

## **Influence of Traffic Lights Food Labeling on Consumer Purchase Intention of Confectionery Items in Sri Lanka - With Special Emphasis to Consumers in Western Province**

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### **A B S T R A C T**

This study aims to analyse the effects of Traffic Light Food Labelling (TLFL) on the purchasing behavior of confectionery consumers and to make TLFL more effective. Today, obesity and other non-communicable health problems are caused by unhealthy food patterns among people. The research highlights the relationship between TLFL's dimensions and the decision to purchase confectionery concerning Sri Lankan consumers. By considering contemporary literature, three independent variables were selected as ease of understanding, usefulness, and visual appeal as having a relationship with purchase intention and the same constructs were chosen as independent variables were used to formulate the conceptual framework with the dependent variable as customer purchase intention towards confectionery products. The researchers took positivism as an epistemological standpoint and the research was designed accordingly. A survey was conducted with 384 participants from the Western Province with collecting quantitative data. The testing of the hypothesis was performed using Pearson chi-square for asymptotic significance. The study concluded that TLFL's understanding, usefulness and visually appealing have a strong positive effect on the consumer's decision to buy confectionery. By considering the factors that can influence consumer buying decisions, packaging can be considered one of the most crucial factors that can make it more efficient. Based on the key findings, recommendations made were to improve the effectiveness of TLFL on confectionery labels with added detail and to increase consumer awareness of TLFL.

**Keywords:** Consumer purchase intention, Confectionery, Health, Traffic light food labeling

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## 1. Introduction

The importance of a balanced healthy diet is becoming a highly debated topic today as many diseases like diabetes and obesity occur as a result of poor dietary habits (Verbeke, 2006). Hoyer (2011) believes that the general public usually does not know how bad they are affected by food and drink which are harmful to their health, since there are none of the clear indicators to recognize the contradictory effect that they might have at the moment of buying them. In Sri Lanka, with the invention of new legislation requiring the products to disclose sugar, salt and fat levels through Traffic Light Food Labeling (TLFL), where almost every confectionery product falls into the red category with over 80,000 of confectionery being sold in the country (Neo, 2019). Despite this, consumers in Sri Lanka are now embedded in searching for information about the food they consume. This high consumer preference for the usefulness of TLFL comes from having less time, less concentration on reading and less understanding of technical data and less knowledge of nutritional value compared to other food labels (Kozup & Creyer, 2004). The study by Sacks (2009), found that processing time and effort to comprehend information in TLFL was significantly reduced compared to other information nutrition labels. However, Darby (2013) shows that TLFL information sends a clear message directly to consumers, thereby encouraging them to decide what is the most appropriate food option to provide nutritious information in less time.

The research literature from the 1990s shows a significant correlation between adequate information and a high level of buying encouraged through a high level of awareness and knowledge of Nutritional labels. The study by Geiger & others (1999) supports evidence that adequate information on a food label has been shown to motivate consumers to gather more information through other food and beverage suppliers, maximizing the level of brand awareness and guiding consumers to a detailed buying decision. However, no such study has been carried out in the Sri Lankan context prompting the authors here to embark on this study. Accordingly, Sri Lankan confectionery companies will benefit from evaluating TLFL-induced changes in consumer behavior by considering the current level of health knowledge in the country and the legislative enforcement required by the government. Confectionery companies were particularly concerned about the nutritional standards and quality of the ingredients, and it would be of great value in market intelligence to ascertain the shift in consumer perception of healthcare and its impact on the confectionery products market. This study aims to fill the gaps in purchasing intention in the context of TLFL most especially among confectionery consumers in Sri Lanka. In this study, the authors attempt to answer the research question, “What is the influence of TLFL on Consumer Purchase Intention?”

In line with the research questions, the authors have derived the following objectives to be achieved as the deliverables of the study:

**RO1:** To identify the influence of TLFL’s ease of understanding on consumer purchase intent of confectionery products.

**RO2:** To identify the influence of TLFL’s usefulness on consumer purchase intent of confectionery products.

**RO3:** To identify the influence of TLFL’s visual appeal on consumer purchase intent of confectionery products

## 2. Literature review

Consumers care about the appearance of a product as well as the nutritional value of food products sold in retail and other stores (Higginson & Kirk, 2002). Nutritional levels such as carbohydrates, saturated fats, sugars, fiber, salt, monosodium glutamate, protein, or other

foods are captured using TLFL. This high consumer preference for the usefulness of TLFL comes from having less time, less concentration on reading and less understanding of technical data and less knowledge of nutritional value compared to other food labels (Creyer, 2005). TLFL makes it easier for consumers to choose healthy eating habits (Andrews, 2006). As stated by Aldrich (2011), TLFL provides a comprehensive basis for consumer decision-making before making a purchase decision. A study by Ipolito & Matthias (2011), found that processing time and effort to comprehend information in TLFL was significantly reduced compared to other information nutrition labels. However, Darby (2013) argued that TLFL information sends a clear message directly to consumers, thereby encouraging them to decide the most appropriate food option to provide nutritious information in less time. It shows that the amount of information contained in the TLFL creates a psychological aspect that enhances the direct benefits of the product. According to Guthrie (2014), the average consumer takes less than 30 seconds to make purchasing decisions at a supermarket or self-service store. In addition, studies by Watson (2014) further confirm this finding, showing that consumers look at TLFL only on the labeling material when purchasing and obtaining process information. According to the above findings, the TLFL allows customers to make healthier choices by comparing and analysing food products and when purchasing food products to educate them about the high nutritional value and purchase the most appropriate nutritional requirement.

According to Byrd-Bredbenner, et al., (2000), highly knowledgeable and health-conscious customers make a great effort to find and appreciate the information on a food label. Cowburn & Stockley (2003) shows us an easy way to deliver colour-coded messages and icons with such data. By providing them with technical knowledge specific to laymen, TLFL uses both to effectively communicate an appropriate message to consumers. The majority of labels use a colour structure that appeals to the consumer's mind, which can provide significant information to consumers, even in a matter of seconds (Jensen, 2004). Furthermore, a study by Moorman (2008) found that consumers still spend relatively more time on products and brands that provide clear and relevant visual symbols for consumer decision-making. From these points of view, it reveals that nutritional information can be easily identified by consumers through the format, colour and symbols used in the food label. The study by Massis & Raymond (2007), found that colour coding systems have a significant impact on consumers' purchasing decisions because people have been using common traffic lighting systems since their childhood. Therefore, the concept that TLFL brings to the nutrition level of food labels is easily understood by consumers (Mauskopf, 2011). Therefore, it shows that the distinctive nature of the three colours used in traffic lights has an impact on customer purchase intention. The study by Lin & Lee (2012), found that providing saturated fat, sugar, calories, and sodium information in terms of gram in specific colour code is the most systemic way to transmit the message through TLFL in European countries. Thus, it can be identified that greater visibility has a significant gravity in motivating customers to make rapid purchase decisions to give high concentration to TLFL. Furthermore, the study by Stanley & Marshall (2007) has revealed that TLFL's main objective is to ensure customers are easily attracted to the visual appeal depending on the level of simplicity of the food labels.

Eves et al. (2001) clearly show that the ease of understanding food label helps to gain complete and proper awareness of the label, except for direct references to the content of the label. Accordingly, Finke (2000) suggests that having nutrition labels in the home language or the native language increases the ease of understanding food labels and significantly affects consumer purchasing behaviour. It shows that Traffic Light Food Labelling has become an influencing factor in consumers buying decisions. Thus, it is evident that the simplicity of the language on a food label is aid in helping consumers to choose products effectively. Therefore, it clearly shows that the level of comprehension of a food label directly corresponds to consumer buying decisions. In addition to that, Feick, et al., (2002), shows that there is a better comprehension when there are more graphic components, colours, and symbols in terms of

terminology and phrases in a food label. Further, Govindasamy (2002), stated that the size of the letters on the label, the proper placement of the words, and the overall appearance of the label have a significant impact on the user-friendly awareness of the content of the label. On the other hand, in order to better understand the content of a label, especially when it comes to food and beverages, the composition must be free from technical errors or content errors and bias (Blacklock, 2004). According to Groucutt (2007), for most consumers, it takes less than a minute to read product nutrition labels. Similarly, Ismail (2011) has revealed that the comprehensibility level and straightforward components of the label increase the level of ease of understanding of consumers. As mentioned above, researchers have found that the readability of TLFL affects ease of understanding for customers at the time of purchase. According to them, the size of the label, the way the label is positioned on the package and the use of symbols rather than terminology indicate the extent of label perception of consumers at the time of purchase. The study by Jensen (2004) supports evidence that the TLFL adopts a color frame that fits the consumer's subconscious, providing customers with important information about the nutritional value of a food item, even in a matter of seconds, without having to spend a lot of time studying the color of the TLFL encoded information. Furthermore, Massis & Raymond (2007), show that the color coding in TFEL has a significant influence towards consumer decision-making since it has introduced a memory to consumers from an early age through common traffic lighting systems. Therefore, consumers can easily grab the concept that TLFL brings to the nutrition level (Mousekoff, 2011). In addition, Anderson (2011) stated that the prescribed daily intake of each ingredient has reached the specific nutritional level of that ingredient and it provides consumers with more information compared to recommended and actual nutrient consumption. Thus, it showcases that the presence of a traffic light label assists the customers to get a clear understanding of the product and customers can easily capture the composition details of the confectionary through traffic light food labels. Further, it shows that this framework provides a range of common information that simplifies food selection for consumers at the time of purchase.

It reveals that Traffic Light Food Labelling is important to consumers and consumer behaviour is affected by the adequacy of information that TLFL provides. Furthermore, Hastack (2002) reveals that the positive effect of the food label standardization given on a traffic light label increases consumer confidence in purchasing. Therefore, it showcases that the approval provided by a governing body towards the composition breakdown provided in the traffic light label enhances customer confidence at the time of purchase. Thus, the ability to increase customer confidence through TLFL can be identified as having a significant gravity to motivate customers to give TLFL a higher concentration. Moreover, Rayner and Swinburne (2009) revealed that TLFL provides consumers with the opportunity to raise awareness about high nutritional value products and to make healthier choices when purchasing by comparing and analysing food products to purchase the most appropriate nutrients. In addition, Anderson (2011) stated that the prescribed daily consumption of each ingredient has reached the specific nutritional level of that ingredient and it is useful to consumers since it provides them with more information compared to recommended and actual nutrient consumption. Furthermore, the information contained in the TLFL is useful in enhancing consumer knowledge of the nutritional value of the product content to assist in the purchasing decision (Biswas 2012). Therefore, it reveals that having a traffic light label enriches consumers' self-buying behavior and enables TLFL to make healthier food choices when making purchases.

### **3. Methods**

#### **3.1. Research design**

The research adopted the philosophy of "Positivism" which relates to quantitative research and it is considered a form of or a progression of empiricism and it is extreme in its interpretation of ontology and epistemology (Ryan, 2018). In this particular research, the researcher made a

relative ontological assumption that the consumer purchase intention towards confectionery products has gradually decreased comparatively after the intervention of the TLFL system. And epistemologically the researcher adopted an emic approach where the necessity of interactions with TLFL and customer purchase to gain in-depth knowledge of the subject area. The research adopted a deductive research approach since the research will be conducted in an area that has been explored by several researchers and the other information related to the topic is already available. Also, as the strategy, a survey was conducted as a social experiment. The research adopted a cross-sectional time horizon by considering the limited period of time used by the researcher. Furthermore, the questionnaire method is used as the data collecting method since it is required to produce quantitative and reliable data to generalize to a larger population.

The total population of this research included all confectionery consumers in Sri Lanka. The data will be gathered from the consumers in the Colombo district in Western Province. The total population of the Colombo district is 2.2 million. And a structured questionnaire has distributed to gather data among respondents. The researcher has adopted the "purposive sampling method" to determine the sample population of the research. By considering the accessibility and usability, the researcher has selected western province confectionery consumers. Since western Province is considered one of the most populated districts in Sri Lanka with the highest diversity, the selected population will give an excellent basis for setting up a representative sample. The total population of the Colombo district is 2.2 million. According to the Morgan table, the sample size of this study will be considered as 384 (Kenpro, 2012). The researcher has collected secondary data for the particular research through newspapers, presentations at conferences, Studies by industry experts, Business magazines, books, Journals, and web-based sources. Further, researchers adapted a structured questionnaire for primary data collection. The questionnaire with a five-point Likert scale structure was designed in such a way operationalizing different facets of independent and dependent variables with 13 close-ended statements specifically designed to solicit quantitative responses concerning the customer purchase intention on TLFL.

### 3.2. Measurement and data analysis methods

The researcher intends to evaluate the primary data gathered through the Statistical Package for Social Sciences (SPSS). It is used to produce histograms and frequency tables to improve data comprehensibility and presentation. Descriptive statistics are applied to describe the dispersion and Pearson's correlation statistic is used to determine the degree of interaction between TLFL and consumer purchase intention. Additionally, the researcher used the chi-square test to enable the researcher to estimate the level of significance each independent variable over the customer purchase intent.

## 4. Data analysis and results

Data collected through the questionnaires were analysed using SPSS software, which helped the researchers to assess and understand the correlations between independent and dependent variables, and allowed the researchers to test the hypotheses developed through the literature review. In deriving findings using these results related to descriptive as well as inferential statistical measures were used and presented in the following tabular forms.

### 4.1. Summary of descriptive statistics

**Table 1: Descriptive Statistics**

Independent Variable	Valid	Missing	Mean	Median	Mode	Std. Deviation	Variance	Skewness	Range
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Ease of Understanding	384	0	2.08	2.00	1.50	0.809	0.655	2.016	6.00
Usefulness	384	0	2.45	2.25	2.00	0.777	0.605	.976	4.00
Visual Appealing	384	0	2.07	2.00	1.75	0.731	0.535	1.679	4.00
Customer Purchase Intent	384	0	2.07	2.00	2.00	0.875	0.766	1.142	4.00

**Source:** Survey Data, 2021

#### 4.2. Pearson Correlation Test

**Table 2: Correlation for Ease of Understanding**

		Ease of Understanding	Customer Purchase Intention
Ease of Understanding	Pearson Correlation	1	.671**
	Sig. (2-tailed)		.000
	N	384	384
Customer Purchase Intention	Pearson Correlation	.671**	1
	Sig. (2-tailed)	.000	
	N	384	384

**Source:** Survey Data, 2021

**Table 3: Correlation for Usefulness**

		Usefulness	Customer Purchase Intention
Usefulness	Pearson Correlation	1	.529**
	Sig. (2-tailed)		.000
	N	384	384
Customer Purchase Intention	Pearson Correlation	.529**	1
	Sig. (2-tailed)	.000	
	N	384	384

**Source:** Survey Data, 2021

**Table 4: Correlation for Visual Appealing**

		Visual Appealing	Customer Purchase Intention
Visual Appealing	Pearson Correlation	1	.708**
	Sig. (2-tailed)		.000
	N	384	384
Customer Purchase Intention	Pearson Correlation	.708**	1
	Sig. (2-tailed)	.000	
	N	384	384

### 4.3. Hypotheses testing by Chi-Square test

**Table 5: Chi – Square Test Results for Ease of Understanding**

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	484.211	64	0.000
Likelihood Ratio	275.870	64	0.000
Linear-by-Linear Association	172.293	1	0.000
N of Valid Cases	384		

**Source:** Survey Data, 2021

**Table 6: Chi – Square Test Results for Usefulness**

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	345.585	60	0.000
Likelihood Ratio	193.491	60	0.000
Linear-by-Linear Association	106.992	1	0.000
N of Valid Cases	384		

**Source:** Survey Data, 2021

**Table 7: Chi – Square Test Results for Visual Appealing**

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	534.427	60	0.000
Likelihood Ratio	260.355	60	0.000
Linear-by-Linear Association	191.910	1	0.000
N of Valid Cases	384		

**Source:** Survey Data, 2021

## 5. Discussion of the findings

The first key objective of the study was to identify the influence of ease of understanding of TLFL and customer purchase intention. The “r” value of 0.671 indicates a strong relationship between ease of understanding and customer buying intention. Further, the (p) value of 0.000 shows that TLFL’s ease of understanding and customer buying intention are positively correlated. When TLFL is easy for consumers to understand, it can influence the point of purchase. In view of the (P) value of 0.000, the null hypothesis is rejected and the alternative hypothesis is accepted. Findings revealed that TLFL’s ease of understanding comes mainly from language simplicity and clarity of information. In the reviewed literature, Finke (2000) suggests that having nutrition labels in the native language increases the ease of understanding food labels and significantly affects buying intention. Similarly, on the other hand, the majority of the participants strongly agreed with the information on TLFL is understandable because it is present in all three native languages used in Sri Lanka (Sinhala, English, Tamil) with a percentage of 54.7 %. It clearly shows that the level of comprehension of a food label directly corresponds to consumer buying decisions. Similarly, Ismail (2011) has revealed that the comprehensibility level and straightforward components of the label increase the level of ease of understanding of consumers. Similarly, the majority of the participants have agreed that the readability of TLFL is having an impact on the customer purchase decision with a percentage of 82%. Further, Massis and Raymond (2007), agreed that the color coding in TLFL has a significant influence on consumer decision-making since it has introduced a memory to consumers from an early age through common traffic lighting systems. Similarly, the majority

of the participants agreed with the usage of a common format is understandable because it enhances the clarity of information at the point of purchase with a percentage of 60.2 %. Findings concluded that this framework has provided a common range of information that simplifies consumers buying decisions where language simplicity, readability and clarity of information have a profound influence on the level of use, thereby confirming the hypothetical relationship between TLFL's ease of understanding and consumer buying intent. It was investigated that there is a significant correlation between TLFL's ease of understanding and the consumer buying intention.

The "r" value for usefulness is 0.529 which indicates a strong relationship between TLFL's usefulness and customer buying intention. Further, the (p) value of 0.000 indicates a high significance for the two variables considered. The results show that TLFL's usefulness and customer buying intention are positively correlated and it means that when TLFL data is usable for the consumer to make choices, it can influence consumers at the point of purchase. In the view of 0.529 Pearson correlations, this element plays a key role in consumers' desire to buy confectionery products. Hence the (P) value is 0.000, the null hypothesis is rejected and the alternative hypothesis is accepted. Related literature identified the Usefulness of TLFL as a factor which has affected customer purchase intention on many occasions. The study by Geiger and others (1999), supports evidence that adequate information on a food label has been shown to motivate consumers to gather more information through other food and beverage suppliers, maximizing the level of brand awareness and guiding consumers to a detailed buying decision. Similarly, in this study, the participants agreed with the statement of TLFL provide adequate information at the time of purchase with a percentage of 44.3%. It shows that the consumer buying decision is affected by the adequacy of information that TLFL provides. Furthermore, Hastak (2002) reveals that the influence of the food label standardization given on a TLFL increases consumer confidence in purchasing. Similarly, the majority of the participants have agreed with the approval provided by the ministry of health towards the composition breakdown provided in the TLFL which enhances customer confidence at the time of purchase with a percentage of 82%. It showcases that the approval provided by a governing body towards TLFL enhances customer confidence at the time of purchase. Thus, this can be identified as having a significant gravity to motivate customers to give TLFL a higher concentration. Adding to the above findings, Biswas (2012), revealed that the information contained in the TLFL is useful in enhancing consumer knowledge of the nutritional value of the product content to assist in the purchasing decision. It reveals that having a TLFL enriches consumers' self-buying behavior and enables TLFL to make healthier food choices when making purchases. Similarly, in this research, 78.1% of participants agreed with the ability to increase customer confidence through TFFL have an impact on customer purchase intention of confectionery products. Thus, the findings revealed that TLFL is capable of making the selection of healthy food choices at the time of purchase. The study by Darby (2013) shows that TLFL information sends a clear message directly to consumers, thereby encouraging them to decide what is the most appropriate food option to provide nutritious information in less time. It shows that the amount of information contained in the TLFL creates a psychological aspect that enhances the direct benefits of the product. In this research, similarly, respondents have identified the ability to make quick decisions at purchasing through TLFL as another key contributor towards the customer purchase intention with a response rate of 48.4 %. According to the findings, adequacy of information, ability to increase customer confidence and ability to enhance self-purchasing behavior have a profound influence and thereby confirming the hypothetical relationship between TLFL's usefulness and consumer buying intent. It was investigated that there is a significant correlation between TLFL's usefulness and consumer buying intention.

The "r" value for visually appeal is 0.708 and the (p) value is 0.000 which indicates a high significance between the two variables considered. The results show that TLFL's visually appeal and customer buying intention are positively correlated. Therefore, when TLFL has a



strong visual appeal, it can influence consumers at the point of purchase. In particular, the color-coding system used in TLFL has a significant influence on the consumer mind at the point of purchase. Since the (p) value is less than 0.005, the null hypothesis is rejected and the alternative hypothesis is accepted. Accordingly, TLFL's visual appeal comes mainly from the distinctive nature and attractiveness of the color format. In the reviewed literature, Byrd-Bredbenner, et al., (2000), have revealed that highly knowledgeable and health-conscious customers make a great effort to find and appreciate the information on a food label. It shows that the majority of labels use a color structure that appeals to the consumer's mind, which can provide significant information to consumers, even in a matter of seconds similarly, in this study, 84.1% of participants agreed the three colours used in traffic lights are distinctive in nature and it has an impact towards buying intention of confectionery products. Furthermore, the study by Lin & Lee (2012), found that providing saturated fat, sugar, calories, and sodium information in terms of gram in specific color code is the most systemic way to transmit the message through TLFL in European countries. Similarly, the results showed that consumers consider the green color content of food labels as a healthy symbol with a higher rate (82 %) of favorable responses. Furthermore, a study by Govindasamy (2002) provides evidence that consumers spend little or no time searching for product content, so there is a front mechanism in the TLFL package to provide a better information source when purchasing. Similarly, the results showed that the majority of the participants agreed with greater visibility of TLFL are having an impact on the customer purchase intention of confectionery products with a percentage of 75%. Thus, it can be identified that greater visibility has a significant gravity in motivating customers to make rapid purchase decisions to give high concentration to TLFL.

## **6. Conclusion and implications of the study**

This study is unique in a way due to the reason, to date, not many studies have been carried out in a Sri Lankan context linking TLFL initiatives and confectionary consumer purchasing intentions. The researchers were able to provide an assessment of the consumer's actions related to the extent and readiness to buy confectionary items with TLF. It can be concluded that the distinctive nature, greater visibility and attractiveness of TLFL have a profound influence on purchasing intention and thereby confirming the hypothetical relationship between TLFL's visually appealing and consumer buying intent. It was found that there is a significant correlation between TLFL's visual appealing and consumer buying intention. It is suggested that other researchers who are planning to extend the knowledge in traffic light food labeling should look at the effectiveness of alternative methods of displaying nutritional information to improve the status of food labeling and the nutritional status of the consumers. In this study, researchers were able to gain useful insights into TLFL towards consumer behaviour in Sri Lanka by analysing purchasing intentions of confectionery consumers. The researchers were further able to present the knowledge and ideas to bridge the current gap in this field as the topic is barely covered globally as well as locally. Therefore, the researcher was able to effectively extend the knowledge by narrowing the knowledge gap and making recommendations to confectionery manufacturing organizations in Sri Lanka.

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