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Analysis of Consumer Perceptions for Purchase Decision Making on Fruit Beverages in Sri Lankan Supermarkets

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Abstract: ***Sri Lanka is currently being operated by four leading supermarket chains. These supermarkets provide four major fruit beverage categories of Ready to Drink (RTD) fruit beverages, fruit nectar, fruit cordial and fruit concentrates. This study was conducted at the Colombo city, commercial capital of Sri Lanka to identify the consumer perceptions that drives the purchasing decisions of consumers on fruit beverages. A survey included in the study identified fruit nectar as the most preferred fruit beverage category. The attributes that drives the consumer perception are calculated using discrete choice model, choice based conjoint analysis. Among them "Brand name", "Flavour", "Volume", "Price" and "Sugar levels" have 34%, 20%, 20%, 21% and 4% aggregated importance respectively. Well-known brand names have higher consumer preference and consumers are more likely to consumer mango nectar. Also, consumers prefer nectar at the affordable middle level price range. Factor analysis was conducted to identify the major factor that drives the market and a cluster analysis was conducted to divide the sample population in to four segments. Four factors focused on consumer behavioural segmentation were identified within the study from the factor analysis. They are "Information seeking factor", "Neophile factor", "Convenience factor" and" Health conscious factor".***

Keywords: Fruit beverages, Choice based conjoint analysis, Factor-cluster segmentation, Descriptive analysis

Objectives

- To identify the most preferred fruit beverage category.
- To identify the product attributes that consumers consider as important when making the purchase decision in the selected fruit beverage category.
- To determine the most preferred product attributes of the selected fruit beverage category.
- To identify major marketing segments among the shoppers in supermarkets.

1. Introduction

Consumers have initiated a trend to purchase fruit beverages over the carbonated beverages as fruit beverages are perceived as healthier. The fruit juice segment is expected to witness increased demand levels in both value and volume terms as the overall market return in majority of Asian and Latin American countries [1]. Technavio's analysts forecast the global fruit and vegetable mixed juices market to grow at a cargo annual growth rate of 3.24% during the period 2016-2020 [2]. As a South Asian country, this fast-growing market has also affected Sri Lanka [3]. However, some of the fruit beverage categories show higher demand with respect to the others as they are aligned as more beneficial with the consumer perceptions. Also, consumers develop higher psychological ownership towards the product they select to purchase [4]. Identification of these consumer perceptions that drives the purchasing decisions is beneficial for adaptation of new marketing strategies and to increase the sales.

Colombo city is the commercial capital of Sri Lanka where a major proportion of the supermarkets are established. Surveys can be used as qualitative and quantitative research methods of identifying the consumer perceptions. A study was conducted to identify consumer patronage and risk perceptions in internet shopping and a similar study was conducted to identify attitudes of Swedish consumers towards organic foods using survey techniques [5] [6].

Choice based conjoint analysis is a discrete choice method that is used in calculating the relative importance of the selected attributes of a product including the partworth utilities of selected attributes. It has received considerable academic and industrial exposure for years as it has been used as a validated method [7] for measuring buyers' trade-offs among multi-attributed products and services [8] [9] [10] [11], including foods [12] [13]. This technique is often used in marketing research to identify consumers' preferences. A study was conducted on Swedish consumers in 2001 to identify benefits of labels and bans on genetically modified foods using the choice experiments [14] In 2005, a study was conducted to identify the product design attributes for a range of chilled probiotic orange juice beverages. This study has used the product attributes such as brand, type of juice, texture, flavour, health benefits and price for the conjoint analysis [15]. A research study was conducted to identify the reason behind the demand for locally grown food by using the discrete choice model in 2008 [16]. Discrete choice model was applied in

wine industry. In 2010, it was applied to determine the quality perception of wine [17]. Then it was again applied to identify the consumer's willingness to pay for the wines with no sulphite [18]. Therefore, discrete choice model has the versatility to be applied in the different situations to identify the consumer perceptions.

Suzanne Donner claims that correct customer segmentation is an effective, lower cost and stronger accessible method for more profitable market penetration [19]. At present, the bases of customer segmentation are demographic, lifestyle, interests, behaviour, and customer value variables. Factor cluster analysis model is used to identify new market segments. It is useful to understand the factors that drives the consumer expectations as a whole and the contribution such factors provide to the selected market segments. A case study was conducted to identify the "Benefit sought" market segments for soft drinks in Kosova Market [20] using the factor and cluster analysis methods. Similar study was conducted targeting the dining out culture in typical American consumers [21].

2. Methodology

A questionnaire was developed to identify the most preferred fruit beverage category and the main reasons to prefer and purchase the specific fruit beverage category. The pre-tested questionnaire was distributed to randomly select 300 consumers who were shopping in all 46 supermarkets located in Colombo city limits. Survey tool was prepared in Sinhala (local) language. It was conducted on day (9:00 am to 6:00 pm) - and night (6:00 pm to 8:00 pm) during the weekdays and weekends to reduce the sampling error. This was conducted in a manner to represent all possible consumers and to obtain a well-represented sample of the population. Respondents were allowed to answer the questionnaire by themselves.

Structured interviews were conducted with the supermarket management in 20 selected supermarkets to reconfirm the answers obtained from the initial survey. Interviews were conducted in Sinhala language and recorded using a recording application in smartphone. The important aspects of the survey 1 were descriptively evaluated using charts in the Microsoft Office Excel 2016.

Based on the results of the initial survey, another questionnaire was developed in the Sinhala language to capture consumer perceptions regarding the consumption of the most preferred fruit beverage category. Random statements that aimed at behavioural market segmentation and a few questions to obtain demographic data of the respondents were included in the third and final parts of the questionnaire. This survey was conducted in the same 46 supermarkets during the weekdays and weekends as explained above among randomly selected 300 supermarket customers.

In construction of the second questionnaire from the above mentioned structured interviews and the first survey, only highly significant five attributes namely, brand name, flavour, volume, price and sugar level were considered for the discrete choice method. Each of these attributes was divided into three factor levels as given in Table 1. Choice based conjoint analysis in the questionnaire was designed using the XLSTAT 2016 software. For the designing purpose, attributes and their levels in the table 1 was used. 12 profiles were designed using the optimized fractional factorial design and created profiles were used as 12 comparison including the "I purchase neither" option per each case. Observations were included to obtain relative importance of each attribute and partworth utilities of in each attribute level.

Table 1: Attributes and levels of the choice based conjoint analysis

Attribute	*Levels*
Brand name	Well known Moderately known Unknown
Flavour	Mango Mix Fruit Wood apple
Volume	200ml 500ml 1000ml
Price	High Medium Low
Sugar level	Green sticker Orange sticker Red sticker

Third part of the questionnaire consisted 20 random statements as shown in the table 2 which were aimed to segment the market. Under each statement respondents had to select an answer from 5 options namely "Strongly agree", "Agree", "Neither agree nor disagree", "Disagree" and "Strongly disagree". Factor analysis was performed using SPSS Version 23 software to analyse the answers for the statements. In analysing the data, communalities less than 0.300 were removed from the list as the proportional variance of factors explained by such statements were low. Correlation matrix was analysed by, the principal component data reduction method and extracted based on the Eigenvalue of 1. To obtain uncorrelation among the factors, varimax factor rotation was implemented. Coefficients less than 0.50 were suppressed to have strong correlations. Reliability test (Cronbach's alpha) was applied for all the extracted components. Factors having Cronbach alpha values higher than 0.700 were chosen as significant factors and other factors were removed. Fixed number of factors was set for extraction after the reliability test.

Table 2: Statements for factor analysis

Statement number	*Statement*
Statement 1	I would like to know the ingredients in the food I eat.
Statement 2	I compare the information in the labels before purchasing.
Statement 3	I compare the labels to identify the most nutritious food.
Statement 4	I read the cover to find out about the calorie value of the food.
Statement 5	I can easily identify the price changes in goods that I purchase frequently.
Statement 6	I like to purchase from the supermarkets that give special discounts.
Statement 7	I check the prices of even small items that I purchase
Statement 8	I mostly consume "Ready To Drink", "Ready To Eat" food.
Statement 9	I mostly use the refrigerated food.
Statement 10	I consume mixtures or precooked food.
Statement 11	I don't like to use preservative added food.
Statement 12	I exercise usually.
Statement 13	I frequently eat fruit and vegetables.
Statement 14	I mostly use low sugar food.
Statement 15	I use low amount of salt on food.
Statement 16	I like beverages with medicinal properties.
Statement 17	I use novel products at least once.
Statement 18	I tryout products with new brand names just to find out about them.
Statement 19	I like to accept the challenges I never accepted in my life.
Statement 20	I take at least one meal away from home.

3. Results and discussion

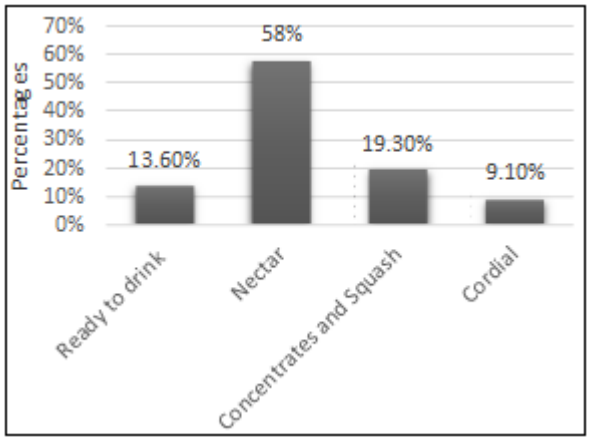

Chart 1: Most preferred fruit beverage category

Here the ready to drink beverages are the fruit beverages that has 13-15% fruit as a percentage of total volume. Nectar has 25% fruit percentage and concentrates have even more. Cordials are fibre-less fruit beverages. Analysis of data to identify most preferred category of fruit beverage revealed that supermarket customers living in Colombo area prefer fruit nectar over other fruit beverage categories. As shown in chart 1, 58% of the respondent's preferred fruit nectar over other categories of fruit beverages. Fruit cordial was identified as the least preferred fruit beverage.

Chart 2 shows the importance and priorities of the attributes for the consumers when making a purchase decision on a fruit beverage. Five product attributes that indicated the highest preferences were included in the choice based conjoint analysis. These attributes included brand name, flavour, volume, price and sugar level. Attribute levels for each were confirmed in the structured interviews with the supermarket management. Structured interviews were conducted in a manner to reconfirm the results obtain from the initial survey. Microsoft Excel 2016 software was used to analyse the data obtained from the second survey descriptively.

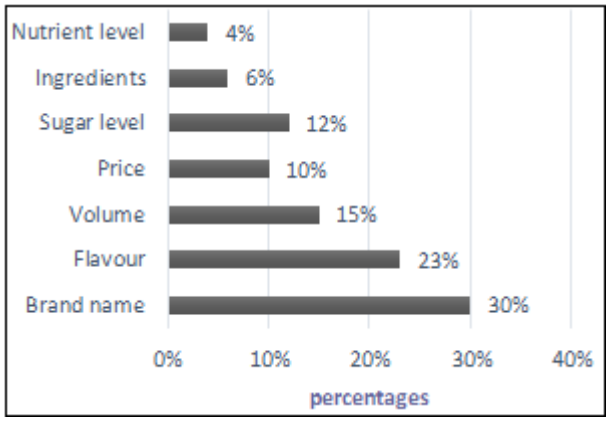

Chart 2: Accepted levels of the attributes

Table 3: Descriptive analysis of the survey 2 data

Question	*Choices*	*Percentages of answer being chosen*
Q1. What is the main reason to repurchase nectar?	Due to flavour of nectar (Mango, wood apple etc.)	32%
	Because nectar is a natural beverage.	30%
	As it can be used without any further processing.	25%
	Just to quench the thirst.	13%
Q2. Where do you consume the nectar most?	At home.	12%
	Outside the home	88%
Q3. How do you check the quality of the nectar before you purchase them?	By its label	49%
	By its brand name	41%
	By colour	8%
	Type of package	2%
Q4. When do you consume nectar mostly?	As an alternative drink when I feel fatigue	76%
	In between main meals	15%
	After attending a sport or inside of the gymnasium	4%
	With main meals	5%
Q5. How frequent do you drink mango nectar?	1-3 times a month	43%
	Lesser than once a month.	33%
	Once a week	14%
	2 -3 times a week	9%

	5 times a week	1%
Q6. What is the most suitable package type for 500 ml nectar?	Tetra pack	71%
	PET bottles	24%
	Metal can	5%
Q7. Do you like nectar with higher shelf life?	No	82%
	Yes	18%
Q8. Me/ my family purchase _____bottle for the consumption of the whole family	1 l	76%
	500 ml	19%
Q9. I mostly purchase _____ bottle of nectar for my own consumption	200 ml	5%
	200 ml	75%
	500 ml	19%
	1 l	6%
Q10. I use nectar _____	With friends	53%
	Alone	32%
	With family members	15%
Q11. Are you more concerned about the issues caused by food packages when you purchase foods?	No	26%
	Yes	74%

Effective response rate for this part of the questionnaire is 100%. Consumers prefer to use nectar mostly due to types of its flavour. Question 1 of the table 3 indicates that 32% of the respondents prefer to repurchase nectar due to availability of different flavours. Next important factor is nectar being a natural beverage (30%) processed from fresh fruits. Convenience of using as a beverage without further processing (25%) also majorly effects consumer perception when making the purchase decisions. Because of the busy lifestyles, many consumers choose to use the convenient products with lesser further processing. Moreover, nectar consumers expect more from nectar than just quenching the thirst. These additional expectancies are the main reasons behind nectar being the highest demanding fruit beverage in the market.

As shown in table 3 question 2, there is a huge gap of people consuming nectar at home and outside the home. 88% of the people use nectar outside the home and only 12% of them use it inside the home. A research study conducted in Sweden has shown that the fruit juice consumption in home is higher than the fruit juice consumption away in adolescents [22].

Majority of the consumers (49%) check the quality of the nectar by reading its label or with the use of brand loyalty (41%) before purchasing nectar. 90% of the consumers who purchase nectar identify the pre-purchase quality by above 2 factors. This indicates several vital information. One is increase of consumer observant abilities when purchasing a product like nectar as they look for the manufacturing date, expiring date including nutrients and calorie values on label before purchasing the nectar products. Also, the consumers perceived quality via the brand name and brand packaging [23]. Only very small amount of people purchases products due to its colour and type of the packaging.

Answers to the forth question revealed that 76% of the consumers purchase nectar when they feel fatigue and 15% in between meals as an alternative beverage to substitute water. Fruit juices including nectar are a rich source of mono- and disaccharides, vitamins, minerals, fibre and small quantities of protein and fat. Sweetened beverages also contain a high content of sugar which can provide instant energy to relieve fatigue [24]. However, most western countries consume fruit juices including nectar with the main meal to satisfy satiety [25].

Of the respondents 43% consume mango nectar for 1-3 times a month and 33% consume it lesser than once a month. It's rare that consumers purchase it 2-3 time or 5 times a week. It's a major drawback of nectar comparing to other carbonated beverages. It can be interpreted that most of the supermarket consumers in Colombo area are not heavy consumers of fruit nectar.

People have chosen tetra packs (71%) over the PET bottles (24%) and the least preferred package types were the metal cans according to table 3 question 6. Consumers are moving towards the green products and they seem to realize the pollution caused by the accumulation of the PET bottles [21]. Tetra packs have seized more consumer preference due to perceived low environmental impact by the packages. Also, it is being considered as a sustainable product over PET bottles [26]. It has a short life cycle comparatively to the one with pet bottles.

More than 80% consumers of the population reject the idea of increasing the shelf life of nectar according to question 7. Consumers are more aware of the negative impacts that cause by the preservatives. Also, consumers prefer more freshness in the food [27]. Most consumers acquire a developed psychology that the preservatives downgrade the freshness of the food.

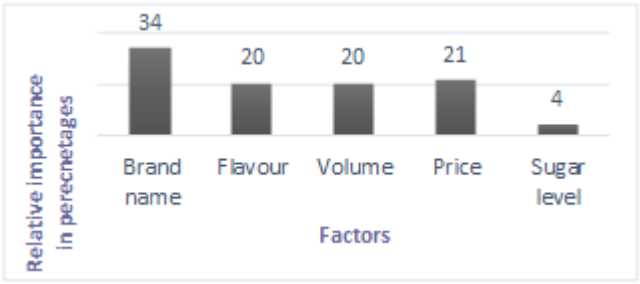

Chart 2: Aggregated importance of attributes

According to the answers of question 9, supermarket consumers prefer 200 ml bottles over 500ml bottles and 1l bottles for individual consumption. 1l bottle has the least preference among individuals as nectar is being used in-between meals to obtain satisfaction against fatigue according to previous observations. Therefore, it can be confirmed that the nectar market can reap higher sales on small volume sizes

than large volume bottles in Colombo city. As mentioned under the question 8, family consumption of the nectar is vice versa to the results of individual consumptions. But rather than using the nectar with the family, people tend to purchase it for themselves or consume it with friends. Only the people consume it with family would purchase 1 litre bottles for their consumption. Of the respondents, a large portion of 53% consume nectar with their friends while 32% consume it alone. Very few percentages of people enjoy fruit nectar with family members. As reconfirmed by the results, peer gathering and peer pressure can affect the purchasing of nectar.

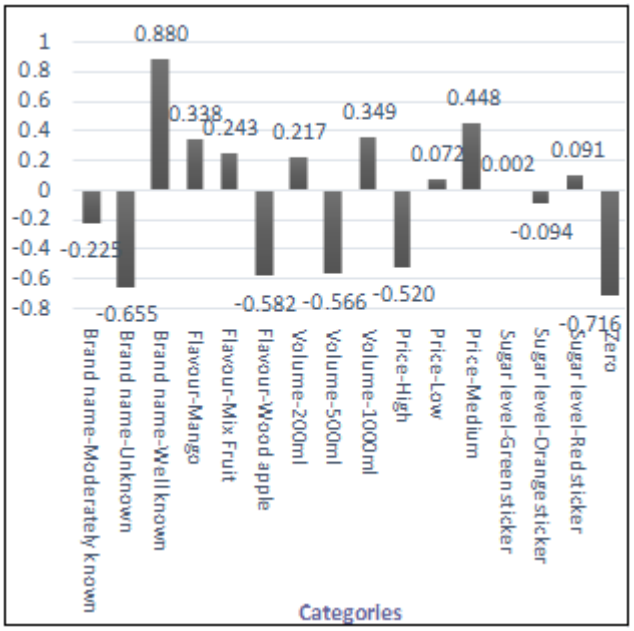

Chart 3: Partworth utilities of attribute levels

Then choice based conjoint analysis was evaluated using the XLSTAT 2016 software. Chart 3 indicates the relative importance of each attribute provided by the conjoint analysis. Effective response rate for this part of the questionnaire was 100%. Brand name has the highest importance of 34% when making the purchase decision to purchase fruit nectar. Flavour, volume and price has similar importance comparatively. Consumers care least about the sugar levels when making a purchase decision compared to the other attributes. It confirms that people show highest importance to brand name, price, flavour, volume, and sugar level in sequence when making a purchasing decision.

Part-worth utilities of the attribute levels were evaluated by the CBC analysis and results are shown in chart 4. Consumer utilize the products with well-known brand name preferably over moderately known and unknown new brand names. Mango flavour is more demanded by consumers over the mixed fruit and wood apple flavours. Consumers have least preference to the wood apple flavour. 1000 ml bottles have the highest overall demand over 200 ml bottles. 500 ml bottles have the lowest impact when making the purchase decision. Comparing with the above results in the table 3, this indicates that the people who consumer nectar with friend and family are relatively high. Shoppers of the supermarkets in Colombo city are not severely price conscious as they prefer middle price range for the nectar they purchase. As majority of the people in Colombo city belong to middle and high income categories, [28] they can easily afford nectar priced at middle level. Considering the health aspects of people, Sri Lankan government has very recently implemented a regulation to lower the sugar intake through sweetened beverages. It is a traffic light colour coding system where green represents the lowest amount of sugar (2%) weight to volume basis, yellow represent mid-range of sugar (2-11%) and red represent high amount of sugar (>11%) in fruit beverages. However, according to the results shown in chart 4 people prefer high sugar containing nectar followed by lowest sugar containing nectar. Least preferred level is the medium level sugar.

Effective response rate for third part of the questionnaire were 96%. After rotation, the results of factor analysis interpret the following facts. The first factor is “Information seeking factor” which contains consumers who seek nutritional information by reading labels to find out about the nutrient values, calorie values and ingredients. This factor contains four statements with the eigenvalue of 3.716. Measurement of the internal consistency of statements showed high reliability with a Cronbach’s alpha value of 0.761. It explains 28.58% of variance of the data set.

The second factor is “Neophile factor”, the desire of the consumers to try new products and brands. It included three statements as it is mentioned under the table 4 factor 2. This factor contributes for 15.12% and Cronbach’s alpha holds 0.790 reliability value for the statements. Convenience foods have acquired a significant marketing demand in most of the markets. The global convenience foods market is expected to grow at a healthy compound annual growth rate from 2014–2020. [29]. Confirming the previous fact, third major factor is “Convenience factor”. It overall explains 11.75% of the variance with the reliability value of 0.740. This factor was accepted by consumers who purchase the most frequently used refrigerated food, precooked food and food mixtures. Forth factor has the least eigenvalue of 1.354 and it explains the variance of 10.42% with a reliability level of 0.707. It emphasized on healthy eating habits and therefore it is named as the “Health conscious factor”. This factor represents higher demand on low sugar, low salt products in supermarkets.

Table 4: Factor analysis data

Factor names	Statement number	Statements	Rotated component matrix values	Eigen value	Cronbach alpha value of factors	KMO value	Bartlett's Test of Sphericity Sig.
Information seeking factor (Factor 1)	Statement 2	I compare the information in the labels before purchasing.	.820	3.716	.761	0.728	0.000
	Statement 3	I compare the labels to identify the most nutritious food.	.800				
	Statement 1	I would like to know the ingredients in the food I eat.	.770				
	Statement 4	I read the cover to find out about the calorie value of the food.	.562				
Neophile factor (Factor 2)	Statement 17	I use novel products at least once.	.875	1.966	.790		
	Statement 18	I tryout products with new brand names just to find out about them.	.870				
	Statement 19	I like to accept the challenges I never accepted in my life.	.709				
Convenience factor (Factor 3)	Statement 9	I mostly use the refrigerated food.	.817	1.528	.740		
	Statement 8	I mostly consume "Ready To Drink", "Ready To Eat" food.	.792				
	Statement 10	I consume mixtures or precooked food.	.768				
Health conscious factor (Factor 4)	Statement 14	I mostly use low sugar food.	.847	1.354	.707		
	Statement 15	I use low amount of salt on food.	.816				

Cluster analysis of the samples was done by application of the four selected factors as variables achieved from factor analysis. Rapid cluster analysis method, K-means cluster algorithm was used. Sample data was divided into K clusters through random point independently. The final cluster result was obtained through 10 iterations to archive the convergence of 0. SPSS package was used for rapid cluster of samples. Samples were clustered into four categories. First, the initial cluster centres were determined. Then, optimal distance between categories was achieved through gradual iteration by the K-means cluster algorithm. The centre values of various types of variables were amended after the iteration calculation. Table 5 indicates the final cluster centres.

Four categories/ segments were clustered from the sample data collected from 288 respondents (Table 5). The result of ANOVA shows that the probability value of differences of the distances between different categories were all less than 0.001 level of significance.

First segment was represented by 30% of the respondents. It has a positive representation of all 4 factors. But the highest representation in the convenience factor and health conscious factor. This segment can be easily developed as nectar does not require any further processing and convenience to use. Due to high amount of added sugar nectar can be perceived as unhealthy beverage by many consumers, therefore such qualities should be mitigated through the product developments. Second segment consist with consumers who prefer to try new products and make healthy food purchasing decisions. This segment represents least among the sample population with 13% of consumers. Highest sample population is represented by the third cluster and it has high health conscious and information seeking characteristics. Proper advertising campaign and renewal of the packaging to give more beneficial information can insist upon the development of this market. Third segment represents 31% of the population.

Forth cluster is represented by 21% of the population and it has high characteristics for only one factor which is the convenience factor. Therefore, it can be concluded that each segment has more or less representation of all the factors.

Table 5: Cluster analysis for factor data

Factor	Cluster							
	1	Characteristics	2	Characteristics	3	Characteristics	4	Characteristics
(Factor 1)	.10778	High	-1.08553	Low	.47381	High	-.28827	Low
(Factor 2)	.34072	High	.80382	High	-.53643	Low	-.06764	Low
(Factor 3)	.84522	High	-1.12599	Low	-.59644	Low	.53548	High
(Factor 4)	.72958	High	.13509	High	.10979	High	-1.32159	Low

4. Conclusion

It was identified that currently the most preferred fruit beverage category in Colombo supermarkets is fruit nectar. From the in-depth study about the nectar beverages available in the supermarkets mango nectar was the most preferred flavour among consumers. They are more loyal to well-known brands when purchasing nectar. Most of the consumers purchase 1000ml bottles and high sugar containing nectar. Four factors namely "Information seeking factor", "Neophile factor", "Convenience factor" and "Health conscious factor" were identified as the drivers of the market. This study has divided consumers to four marketing segments which have the proportional contribution of the above-mentioned factors.

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