

# Assessing Consumer Attitudes Towards Attributes of Quality: The Case of Consumption of Tetra Packed Milk in Sri Lanka

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## ABSTRACT

This study evaluates consumer attitudes and perceptions towards the attributes of quality of a food product based on the four subsets of quality suggested by Caswell (Food safety, nutrition, value and packaging) using the consumer buying behaviour on "tetra-packed" milk products as the case. It uses the data collected through a consumer survey conducted at ten (10) randomly selected super markets, groceries, and milk bars located in the Gampaha district in Sri Lanka over the period of April to May in 2005.

To characterize and weigh up the consumer attitudes on attributes of quality suggested by Caswell, a "Food Quality Responsive Index" (FQRI) was formulated, on which a higher score reflects their willingness for a higher quality food product. With the outcome of FQRI, an Ordered Logistic Regression was carried out to find the relationship of which with respect to a number of socio-economic characteristics of a consumer, such as gender, age, level of education level, marital status, household size and household income etc. The results suggest that these factors have a significant impact on their attitudes towards higher quality, and they value the attributes included in the subsets of "value" and "package" over that included in the "food safety" and "nutrition" sub sets of the Caswell's classification.

**KEY WORDS:** Consumer Attitudes, Fresh milk, Food Quality attributes, Tetra pack, Willingness-To-Pay (WTP).

## INTRODUCTION

Food quality can be defined as the degree of excellence, and includes such things as taste, appearance and nutritional content. And also quality is the composite of characteristics that have significance and make for acceptability. The demand for the food quality has been increased within the past decade other than the demand for the basic commodity.

The quality attributes of food products can be analyzed effectively along three dimensions. Those are namely intrinsic or extrinsic, information environment and vertically or horizontally differentiation. Intrinsic/extrinsic is defined as quality and quality perception influenced by attributes that are intrinsic to the product (e.g., nutritional content) or by quality indicators and cues that are extrinsic to the product (e.g., brand name). The information environment is the information on the product quality itself such as search nature (the buyer can judge quality by evaluating the product prior to purchase, e.g., color), experience nature (the buyer must use the product in order to evaluate the quality, e.g., taste), or credence nature (the buyer cannot judge product quality even after purchase and use, e.g., pesticide residues). Vertically/horizontally differentiated is the quality vertically (buyers all share the same quality ranking) or horizontally (buyers have different quality rankings) differentiated (Caswell, 1998):

In this study main attention has been given for the dimension of the intrinsic food quality attributes. The different intrinsic attributes are described in the Table 1.

The consumer analyzing the quality of different products are based on different criteria. For instance some buyers who purchase Genetically Modified (GM) foods care first and foremost about the use of biotechnology and accept or reject products on the basis of this intrinsic process attribute. Other buyers care about the presence of GM food but also care

about other quality attributes such as environmental impact, nutritional quality, and convenience of use. They will make tradeoffs, particularly if safety is assured, between GM status and other desirable attributes associated with that status. (Caswell, 1998). As the GM food, milk can be defined as high quality responsive beverage because it can be lead to cause for many illnesses.

**Table 1 - Intrinsic food quality attributes:**

Quality attribute	Component
Food safety	Food borne pathogen
	Heavy metal
	Pesticides residues
	Food additives
	Naturally occurring toxins
Nutritional	Vet nary residues
	Calories
	Fat & cholesterol
	Sodium & mineral
	Carbohydrates & fiber
	Protein
Value	Vitamins
	Purity
	Compositional integrity
	Appearance
	Taste
Package	Convenience
	Size/style
	Package material
	Other information
	Labeling

Source: Caswell (1998).

Fresh milk is the second beverage that use heavily all over the world after water. When considering Sri Lanka fresh milk consuming is not much significant because most of the people use to consume full cream milk powder (63 percent). But fresh milk consumption is about 1 percent of the overall milk consumption of Sri Lanka. It is worth about US \$ 2.83 million (DCS, 2002). Sri Lankan milk production as well as the milk consumption has been increased over the last few years. The Table 2 shows

the production and consumption of fresh milk in Sri Lanka for the last five years.

**Table 2 - Fresh milk production and consumption of Sri Lanka (1999-2003):**

Year	Production (00000'l)	Consumption (Kg/Year/Head)
1999	126.42	3.59
2000	127.64	3.58
2001	129.02	3.54
2002	129.09	3.68
2003	132.22	4.14

Source: Census and Statistics (2003)

The most difficult task is to maintain the good quality of the milk continuously from the production to consumption. In this instance the packaging plays a major role. There are different types of packaging materials available in the food processing industry such as metal cans, glass bottles, paper, paperboards, fiberboards, plastics, which are the conventional types and laminates, restorable pouches, are the modern materials.

Tetra pack is one of the packaging materials, which fulfill all most all of the requirements of a good packaging material, which is coming under the category of laminates. Tetra pack is an aseptic packaging system which has been sterilized prior to fill with sterilized food, resulting a product which is shelf stable for six months. The tetra pack has been made out of three basic materials combined together, resulting a very efficient, safe and lightweight package. Each of this material has a unique function. It is made out of paper (75%) to provide strength and stiffness, polythene (20%) to make the packages liquid tight and provide a barrier to micro-organisms, aluminum foil (5%) to keep out air, light, off-flavours and all the things that can cause food to deteriorate. Fresh milk packages are coming under these laminating packages (excluding plastic bottles or glass containers) are treated with Ultra High Temperature (UHT) treatment. Therefore that is considered as a good and safe packaging material for store fresh milk.

The fresh milk market in Sri Lanka has been categorized mainly by the packaging material of the product. There are conventional packaging materials like glass and plastic bottles as well as the modern packaging materials like Tetra pack. These various types of fresh milk categories have been targeting differently on certain consumer segments. For instance the market has been segmented based on geographic, demographics, geo-demographic, psychographics and behaviour. These market segments are targeted with different types of targeting techniques. Most of the fresh milk marketing companies practice undifferentiated targeting because milk is a basic commodity. In this study the tetra packed fresh milk is examined by giving strong emphasize on the consumer attitudes towards quality attributes. Therefore milk marketing companies can target their products in most differentiated way by serving the various consumer groups, which are having different quality perceptions.

This study aims to find out the consumer attitudes on the food quality attributes which helps to trace the opportunities and potentials of the milk

marketing in Sri Lanka, and it try to find out the compatibility of the demographic segmentation and the quality perception of the fresh milk consumers.

## METHODS

This section presents the methods use to analyze the situation and it first describes the theoretical framework, data collection and data analysis. The study was methodically developed to hypothesize that the consumer quality perception is associated with their demographic and economic characteristics. The perception of consumers, is difficult to measure, therefore a Food Quality Responsive Index (FQRI) was developed to reflect the perception.

$$FQRI = \frac{\text{The Mean Value of quality attributes}}{\text{The Maximum Potential Mean value}} \quad (1)$$

The mean value of quality attribute, which is described in equation (1), is calculated by adding individual values of each attribute (see Table 1) together and dividing it by four. The maximum potential mean value was assumed as five according to the scale.

The empirical model was constructed to find out the relationship between the consumer perception on food quality attributes and their demographic and economic factors.

$$Y = \alpha_1 + \alpha_2 \text{ GEN} + \alpha_3 \text{ AGE} + \alpha_4 \text{ HH} + \alpha_5 \text{ MS} + \alpha_6 \text{ EDU} + \alpha_7 \text{ HI} + \epsilon \quad (2)$$

The dependent variable (Y) is the values derived from the FQRI, and the variables are gender (GEN), age (AGE; < 35years & 35years<), household size (HH; < 4 members & 4members<), marital status (MS), education (EDU; Secondary< & <Secondary), household income (HI; < Rs.20,000 & Rs.20,000<).

## Data Collection

The next step of the analysis was to collect data from a representative sample of consumers in order to validate the hypothesis. A questionnaire based survey was conducted with sample of 100 randomly selected consumers to reflect various socio-economic characteristics from April to May 2005. It was pre tested prior the real survey with a small sample of potential consumers (n=10) and minor modifications were done to the preliminary questionnaire. The main survey was carried out in supermarkets, groceries and milk bars at the areas in Negombo, Ja-ela and Seeduwa in the Gampaha district.

Psychometric "Likert scale" (Oppenheim,1992) is used to measure the importance of each quality attribute of each consumer. Likert scale is an undimensional scaling method which is used to measure attitudes, preferences & subjective reactions of consumers. Therefore to develop the index of consumer quality responsiveness the respondents were asked to score each component in each quality attribute (Table 1) on a five- point scale in which "most important" are placed at one extreme and "most unimportant" at the other.

Table 3 - Ordered dependent variables of FQRI:

Dependent Variable	Degree of Quality responsiveness	Scale of the Index		No of Consumers	Percentage (%)
		Lower limit	Upper limit		
1	Strongly irrespective	0.22	0.35	22	38.6
2	Irrespective	0.36	0.48	28	49
3	Somewhat respective	0.49	0.62	3	6
4	Respective	0.63	0.76	2	3.5
5	Strongly respective	0.77	1.0	2	3.5

**Data Analysis**

This described the ways and means of the statistical analysis of the collected data. Ordered logistic regression (OLR) model was used to find the relationship of the FQRI and the different demographic and economical factors of the individual consumers. This statistical model was used because the dependent variable is having a categorical data of different quality responsive levels.

**RESULTS AND DISCUSSION**

**Descriptive Statistics of FQRI**

The Figure 1 described the normal distribution of the FQRI. The distribution of FQRI amongst the consumers ranged from the 0.22 (the lowest) to 1.0 (the highest) with a mean of 0.39 and Standard Deviation of 0.12. The distribution was right skewed with the value of 1.98.

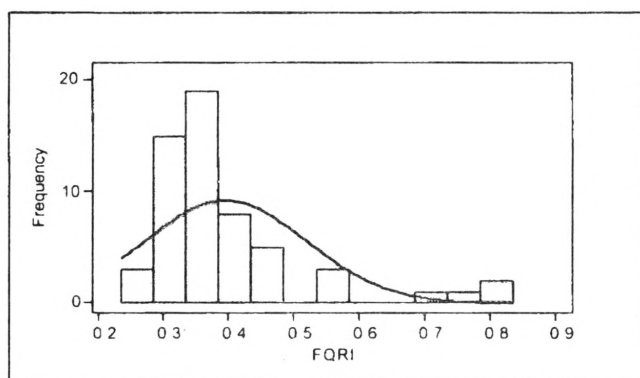


Figure 1-Distribution of FQRI values

Next, five ordered dependent variables ( $D_i=1$  to 5) were developed for the purpose of the OLR analysis using the “lower” and “upper” limits for the FQRI (Table 3).The consumers in the higher category is more food quality responsive than the consumers included in a lower category.

This study surveyed the consumer’s preference on willingness to pay for the tetra packed fresh milk. There were fifty seven percent of consumers willing to pay for the tetra pack fresh milk. From that 57 percent, most of consumers were in the age category of 35 years to 50 years and most of elderly people were reluctant to pay a premium. Most of the consumers having secondary education were willing to pay for the milk.

The Figure 2 presents the different premiums that preferred to pay by the consumers.

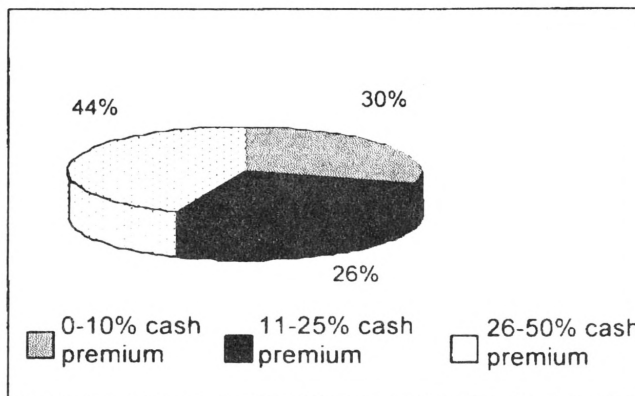


Figure 2 - Different cash premiums preferred by the consumers to pay for the tetra packed milk

The most of the consumers were willing to pay 26 percent to 50 percent price premium for tetra packed milk and there were no any consumers who are willing to pay more than 50 percent premium. The consumers perceived different food quality attributes in different degrees. The Figure 3 describes the different mean values of each food quality attribute.

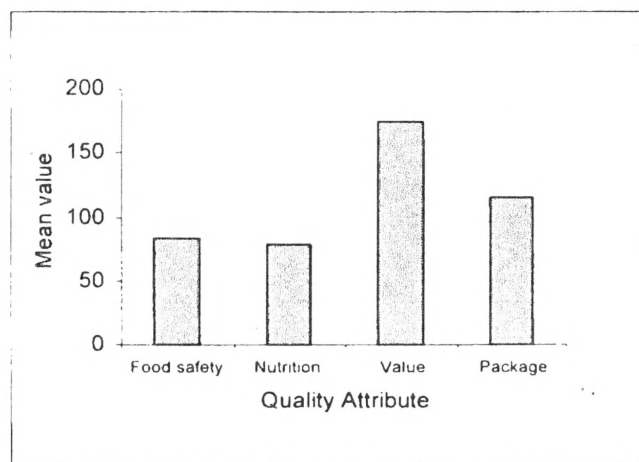


Figure - 3 Total means values of each quality attribute:

It emphasized most of the people were concerned about the value attribute than other three attributes namely food safety, nutrition and packaging. The least importance was the food safety and the nutrition attribute. Consumers perceived the tetra packed milk, which has already consisted with the standard food safety measures and the appropriate nutrition levels.

**Estimates of the FQRI**

The Table 4 describes the estimates, Standard errors and the significant levels of the different parameters of the empirical model (2).

**Table 4 - Results for the logistic regression for the model:**

Variables	Estimate	Std.Error	Significances
D=1	3.3153	1.2218	0.0067*
D=2	8.5122	1.8146	<.0001*
D=3	9.2380	1.8650	<.0001*
D=4	10.0140	1.9471	<.0001*
GEN	-5.7311	1.3192	<.0001*
AGE	-0.2439	0.7665	0.7504
HH	-1.3715	0.8377	0.1016
MS	-1.4183	0.9695	0.1435
EDU	-0.1460	0.7786	0.8512
HI	0.5010	0.7176	0.4850

Notes: \* denote statistical significance at 5% levels

The model was significant with the likelihood ratio of <0.0001. One independent variable namely gender was significant at probability of 0.05. It indicated that there is a difference in male and female on the perception of quality of the food items.

### CONCLUSIONS

This study develops an index to measure the food quality perception of consumers. It is emphasized more on the relationship of the consumer's demographic and economic factors and their quality perception. This helps to develop policies and new product designs, which are most suitable for the quality aspects of the consumers. Apart from that the fresh milk marketing companies can modify their targeting strategies from undifferentiated to differentiate which will enable them to provide a better service and earn an outstanding profit. Consumers perceived tetra pack as a safe and nutritional product while concerning more on value attributes like purity, appearance, taste and convenience and package attributes. Therefore the marketing companies should position their product by giving more attention to the value and the package attributes.

The study doesn't give a weighted value to the each quality attribute (see Table 1) and it was a shortcoming of the study. A further study can be carried out with giving an each attribute a weight and

it will give a more clear description of the quality perception of consumers.

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