reflection of the latent unobservable utility:

$$U_{ij} = \beta_1*ADD + \beta_2*CAL + \beta_3*FAT + \beta_4*1KG + \beta_5*400g + \beta_6*SOL + \beta_7*ORI + \beta_8*PKG + \beta_9*CRT + \beta_{10}*PRC + \beta_{11}*BRN + \epsilon_{ij}$$

Where, ADD = food additives; CAL = calorie content; FAT = level of fat; 1KG = 1kg packet; 400g = 400g packet; SOL = solubility; ORI = place of origin; PKG = packaging material; CRT = certification; PRC = price; BRN = brand name; $\beta_1 - \beta_{11}$ = coefficients of the variables and ϵ_{ij} = error term.

The choice sets were created by employing a Fractional Factorial Design generated using the Statistical Package for the Social Sciences (SPSS) [version 16]. In order to generate choice cards, attributes in concern were used to generate orthogonal data and 16 choice sets were obtained. Since it was practically impossible to give 16 choice sets to a consumer, those were blocked into 4 blocks using dummy variables created by software. Then, four choice cards which contain four alternatives in each card were created. These options of choices were included into a structured questionnaire and that was used to collect data by way of a personal interview carried out with a cross section of respondents (n=134) selected randomly from urban households located in Colombo and Galle city limits during March to April 2015 to reflect certain socio-economic conditions such as education, income, age etc.

In order to maintain the randomness, the choice cards of four blocks were randomized when the survey was conducted. Finally, the coded choices of respondents were taken to estimate the coefficients of variables used in the empirical model using 'Stata' statistical software and to calculate the Marginal Willingness to Pay (MWTP) for each attribute.

Results, Discussion

Nearly 67.2 percent of respondents in the sample comprised of females and 82.8 percent were married and lived with their family in an owned house. The mean value of age was 37.6 years and more than 92.5 percent of respondents were educated above G.C. E. (Advanced Level). Almost 90 percent of respondents earn a monthly salary by way of full-time work and the monthly household income of 59 percent of respondents was above Rs. 30,000. The results from Conditional Logistic Regression analysis showed that the variable showing the level of fat in full-cream milk powder (FAT) was significant at 1 percent compared to the base level in non-fat milk powder. The variables showing the size of the packet, especially the 400g and 1kg packet were significant at 1 and 5 percent, respectively, highlighting the fact that consumers, in general are pretty much concerned about the size of package and whether it contains 'full-cream' or 'non-fat' as they decide to purchase milk powder.

Figure 1 depicts the Marginal Willingness to Pay (MWTP) calculated that takes into account all variables in the model. The highest MWTP were recorded for 400g packet (2.85) and full cream milk (2.36) highlighting their significance to the consumer. Further, it shows that consumers, in general, hesitate to pay for imported milk powder, rely on a specific brand, and for the milk with food additives.

Conclusions

In conclusion, we may infer that economic and direct health reasons are mostly a matter for consumers as they purchase milk powder from the market, which is 'full' with imported products in combinations of various "sized", "type" (brand) and "priced" packages. While consumers prefer 400g packet over the others, perhaps, due to economic reasons and other Experience quality attributes explored in Caswell's Classification, for example 'easy handling' and 'storability', the negative health effects associated with food safety attributes such as 'fat (and cholesterol)' is also considered heavily compared to other Credence characteristics classified under the food safety sub set, including 'food additives' and 'microbial presence'. Non significance of variables reflecting those attributes in the model implies that consumer can decide on the level and/or status of those food safety and nutrition attributes showing Credence characteristics "indirectly" through the "trust" they place on the

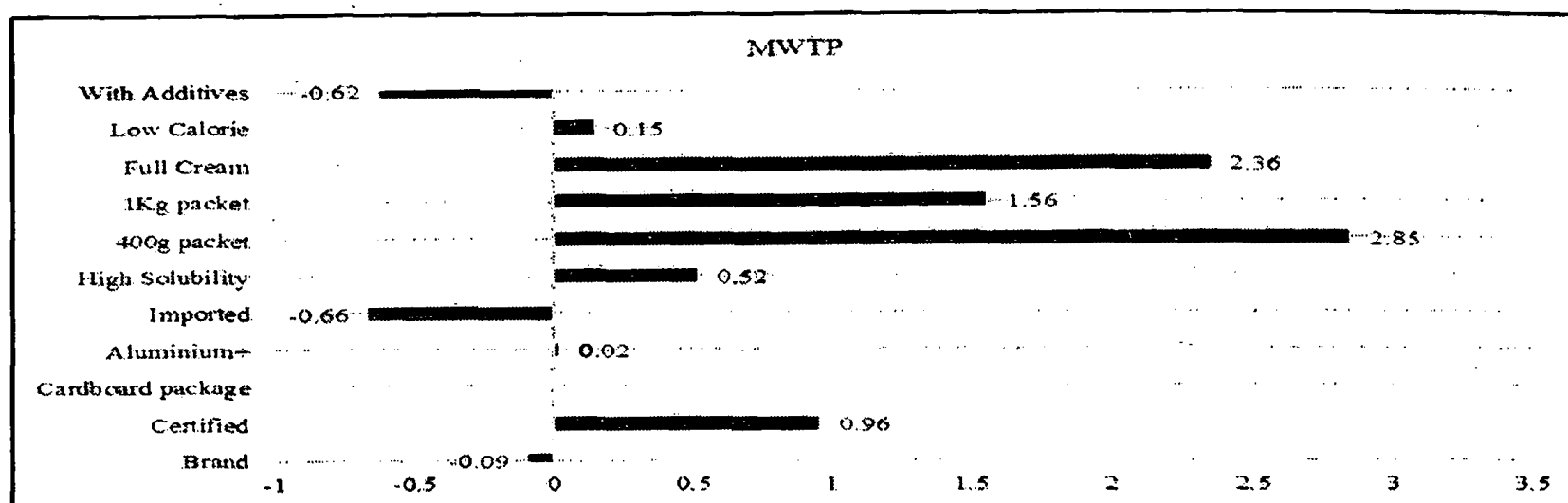


Figure 1: MWTP for quality attributes of Milk powder

'third party certification' and 'informative labels', as suggested by Caswell and Modjuzska (1996), such actions taken by suppliers to show the quality of their products possess the ability to transform those Credence attributes into Search and Experience attributes.

References

- Caswell JA 1998. Valuing the Benefits and Costs of Improved Food Safety and Nutrition. *Australian Journal of Agriculture and Resource Economics*, 42 (December):409-474.
- Caswell JA and Modjuzska EM 1996. Using Informational Labeling to Influence the Market for Quality in Food Products. *American Journal of Agricultural Economics*. 78, 1248-1253.
- Central Bank of Sri Lanka 2014. Sri Lanka Socio-Economic Data (Available from: <http://www.cbsl.gov.lk>: Accessed on 15 May 2015).
- Henson S and Caswell J 1999. Food safety regulation: An overview of contemporary issues. *Food Policy*, 24, 589-603.
- Lancaster KJ 1966. A New Approach to Consumer Theory. *The Journal of Political Economy*, 74(2): 132-157.