Factors Influencing Sri Lankan Consumer's Decisions to Purchase Fresh Milk

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ABSTRACT: The study investigates Sri Lankan consumers' behaviour in relation to the purchase of fresh milk and the factors affecting their purchase decisions. A total 391 households from all nine provinces in Sri Lanka were surveyed with a structured questionnaire. Descriptive analysis, factor analysis and logistic regression were carried out to fulfil the objectives. The results reveal that a consumer's decision to purchase fresh milk is significantly and positively influenced by his or her perception of its sensory attributes (the taste and smell of fresh milk), and that consumers are motivated by health and convenience factors and negatively influenced by advertising. Furthermore, about socio-economic factors the results show married consumer who has less household size, high household income, and high education level is more likely to purchase fresh. The results of this study give some useful information to marketers for their marketing strategies, as well as to the Sri Lankan government to enable it to take suitable steps to improve and enhance the fresh milk industry in Sri Lanka.

Keywords: purchase decision, fresh milk, Sri Lanka

Introduction

Milk is a balanced food. It consists of various types of nutrients such as protein, calcium, phosphorus and vitamins. Drinking milk is a good habit for humans at every stage in their life, but this is especially true for women, children and young people (Unal and Besler, 2006). The milk, or dairy, sector is a sub-sector of the livestock sector in Sri Lanka, and has increased in importance because of high demand and the advent of an open economy (Nanayakkara, 2013). In the 1970s the Sri Lankan dairy sector met about 80 per cent of the local demand for milk. Currently, the local production of fresh milk in Sri Lanka can meet only 33 per cent of the demand; the other 67 per cent is met by imported milk, mainly in the form of powdered milk. Powdered milk worth around US$ 300 million is imported each year from Australia and New Zealand (Central Bank of Sri Lanka, 2016). There is a high demand for imported powdered milk since local fresh milk is more expensive than powdered milk. Therefore, consumers are in the habit of drinking powdered milk in their daily life, and this is shown in the reducing trend in fresh milk consumption (Kodithuwakku, 2008). It is therefore essential to promote domestic fresh milk to improve the dairy industry in Sri Lanka and develop the economy.

In order for the fresh milk market to be enlarged and successfully developed, it is important to become aware of the factors influencing the decision to purchase fresh milk.

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Therefore, this research concentrates on studying the influence of various factors that affect consumers when purchasing fresh milk, in order to improve their consumption, as well as factors that prevent consumers from purchasing or consumption.

The conceptual model

The research attempts to model customer purchasing behaviour by considering the factors that are assumed to affect this behaviour. The model is created using the major factors affecting consumer purchasing behaviour that were proposed by Kotler and Armstrong (2010), namely cultural, social, personal and psychological factors. Moreover, the conceptual model is developed from a literature review on the behaviour of fresh milk consumers that covers a number of scientific studies and pieces of research. Kumar and Babu (2014) revealed that product quality, availability, pricing and advertisement were the top reasons given by Pondicherry state consumers for purchasing milk. De Alwis et al. (2011) examined the determinants of the purchase of fresh milk among Sri Lankan consumers and revealed that taste, nutrition, availability, age, ethnic group, education, household size, income, health and price were all factors that affected consumers' buying behaviour in relation to fresh milk. In similar results, Boniface and Umberger (2012) identified nutrition, age and ethnicity as the most important reasons behind Malaysian consumers' consumption of dairy products. Then Senadisai et al. (2014) found health to be the main motivational factor influencing milk consumption. Furthermore, several studies have shown that the consumption of fresh milk is partly affected by availability, health concerns and hygiene conditions. In addition, lifestyle factors have also influenced the habitual food choices of consumers, and some other studies have demonstrated that factors such as gender, age, education, occupational status and ethnicity may influence food selection behaviours and the attitudes and beliefs on which they depend (Bus and Worsley, 2003; Wham and Worsley, 2003).

The developed conceptual model is illustrated in **Figure 1**. It shows the impact of cultural, social, personal and psychological factors on milk purchase decisions. The research has identified that the above four types of factor are independent variables and the purchase of fresh milk is the dependent variable.

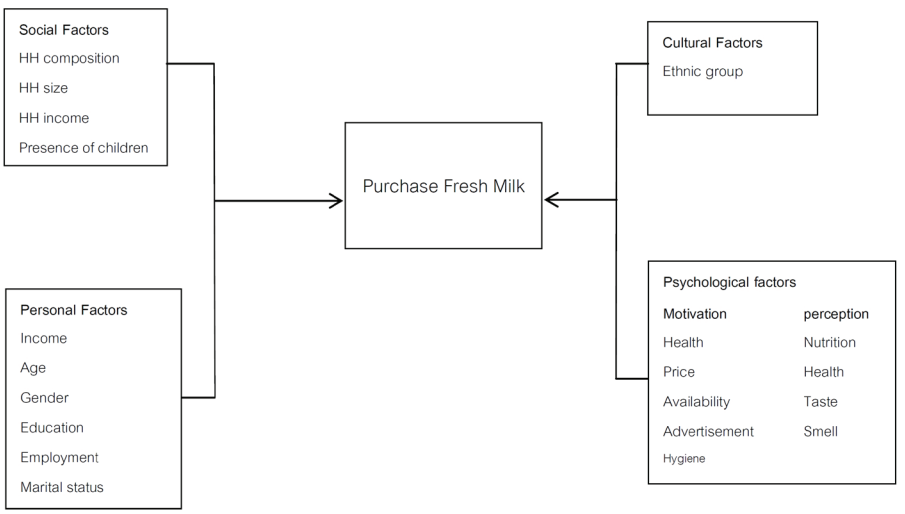

Figure 1 Conceptual model

Materials and Methods

Survey design

The target population in this research are the people who take responsibility for purchasing food for households in Sri Lanka, who may or may not buy fresh milk. In this study, the research area is based on the geographical location of the consumer. Administratively, Sri Lanka is divided into nine provinces, and each province has a capital city. These capital cities of the nine provinces were used to collect the data. The convenience sampling method was used to select respondents in the location of each capital city at supermarkets and milk retail outlets. The sample size for the research was calculated for a large and known population ratio using Yamane's (1973) formula. The number of respondents for each province was calculated according to the proportion of the total population in that province, and it is shown in **Table 1**. Data were collected from a total of 400 respondents using a face to face interview method between 15 December 2016 and 31 January 2017. In all, 391 questionnaires were completed and taken for analysis, giving a response rate of 97.75 per cent.

Table 1 Sample size in each province

Province	Provincial Capital City	Number of Households	Percentage of Households	No. of Sample Size
Uva	Badulla	326,358	6.29	25
North Central	Anuradhapura	339,324	6.54	26
Northern	Jaffna	251,649	4.85	19
Central	Kandy	645,807	12.44	50
Sabaragamuwa	Rathapura	502,209	9.67	39
Southern	Galle	629,114	12.12	48
North Western	Kurunegala	639,393	12.32	49
Eastern	Trincomalee	391,103	7.53	30
Western	Colombo	1,466,488	28.25	113
Total		5,191,445	100.00	400

Questionnaire design

The main survey instrument in this research is a structured questionnaire, which was developed based on the literature review and a focus group interview. A focus group discussion was held with a group with six people who are the main purchasers of dairy products for their households and are engaged in the livestock sector. The discussion was designed to gather information from the participants in regard to the various questions about consumer behaviour in relation to fresh milk consumption. The questionnaire was given to a panel of experts and some modifications were made to the original questions.

The complete questionnaire was divided into four sections. In section 1, data was collected regarding the respondents' socio-economic characteristics and their purchasing decisions with regard to fresh milk. Questions about their fresh milk consumption behaviour were contained in section 2. Information regarding their perception of fresh milk (its nutrition, effects on health, taste and smell) was collected in section 3, and section 4 asked the respondents to rate their motivation in respect of health, availability, advertisement, price and hygiene. The respondents were asked to indicate their level of agreement on a 5 point Likert rating scale.

Statistical Analysis

Binary logistic regression was used to find out the respective relationships between the decision to purchase fresh milk (Y_i) and the

independent variables (x_i), which included the respondent's cultural (ethnic group), social (household size, household composition, household income and presence of children) and personal (income, age, gender and education) characteristics and their perception and motivation.

$$P_i(Y_i = 1) = \frac{1}{1 + e^{-\beta x_i}}$$

$$log\left(\frac{P_i}{1 - P_i}\right) = \beta x_i$$

For the perception and motivation questions, the questionnaire provided a multidimensional measure. Exploratory factor analysis was used to condense the large number of responses from the consumers to the items about their general perceptions related to health, nutrition and motivation for fresh milk consumption into the smallest set of factors while maintaining the highest amount of information.

Factor analysis

The results of the principal component factor analysis in relation to perceptions about the purchase of fresh milk are presented in **Table 2**. For consumers' perceptions about fresh milk, the principal component extraction and varimax rotation resulted in two factors (KMO score = 0.877 and Bartlett's test < 0.01). The factor loading for ten of the proposed items was above 0.5, but for one item in the sensory factors it was below 0.5 and therefore this item was removed. Furthermore, all the communalities extraction scores were loaded from 0.5 to 0.7 (where more than 0.5 is desirable) (Hair et al., 2008).

Table 2 Results of principal component factor analysis for consumers' perception

Statements	VARIMAX Rotated Loading		Communalities
	F1	F2	
Factor 1. Nutrition			
1.Fresh milk is nutritious	.807		.663
2.Drinking fresh milk make me healthy	.775		.718
3.Fresh milk contain a lot of protein, calcium, vitamins and minerals	.758		.593
4.Fresh milk is good for my skin, teeth and hair	.754		.685
5.Fresh milk is healthy drink	.741		.640
6.Nutritional quality of fresh milk is much higher than milk powder	.686		.512
Factor 2. Sensory			
1.Fresh milk has nice smell		.820	.666
2.Fresh milk taste is good		.814	.777
3.Fresh milk is more tastier than other processed milk products		.806	.666
4.Taste is very important when buying fresh milk		.784	.715
Eigen Value	5.243	1.439	
Variance explained (%)	52.427	14.386	
Cumulative variance (%)	52.427	66.813	
Cronbach's Alpha	0.879	0.858	

For consumers' motivation for purchasing fresh milk, the principal component extraction and varimax rotation resulted in four factors (KMO score = 0.827 and Bartlett's test < 0.01). Statements with a factor loading and communalities extraction score of above 0.5 were retained (0.5-0.7). Finally, four factors, with a total of 13 statements, were retained. The factor analysis of the motivation to purchase fresh milk is shown in **Table 3**.

Table 3 Results of principal component factor analysis for consumers' motivation

Statements	VARIMAX Rotated Loading				Communalities
	F1	F2	F3	F4	
Factor 1. Health and Convenience					
1.Drinking milk helps to keep bones strong and to prevent osteoporosis is influence me to buy fresh milk	.830				.784
2.Milk is great source for bone development of kids persuade me to buy it	.808				.755
3.The ability of milk for strengthen the teeth and prevent tooth decay and cavities drive me to buy fresh milk	.764				.741
4.It is easy to find fresh milk for me	.673				.510
5.High availability of fresh milk motivate me for higher consumption	.594				.634
Factor 2. Advertising					
1.Advertising convince me to buy the advertised product		.870			.783
2.The message on advertisement attempts to persuade me to buy fresh milk		.831			.788
3.Advertising influence me when decision to purchase milk		.780			.678
Factor 3. Hygiene					
1.I think if practice good hygiene during milking fresh milk remains fresh long time			.803		.719
2.I think unhygienic fresh milk production cause spoilage due to bacteria and germs			.716		.579
3.I think fresh milk with good hygiene influence me to buy fresh milk			.647		.637
Factor 4. Price					
1.Fresh milk is expensive and this may be barrier to milk consumption				.837	.759
2.I will buy fresh milk more if reduce the price				.758	.684
Eigen Value	4.847	1.798	1.402	1.003	
Variance explained (%)	37.283	13.830	10.788	7.716	
Cumulative variance (%)	37.283	51.113	61.901	69.617	
Cronbach's Alpha	0.806	0.813	0.748	0.631	

Table 4 Description of variables in binary logistic regression for consumers' decisions to purchase fresh milk

Variable	Variable Name	Description	Scale
Dependent (Y)			
Purchasing fresh Milk	PURCHASE	1=if purchase fresh milk; 0=otherwise	Nominal
Independent (X)			
Ethnic Group	ETH	1=if respondent is Sinhalese; 0=otherwise (Tamil, Muslim)	Nominal
Household Size	SIZE	Number of members in the family	Scale
Household Income	HINC	1=if monthly household income more than 45,000Rs; 0=otherwise	Ordinal
Personal Income	INC	1=if personal income more than 30,000Rs.; 0=Otherwise	Ordinal
Presence of Children	CHILD	1=if household has children; 0=otherwise	Nominal
Older People	OLDER	1=if household have member more than 60 years; 0=otherwise	Nominal
Age	AGE	Age of respondents in years	Scale
Gender	GEN	1=if respondent is female; 0=male	Nominal
Education	EDU1	1=if respondent has below primary education(Not go to School, Up to grade 5); 0=otherwise	Ordinal
	EDU2	1=if respondent has up to secondary education (Up to O/L and Up to A/L); 0=otherwise	Ordinal
	EDU3*	1=If respondents have tertiary education(Diploma, Graduate, Post graduate); 0=otherwise	Ordinal
Employment	EMP	1=if respondent has employment; 0=otherwise	Ordinal
Marital Status	MS	1=if respondent married; 0= otherwise(Single, Widowed, Divorced, Separated)	Ordinal
Health and Convenience	M1HC	Perception about health factors of fresh milk (Mean score)	5 Point Scale
Advertisement	M2AD	Motivation about awareness of advertisement (Mean score)	5 Point Scale
Hygiene	M3HY	Motivation about hygiene of fresh milk (Mean score)	5 Point Scale
Price	M4PR	Motivation about price of fresh milk (Mean score)	5 Point Scale
Nutrition	P1NUT	Perception about nutrition of fresh milk (Mean score)	5 Point Scale
Sensory	P2SEN	Perception about sensory factors of fresh milk (Mean score)	5 Point Scale

Notes: *Indicates the reference category, which was dropped from the models to avoid perfect collinearity.

Results and Discussion

Descriptive Analysis

The socio-demographic profile showed that more of the consumers in the sample were female (54.5%). The 38.6% of consumers were aged between 16 and 29 years. Most consumers were Sinhalese (85.7%), and the majority of the respondents had completed their education up to Advanced Level (these accounted for 35%). When considering occupation, the highest number of consumers were government employees (52.9%). In terms of the total personal monthly income of the consumers, the 36.8% of consumers received 30,001-40,000Rs per month. A high proportion of the consumers were married (66.2%). When the number of people living in the respondent's household was examined, a majority (77.7%) of the consumers were found to live in families with between three and five people. In around half of the households there were children in the family, and the majority of these children (33.6%) were aged between two and six. In 31.5% of households there was household's member aged over 60. In terms of total household income per month, the majority (27.6%) of the families received 45,001-60,000Rs. The proportion of consumers who drank fresh milk was 82.9%, and 17.1% of them did not drink fresh milk.

Factors affecting consumer's purchase behaviour

A binary logit model was calculated to identify the factors affecting behaviour in relation to the purchase of fresh milk. The results of the binary logit analysis are exhibited in **Table 5** (Model 4). The Hosmer-Lemeshow test was used to evaluate the goodness-of-fit of the model (Hosmer and Lemeshow, 2000). The overall model was statistically significant, with a P value < 0.05 and the Hosmer-Lemeshow chi-squared of 13.29. This means that the model of a consumer's purchase decision about fresh milk fits well with the data, which is explained below.

Socio-economic factors

A Consumer's decision to purchase fresh milk is positively and significantly affected by marital status (at the 0.1 level) and household income (at the 0.05 level), and negatively affected by education (EDU1 at the 0.05 level and EDU2 at the 0.1 level) and household size.

The results show that increased household income is associated with an increasing probability of fresh milk consumption. Many other researchers have shown that income is an important factor when deciding about the purchase of fresh milk (Celik Ates and Ceylan, 2010; De Alwis et al., 2011). Moreover, marital status has a significant and positive impact on fresh milk purchase behaviour: married people are more likely to purchase fresh milk than single people.

Consumers' education (EDU1 and EDU2) show that a decrease in education level is associated with a decreased probability of consuming fresh milk. This implies that consumers with only a secondary education are less likely to consume fresh milk. On the other hand, consumers with a high education level are more likely to purchase fresh milk. This outcome is consistent with previous research by Raunikar and Huang (1984) and Gunden et al. (2001). In addition, the results reveal that the probability of fresh milk consumption decreases with household size.

Psychological factors

The results of the study for psychological factors show a significant (0.01 level) positive relationship between consumers' purchase decision, the sensory factors and the health and convenience factor, while there is a significant (0.01 level) negative relationship with advertising. This means that sensory factors such as the taste and smell of fresh milk play a vital role and have a significant impact on consumers' decisions at the time of purchase. Teratanavat and Hooker (2006) also mentioned that even if consumers are concerned about health benefits they still evaluate

other factors, such as their perception of taste, naturalness and appearance. Furthermore, according to Bus and Worsley (2003), taste is a major determinant of food choice; they found that more than 73% of consumers had a positive attitude towards the taste of milk.

The findings also suggest that health benefits and convenience are the key factors considered by consumers when making a decision to buy fresh milk. Many researchers emphasize the vital role of dairy products in sustaining health and reducing the risk of health problems (Heaney 2000; McGill et al., 2008; Wang et al., 2008). Whether fresh milk was available near to the house or conveniently, and whether it was easily available for purchase, were other factors that were considered by the consumers to be relatively important. This finding suggests that Sri Lankan consumers are well aware of the health benefits gained from consuming dairy products, and this awareness is having a positive impact on their consumption of fresh milk. De Alwis et al. (2011) and Nagyova et al. (2006) also mentioned that higher availability or convenience is an important factor that strongly affects consumers' decisions.

From the results of this study, we can say that there is a negative impact of advertising on milk purchasing behaviour. Our results emphasize that advertising does not play a positive role in changing purchasing habits. This result also suggests that fresh milk consumers are not positively affected by advertisements for milk (Kilic et al., 2009).

Table 5 Results of the binary logit analysis of the factors affecting consumers' purchase decisions

Variable	Description	Coefficients			
		Model 1 Socio-Economic Factors	Model 2 Psychological factors	Model 3 Socio-Economic and Psychological factors	Model 4 Significant factors
AGE	Age	0.00170		-0.02035	
ETH	Ethnic	0.67916**		-0.13706	
EDU1	Primary Education	-2.04244***		-0.1.84668**	-1.82620**
EDU2	Secondary education	-0.23903		-0.69733*	-0.65637*
EMP	Employment	-0.02981		-0.57361	
INC	Personal Income	-0.05121		-0.26493	
MS	Marital Status	0.84287**		0.86654*	0.56156*
SIZE	House hold size	0.19335*		-0.26446*	-0.23329*
CHILD	Children	-0.16604		-0.13097	
OLDER	Older people	-0.05471		0.05674	
HINC	House hold income	0.58368*		0.84692**	0.64467*
P1NUT	Nutrition		0.02841	0.09794	
P2SEN	Sensory		0.97136***	0.99149***	1.04875***
M1HC	Health and convenience		0.91161***	0.97048***	1.10641***
M2AD	Advertisement		-1.59303***	-1.54497***	-1.51746***
M3HY	Hygiene		0.27667	0.38859	
M4PR	Price		-0.19819	0.01634	
Hosmer-lemeshow chi-squared		17.57624	5.16261	13.29229	11.09803
McFadden Pseudo R-squared		0.08280	0.25305	0.30441	0.28671
P-Value		0.02464	0.52313	0.02079	0.08539

Note: ***, **, * means there are significance at 1%, 5%, 10% level

Conclusions

The findings suggest that strategies for increasing fresh milk consumption in the domestic market will be more successful if they focus on consumers who are married, who have a high level of education, who have a high household income and who have a small household size.

Moreover, the taste, smell and health benefits of fresh milk encourage consumers to purchase fresh milk. Thus, milk processors

should consider the influential factors such as the nutritional quality, the health benefits and the sensory attributes of fresh milk. As a policy implication, the government could introduce health educational programmes such as a school milk programme to improve the awareness of the health benefits of milk among primary and secondary level students. Further, our findings imply that convenient locations of shops and good availability of fresh milk are significant for increasing the number of milk consumers.

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