The Role of Food Packaging

- Consumer purchasing behaviour in Sri Lanka

Ampitiyawaththe Prasadinee Wijesundara

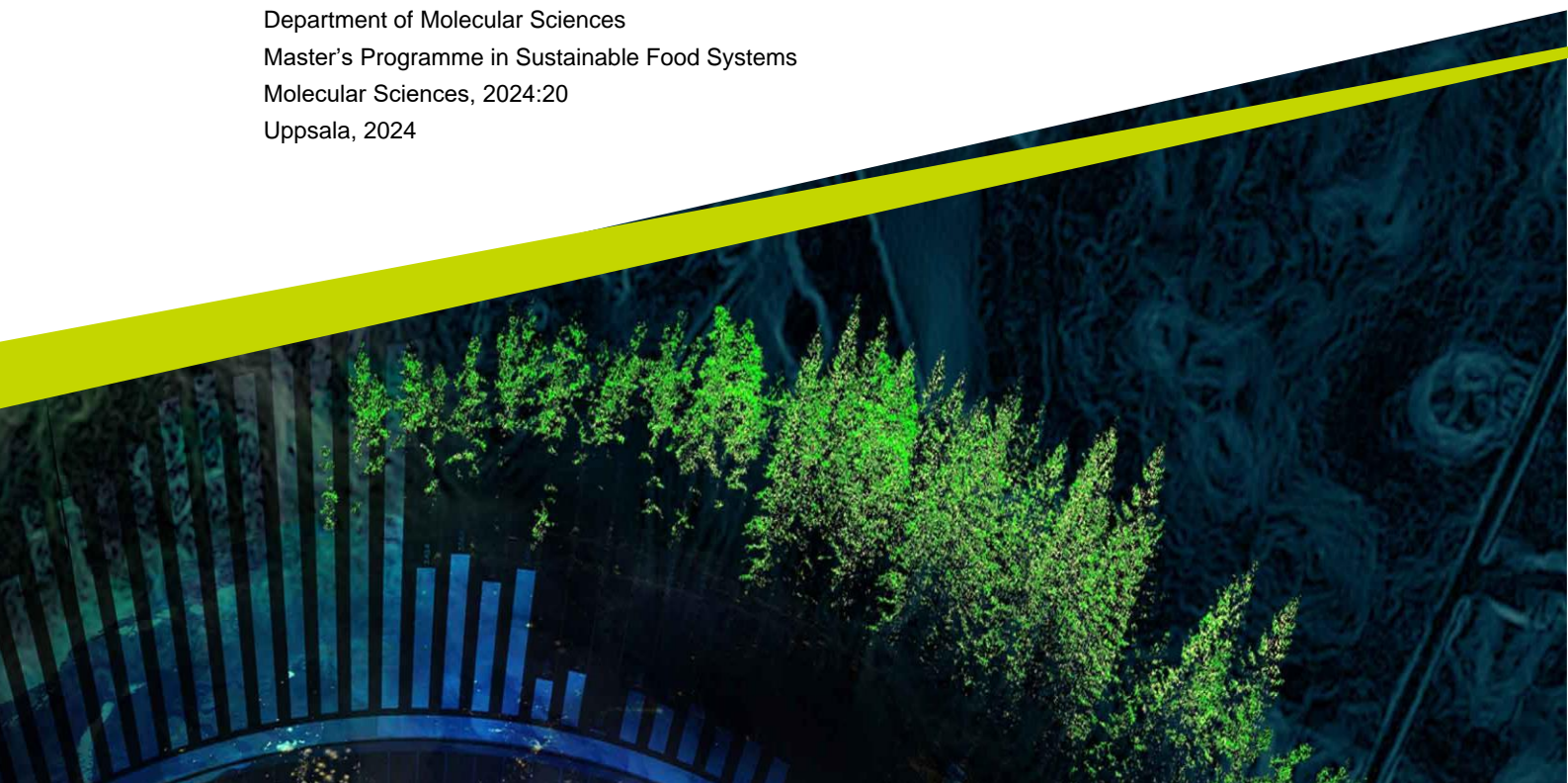# The Role of Food Packaging - Consumer purchasing behaviour in Sri Lanka

Ampitiyawaththe Prasadinee Wijesundara

Abstract

Questions about food packaging have received increased attention in recent decades. Challenges associated with sustainable development are, e.g. material selection, ensuring food quality, management in a value system and consumption-related issues. The focus has mainly been on characteristics of material selection with a life cycle perspective. Less research has focused on communication aspects. This study aims to determine the effect of food packaging elements on consumer´s buying behaviour and sustainable food consumption in Colombo - Sri Lanka. The study based on the Theory of Planned Behaviour (TPB) and questionnaire was developed according to that theory. The project was carried out in three phases, where the first phase involved a review of literature in the field of consumer behaviour (within fast moving consumer goods). Secondly, consumer data was collected, and finally, the data was analysed and discussed in the light of previous studies. The target population of this study was all shoppers in between 18-45 years, visited at one major Cargills supermarket in Colombo, Sri Lanka. Judgmental method was used in the selection of supermarket based on its accessibility, location, and population. Convenience sampling method was used in the selection of the sample. This involved selecting individuals who are readily available and willing to participate. The study was taking place during the first weekend of April 2024. The QR code was used to distribute the questionnaire among participants without wasting their time. An online survey was carried out by using Netigate software. Questionnaire was distributed among 90 consumers and 81 responses were collected. Descriptive statistics and correlation analysis were used to analyse the collected data using SPSS software. Three research questions and a research aim were addressed by the results of the study accordingly. According to the general perceptions of the consumers, the packaging material influence them more than other packaging elements and the packaging information shows the lowest influence on consumer buying behaviour. In the sustainability perceptions, the results show some deviations from the previous one. Packaging information can influence consumers most and respectively packaging colour, material, size, and graphic play that role. Packaging shape does not show any influence on consumer´s sustainability purchasing behaviours. According to that packaging material, information and colour were identified as the most influential packaging element to motivate consumer's sustainable buying behaviour. According to the results it was clearly showing that peoples behavioural beliefs involve more to decide their general behaviours but in the advance situations as an example when people need to select sustainable options over others, they use their control beliefs more to take decisions.

Keywords: packaging colour, packaging elements, packaging Information, packaging Image, packaging materials, packaging shape, packaging size, sustainable food consumption

Abstrakt

Frågor om förpackning av livsmedel har fått en ökad uppmärksamhet under de senaste decennierna. Utmaningar som är förknippade hållbar utveckling är, t.ex. materialval, säkerställande av livsmedelskvalitet, hantering i ett värdesystem och konsumtionsrelaterade frågor. Fokus har främst legat på egenskaper hos materialval med ett livscykel perspektiv. Mindre forskning har fokuserat på kommunikationsaspekter. I det föreliggande projektet är genomfört ur ett konsumentperspektiv. Det fokuserades på faktorer som förklarar köpbeteende för hållbara livsmedelsprodukter i Columbo, Sri Lanka. Projektet presenteras i ett Theory of Planned Behavior (TPB) perspektiv. Projektet genomfördes i tre faser, där den första fasen innebar en genomgång av litteratur inom området konsumentbeteende (inom fast moving consumer goods). I den andra fasen samlades konsumentdata in, och i den sista fasen analyserades data, och diskuterades i ljuset av tidigare studier. Målgruppen i konsumentpopulationen var livsmedelsinköpare i åldersspannet 18-45 år, som besökte en av Cargills matbutiker i Colombo, Sri Lanka i april 2024. Urvalet av konsumenter är ett bekvämlighetsurval, personer som var på plats och var villiga att medverka. En QR-kod förmedlades till respondenter, så att de kunde svara på enkäten, utan att uppge e-post eller andra personuppgifter. Enkätstudien skapades i Netigate, som möjliggjorde korrelationsanalys och deskriptiv statistik i användande iv SPSS programvara. Ett övergripande syfte och tre forskningsfrågor banade utgör struktur för presentationen. Resultaten pekar på att konsumenter påverkas av materialval mer än någon annan faktor. Därefter har grafik i förpackning, form, storlek och färg en viss påverkansgrad. Förpackningsinformationen var den faktor som uppgavs i mindre omfattning påverka köp. Detta resultat avviker från tidigare studier, som har visat att information på förpackningar påverkar köpbeteende. Information som uppges kunna påverka konsumentbeteende mest är förpackningsmaterial, färg, storlek och grafisk design. Förpackningens form påverkar inte alls konsumenters hållbarhetsrelaterade konsumtion. Ur ett teoretisk perspektiv indikerar den empiriska studien att konsumenters hållbarhetskopplade beteende förklaras av fler faktorer än köpbeteende.

Nyckelord: form, format, förpackning, färg, hållbar utveckling, information, material, storlek,

Table of contents

List of tables

List of figures

Abbreviations

1. Introduction

The following chapter consists with the overview of the topic, motivational factors, and the insight into consumer buying behaviour and sustainable food consumption followed by the aim, research questions and the special objectives of the study to provide a proper background knowledge to the reader.

1.1 Problem background

The food sector is crucial to the economies and societies worldwide. According to the European Commission (n.d.), the food and drink industry is the largest manufacturing sector in the EU, providing significant value-added products and numerous job opportunities. Food packaging plays an essential role in elevating the food industry by fulfilling functions related to logistics, commerce, and the environment (Konstantoglou *et al.* 2020). It enhances a company's performance by ensuring the safe and standardized storage and transportation of products. While packaging serves multiple purposes, making its definition complex, it can generally be described as,

> "Packaging suggests containers of different shapes and sizes made of packaging materials in the narrow sense, in which any type of goods or victuals is packaged, transported, stored, or sold" (Petljak *et al.* 2019:108).

Verghes & Dewis (2007) highlight that packaging plays a critical role in preserving the chemical, physical, and nutritional integrity of foods while also facilitating purchasing, warehousing, and transportation from farm to fork. Packaging acts as the product's representation before purchase and can protect the brand by effectively conveying information to customers, thereby influencing their decision-making process. Packaging significantly impacts buyer decisions by providing essential information at the point of sale (Silayoi & Speece 2004). Hence, it serves as a powerful communication tool and is crucial for product differentiation. Rundh (2009) and Silayoi & Speece (2004) assert that in the consumer market, packaging is a fundamental element of marketing strategy, playing a pivotal role in marketing communication. Additionally, sustainable packaging can lower operational costs,

draw consumer attention to eco-friendly purchases, and reduce food waste, thereby fostering a sense of sustainable consumption (Konstantoglou *et al.* 2020).

1.1.1 Consumer buying behaviour

The buying behaviour of a consumer is very complicated as well as rapidly changing factor, which is very difficult to define or predict. Some authors defined consumer buying behaviour as,

> "Some actions performed by an individual for obtaining, using and disposing of economical goods and services including processes of decision making that comes before buying behaviour". (Engel *et al.* 1986:5)

Consumer lifestyles and preferences for food consumption are diverse, with differences in the frequency and speed of consumption influenced by family size and eating habits (Yokokawa *et al.* 2018). Despite the variety in decision-making contexts and levels, several key factors influence consumer purchase decisions. These factors include external influences such as culture, subculture, social groups, situational contexts, social class, and family; internal influences like perception, attitude, knowledge, personality, lifestyle, involvement, and roles; and marketing factors such as product attributes, packaging aesthetics, promotion, distribution, service, and price (Bautista *et al.* 2019).

Most consumers say that food packaging significantly influences their product choices (Brovensiepen *et al.* 2018). This importance has grown in recent years and is expected to keep increasing (*ibid.*). Rita (2009) found that packaging catches customers' attention and affects their perception when choosing a product. With the rise of self-service in stores and faster-paced consumer lifestyles, many companies now use packaging to promote sales and encourage impulse buying.

Consumers are often drawn to new products that capture their attention immediately. As a result, appealing food packaging can encourage new customers to try a product. Various food brands use distinct packaging features, such as vibrant colours, striking designs, unique wrappers, background images, font styles, convenient shapes, and symbols. These elements collectively influence consumers' purchasing behaviour, as each attribute affects buying decisions in a unique way (Rita 2009).

1.1.2 Sustainable food consumption

In the past decade, increased food production and consumption have had significant environmental and social impacts. Current food systems are responsible for one-third of global greenhouse gas emissions (Crippa *et al.* 2021). Packaging

production uses a lot of energy and resources, and discarded packaging creates a massive amount of waste (Licciardello 2017). Most purchase decisions are made quickly and spontaneously, driven by emotions (Gidlof *et al.* 2017). Therefore, packaging design can consider unconscious factors, such as creating an eco-friendly impression, to appeal to environmentally conscious consumers.

The demand for eco-friendly packaging has been steadily increasing (Seo *et al.* 2016). There is a growing interest in using recyclable materials and packaging components (Klaiman *et al.* 2016). Reusable, recyclable, and renewable packaging options are crucial for enhancing the understanding of a product's sustainable performance (Abejon *et al.* 2020). While composite materials may reduce recyclability, they improve barriers against water and oxygen, extending the shelf life of food products. Packaging smaller quantities can increase material use per unit of food but helps prevent over-purchasing (Yolokawa *et al.* 2018). According to Lindh *et al.* (2016), consumers do not always prefer eco-friendly packaging, often valuing convenience, quality, and price more highly. Thus, consumers play a critical role in demanding sustainable packaging, as they make the purchasing decisions (Macena *et al.* 2021). It is essential to understand how food packaging influences sustainable consumption and how consumer behaviour is shifting towards sustainable packaging. Packaging designers must grasp this relationship to gain a competitive edge in the market.

1.2 Problem

Consumers often lack the time to thoroughly evaluate every product before making a decision, creating a significant challenge for food brands striving to capture their attention. To address this, companies rely heavily on packaging, which acts as a "silent salesman" by highlighting the product's features (Gomez *et al.* 2015). Packaging designers continuously innovate to meet consumer demands, using composite materials to reduce permeability, adding transparency to display contents, or incorporating "pre-cut" features for easier access.

Despite these efforts, many packaging designs fail to appeal to consumers, resulting in wasted resources and increased food waste. For example, single-use plastics, commonly used in food packaging, have significant negative environmental impacts due to their poor management (UNEP 2014). Beyond attracting consumers, packaging designs also aim to reduce environmental impact and promote sustainability. Efforts to reduce packaging weight or the number of layers to improve recyclability are common, but these designs are not always well-received by consumers (Yokokawa *et al.* 2018). Truly sustainable packaging must combine

consumer-preferred features with low environmental impact (Yokokawa *et al.* 2021).

Food packaging serves purposes beyond containment and marketing (Jäger & Piscicelli 2021). While extensive research exists on consumer preferences for specific packaging elements, few studies examine consumer perceptions and knowledge about the sustainability of these elements (Otto *et al.* 2021). There is a critical research gap concerning consumer expectations, packaging design requirements, and food sustainability (Jäger & Piscicelli 2021). Understanding the relationship between sustainability, consumer expectations, and packaging design is crucial (Testa *et al.* 2021), as it will help mitigate conflicts between sustainable packaging design and consumer buying behavior.

Other than above mentioned problem, existing literature identifies several key gaps that this research aims to address. Current studies often focus on isolated packaging elements such as material type, colour, size or shape of the packaging, without exploring what are the most effective packaging elements to influence consumer behavior and sustainability perceptions (Otto *et al.* 2021; Jäger & Piscicelli 2021). Additionally, there is a notable gap in understanding consumer knowledge and perceptions regarding the sustainability of packaging elements. Many consumers are unaware of the environmental impact of different packaging materials and designs, leading to a disconnect between sustainable packaging efforts and consumer acceptance (Otto *et al.* 2021). Therefore, comprehensive research is needed to examine how various packaging features influence consumer preferences and perceptions of sustainability (Smith & Jones 2019).

Ampuero and Vila (2006) conducted a comprehensive review of packaging research and found that most studies employ qualitative approaches such as interviews and focus groups to explore consumer preferences. They emphasize that while qualitative methods are valuable for understanding the nuances of consumer behavior, they do not provide the statistical rigor needed to draw broader inferences. However, there is a lack of quantitative research that can provide more generalizable insights and robust statistical analysis of the relationships between packaging elements, consumer behavior, and sustainability (Smith & Jones 2019). Rundh (2009) also argues that quantitative research is needed to test and validate theoretical models across different contexts and populations. This gap underscores the need for studies that employ quantitative methods to better understand the complex relationships between packaging elements, consumer behavior, and sustainability.

Much of the existing research is conducted in European contexts, where consumer behavior and sustainability perceptions may differ significantly from other regions.

There is a need for region-specific studies to understand local consumer behavior, preferences, and perceptions, particularly in under-researched areas like Sri Lanka (Yokokawa *et al.* 2021). Addressing these gaps will provide valuable insights into sustainable food packaging design that aligns with consumer needs and promotes environmental sustainability, specifically in the Sri Lankan context.

1.3   A research contribution

This study makes a significant contribution to the field of sustainable food packaging design by addressing critical research gaps identified in the existing literature. According to the Testa *et al.* (2021) by focusing on consumer expectations, packaging design requirements, and sustainability, is crucial for aligning product offerings with consumer values, driving sustainable business practices, fostering innovation, enhancing market position, supporting strategic decision-making, leveraging educational and marketing opportunities, and contributing to global sustainability goals. This holistic approach not only benefits businesses but also promotes environmental and social well-being.

Unlike previous studies that often examine isolated packaging features, this study takes a holistic approach to explore the level of impact of various elements, such as material type, size, shape, colour, graphic, and information, on consumer preferences and perceptions of sustainability. By understanding which elements have the most significant impact on consumer behavior and sustainability perceptions, companies can prioritize changes that will yield the highest returns. When packaging aligns more closely with consumers value, it increases overall satisfaction and can enhance brand loyalty. As well as companies can focus on sustainable packaging solutions that do not compromise on consumer preferences, thus promoting eco-friendly practices without sacrificing market competitiveness.

Additionally, this research employs quantitative methods, offering robust statistical analysis and generalizable insights, which are often lacking in the predominantly qualitative research landscape. It facilitates to test specific hypotheses and determine the strength and direction of relationships between variables, helping validate theories and models related to consumer behavior and sustainable packaging. Additionally, quantitative research can compare different consumer segments, such as age groups, income levels, or regions, to identify varying preferences and perceptions.

By incorporating region-specific data from Sri Lanka, this study also addresses the need for understanding local consumer behavior and sustainability perceptions in under-researched areas, thereby contributing valuable insights that can inform both

local and global sustainable packaging strategies. Ultimately, this research aims to bridge the gap between consumer preferences and sustainable packaging design, promoting designs that are both environmentally friendly and appealing to consumers.

1.4 Research aim and questions

This study aims to determine the food packaging elements that effectively influence consumers to adopt sustainable purchasing behaviour. Primary data were collected through an online survey to gain practical insights into this context. The findings were analysed using the Theory of Planned Behaviour (TPB) to understand consumer perspectives. The research encompassed all types of products without specific categorization, allowing the results to be applicable across various food groups.

Through all these guidance, finally this study aims to determine the effect of food packaging elements on consumer´s buying behaviour and sustainable food consumption in Sri Lanka.

To fulfill above mentioned objective, this study focuses on the following research questions:
1. How different food packaging elements influence on consumer´s buying behaviour?
2. How different food packaging elements influence on food sustainability?
3. How suggested food packaging elements motivate sustainable food purchasing, reduce food waste, and contribute to a more sustainable world?

Food packaging serves multiple purposes. It protects the food, keeping it fresh, and provides a platform for the food producer to convey information and establish the product's identity. This study aimed to determine the key elements of food packaging that influence consumer´s purchasing decisions. It also helped identify how food packaging contributes to shaping consumer perceptions of eco-friendly products. Ultimately, the study aimed to identify packaging that consumers would prefer, integrating features they value with environmentally conscious designs.

Food companies stand to gain significant benefits from this research, as it helps identify the most sought-after packaging features and understand consumer´s purchasing behaviours based on both general and sustainability perceptions. The insights from this research can be leveraged to develop various tools and strategies aimed at capturing a larger market share. With a better understanding of the factors

that attract consumers and their buying behaviours, packaging designers can create more effective designs aligned with sustainability principles.

1.5   Significance of the study

Understanding how food packaging influences Consumer Buying Behaviour (CBB) and sustainable food consumption is crucial. This knowledge is valuable for food manufacturers, packaging designers, retailers, marketers, consumers, policymakers, researchers, and anyone concerned about the environment. It helps them market their products effectively, gain a competitive edge, and contribute to environmental conservation by offering eco-friendly goods and services. Connecting consumer perceptions with sustainability information can lead to the adoption of more sustainable packaging practices. This understanding can assist policymakers and managers in developing strategies to promote sustainable purchasing habits.

Understanding how consumers interpret product packaging can help packaging designers create packages that better align with consumer perceptions (Otto *et al.* 2021). Traditionally, designers focused on enhancing packaging functions for various stakeholders in the product life cycle (Hellström & Olsson 2016). However, there's now a push for designers to reduce environmental impact while meeting requirements for primary, secondary, and transport packaging (ISO 2013). This encourages designers to pursue sustainable packaging by considering environmental and functional aspects throughout the entire product life cycle.

Understanding the relationship between food packaging, consumer behaviour, and sustainable food consumption can have a significant impact on achieving the United Nations Sustainable Development Goals (SDGs) by 2030 (Arora & Mishra 2019). By understanding how food packaging influences consumer choices, we can promote responsible consumption practices that align with SDG 12: Responsible Consumption and Production (Prakash & Pathak 2017). Choosing sustainable packaging materials can also help reduce the carbon footprint associated with packaging, supporting SDG 13: Climate Action (Steenis *et al.* 2017). Additionally, sustainable packaging choices can minimize environmental harm to ecosystems, supporting SDG 14: Life Below Water and SDG 15: Life on Land (Thompson *et al.* 2009).

Practicing sustainable food consumption can help reduce food waste, which is crucial for achieving SDG 2: Zero Hunger. Choosing packaging that keeps food fresh for longer can help minimize waste (Gustavsson *et al.* 2011). It's also important to consider the safety and health impact of packaging materials on

consumers, which contributes to achieving SDG 3: Good Health and Well-Being (Marsh & Bugusu 2007). Encouraging innovation in sustainable packaging materials aligns with SDG 9: Industry, Innovation, and Infrastructure. This involves finding ways to reduce environmental impact while maintaining packaging quality (Balasubramanian & Somasundaram 2014), ultimately supporting sustainable consumption and production patterns.

1.6 Delimitations

The present study has delimitations which can lead to distinguished results in future studies. It would be presented in three separate sections as theoretical delimitations, methodological and as well as empirical delimitations.

1.6.1 Theoretical delimitations

Studying consumer behaviour is challenging due to its complexity and the various factors that influence it (Mont *et al.* 2014). Research in this area requires careful consideration of numerous aspects and features that can impact consumer decisions. In this study, the assessment of sustainability of packaging elements are assessed generally without segregating into specific factors such as recyclability, biodegradability, environmentally friendliness, food waste reduction or carbon footprint and did not focus on the detailed identification of the influence of environmental features of packaging on buying decisions. The study did not specific for a particular food item, thus offering a general understanding of food packaging.

1.6.2 Methodological delimitations

The research relies on convenience sampling method, primarily involving consumers who visited to Cargills supermarket. This involved selecting individuals who are readily available and willing to participate, and it may introduce some bias but are often more practical in real-world settings. This method limits the study to a specific subset of the population, which might not represent the broader demographics of Sri Lanka. The questionnaire was developed in English language, and it eliminate the participation of the people who are not fluent in English.

1.6.3 Empirical delimitations

Selecting the Colombo area have many advantages, but it also made several delimitations to the study. Most of the people living in Colombo area have a better living standards, good education, and busy life patterns. According to that most of the respondents may include in to the same personal and social categories which limited to obtain divers answers. Thus, the findings may not be generalizable to other districts in the country and other developing countries, especially those with different socio-economic and cultural contexts.

1.7 Outline of the study

To gain a more holistic understanding of the study, the thesis is structured as shown in Figure 1.

Chapter 1	Chapter 2	Chapter 3	Chapter 4	Chapter 5	Chapter 6	Chapter 7	Chapter 8
Introduction	Theory	Method	Background	Results	Analysis	Discussion	Conclusion
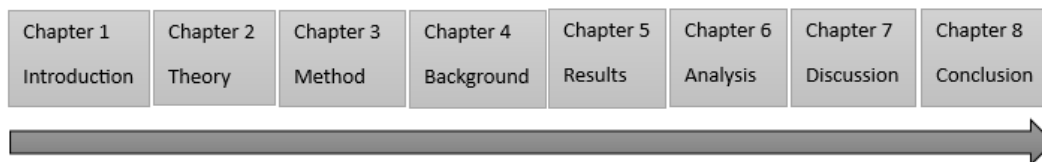
Figure 1:Illustration of the outline of the study.

As shown in Figure 1, the first chapter (Chapter 1) defines the introduction of the study including, what is food packaging and what are the problems associated with that as the aim of the study and what research questions to be addressed by this study. Chapter 2 presents the theoretical framework that shapes the process of this study. Chapter 3 explains method section, the stepwise process of primary and secondary data collection method was explained. Furthermore, it addresses quality assurance and ethical considerations. Chapter 4 covers background of the research area including food packaging elements and their effect based on consumer perspective as well as sustainability perspective. In Chapter 5 and Chapter 6 covers empirical results and their analysis in relation to the theoretical framework and the conceptual framework of the study. Chapter 7 consists of a discussion section where results are compared with the recent research studies. In the last chapter (Chapter 8) included conclusions on the research objectives, research aim and research questions, summarizing key findings followed by limitations and future research suggestions.

2. Theory

This chapter presents the theoretical framework of the study. It starts with the presentation of different theoretical models related to the theme and then presented the Theory of planned behaviour, followed by a description of behavioural beliefs, normative beliefs, and control beliefs. Finally, its linkages with this study were presented. In this study the theoretical framework will provide a lens to better understand the research area and its complexity.

2.1 Theoretical framework

Choosing what to eat is a complex and ever-changing behaviour influenced by various factors like taste, appearance, health benefits, and cultural influences (Köster 2009). When making buying decisions, people are influenced by how they perceive things, their motivations, what they've learned, and their beliefs. These factors help them navigate their surroundings, understand their emotions, gather, and process information, form opinions, and make decisions. This whole process of selecting, organizing, and understanding information is called perception (Lamb 2009).

Human food purchasing behaviour is complex, and various theoretical frameworks are used to explain it, considering many influencing factors (Shepherd & Sparks 1985). Researchers have continuously studied the emotions evoked by products from the moment of interaction to consumption. In supermarkets, the emotional connection with products can influence decision-making. Schifferstein *et al.* (2013) found that emotions experienced through product packaging in retail stores impact perceived product experiences during consumption. Environmental concern, as defined by Ogle (2004), encompasses an individual's values, attitudes, emotions, perceptions, knowledge, and behaviours related to the environment. Marketers aiming to increase the purchase of eco-friendly products must focus on understanding consumer preferences and decision-making processes thoroughly (Cherrier *et al.* 2011).

2.1.1 Models for consumer decision making process

Numerous consumer decision-making models have been created to assist marketers and researchers in comprehending the steps consumers take before making a purchase (Patwardhan & Ramaprasad 2005). These models operate on the assumption that consumers are rational and adaptive, following a series of cognitive and behavioural steps before reaching a decision to buy (Patwardhan & Ramaprasad 2005, 2).

Many economic and social-psychological theories have been developed over the years to understand and explain consumer behaviour. Examples include Rational Choice Theory (RCT) by Homans (1961), the Theory of Reasoned Action (TRA) by Ajzen (1991), and the TPB by Ajzen (2005). RCT is commonly used by social scientists to study human behaviour and has been widely applied in disciplines like sociology, political science, and anthropology (Kari 2014). This theory typically starts by examining the decision-making of individuals or groups (*ibid.*). However, RCT has been criticized for assuming that individuals always make decisions to maximize their utility or well-being, overlooking the influence of emotions, biases, social norms, and cognitive limitations. Additionally, RCT assumes that everyone in a population has similar preferences, information, and decision-making processes, which may not always be the case due to variations in values, beliefs, preferences, and cognitive abilities among individuals, leading to differences in decision-making behaviour.

TRA is a broad theory of human behaviour that helps in understanding the factors affecting customer buying behaviour. It explores the connections between beliefs, attitudes, intentions, and behaviours (Ajzen & Fishbein 1980). TPB, another theoretical framework chosen for this study, is a psychological model developed by Ajzen (2005), building upon the TRA theory (Ajzen, 1991) with additional refinements.

2.1.2 Theory of planned behaviour

The TPB, is a widely used theory for understanding consumer behaviour in relation to the environment (Ajzen 2005). The TPB, which centres on the belief that intended behaviour is informed subjectively based on attitudes toward specific behaviour (George 2004).

TPB shown in Figure 2, suggests that behavioural intentions are shaped by attitudes, subjective norms, and perceived behavioural control. It emphasizes how these factors influence both purchase intentions and actual buying behaviour among

consumers. By focusing on attitudes, subjective norms, and perceived behavioural control, TPB can help explain how consumer´s knowledge, attitudes, perceptions, and values influence their choices regarding food packaging and how their decision-making process evolves towards sustainable consumption.
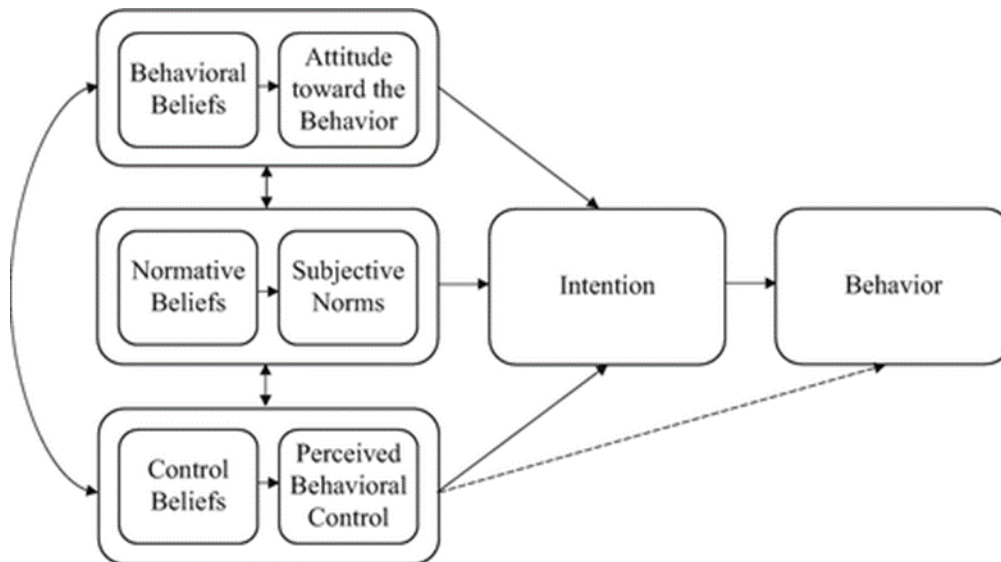
Figure 2: Theory of Planned Behaviour (Ajzen 1991, p. 182).

In Figure 2, the first component of the TPB is behavioural beliefs or attitude toward behaviour. This refers to an individual's overall attitude, which is based on their beliefs about the expected outcomes of the behaviour. These outcomes can include behavioural outcomes (such as the price of the food), emotional outcomes (such as how the food will taste), or potential risks (such as the risk of developing diabetes from consuming high-sugar foods). Each of these outcomes is associated with both an expectancy and a value (Connor 1993). The second component is normative beliefs or subjective norms, which represent the sum of an individual's normative beliefs. This component reflects the perceived social pressure to engage in the behaviour, weighted by the motivation to comply with this pressure. It is based on the social psychological assumption that our intention to perform a behaviour is influenced by both the expectations others have for us and our personal attitudes. The third component is perceived behavioural control, which refers to the amount of control an individual believes they have over the behaviour in question (Connor 1993).

2.2 Link with the study

According to the TPB, human behaviour is influenced by three types of considerations. Firstly, there are behavioural beliefs, which involve acknowledging the likely consequences of a specific behaviour, the perceived value of those consequences, and the strength of belief in these relationships (Ajzen 1991). Secondly, there are normative beliefs, which are associated with expectations and behaviours of significant others. And thirdly, there are control beliefs, which involve beliefs about factors that may facilitate or impede the performance of the behaviour (*ibid.*). In this context, TPB offers insights into the factors that affect an individual's intention and behaviour regarding the selection of sustainable food packaging and environmentally friendly food choices. By promoting positive attitudes and subjective norms related to sustainability, there is a greater likelihood of individuals preferring sustainable products. Additionally, increasing individual´s knowledge and education about environmental impact can further motivate them to choose sustainable options.

2.3 Conceptual framework of the study

The study focuses on several elements of food packaging and their impact on consumer behaviour and sustainable consumption. Firstly, the type of material used in packaging affects buyer behaviour, as high-quality materials tend to influence purchasing decisions (Pohtam *et al.* 2016). Secondly, the shape of the package plays a role in buyer behaviour and is included in the model. Thirdly, the size of the packaging, although often overlooked, is important in the buyer's decision-making process (Silayoi & Speece 2004). Additionally, the colour of the package is a significant factor that attracts buyers; beautiful colours can draw customers to products. Therefore, the model also examines the relationship between colour and consumer behaviour. The images on the packaging are also important, influencing consumers' product choices. Lastly, the information provided on the package, including details about product quality, price, and description, affects buyer assessment and brand recognition (Shah *et al.* 2013).

Conceptual framework gives the relationship between a study's dependent and independent variables. Figure 3 below shows the relationship between the packaging elements and consumer buying behaviour.
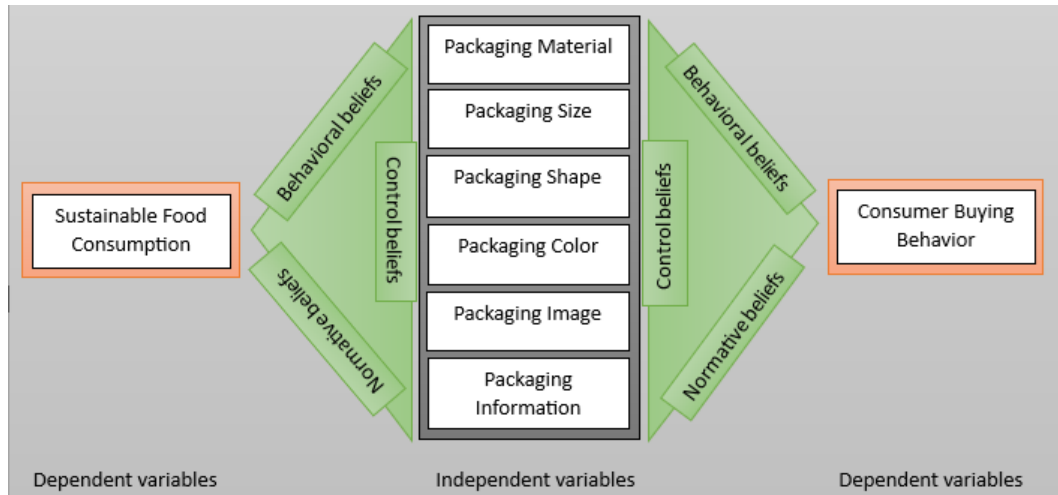
Figure 3:Conceptual Framework of the study.

The conceptual framework (Figure 3) shows that dependant variables such as CBB and sustainable food consumption of the buyers change according to their behavioural beliefs, normative beliefs, and control beliefs. When they select a food product from the shelf, they examine the independent variables such as packaging material, packaging size, packaging shape, packaging colour, packaging image and packaging information according to their subjective, normative and control beliefs and made the final choice according to that.

3. Method

This section explains sampling methods, techniques of data collection, independent and dependent variables, data analysis, delimitations, reliability, and ethical considerations of the study.

3.1 Research design

A research design serves as a roadmap for researchers to collect, analyse, and interpret observations. It enables researchers to manage the relationships between the variables under study and ensures that the evidence gathered addresses the research questions effectively. Essentially, research design involves translating research questions into a concrete project (Yin 1994).

Malhotra (1999) defines the explanatory design as a research approach where the manipulation of an independent variable influences a dependent variable. In this project, an explanatory research design was employed, utilizing regression analysis to ascertain the relationship between packaging attributes and consumer buying decisions. The study adopts a deductive research approach, wherein primary data collection aligns with the theoretical framework. Subsequently, deductive reasoning commences with hypotheses derived from these theories and principles.

3.2 Literature review

The literature review serves as structured summaries aiming to identify the current state of knowledge in a specific field and highlight any knowledge gaps requiring further investigation (Rowley & Slacks 2004). In this project, the literature review not only formed the basis for the research design but also fostered an ongoing "academic dialogue" to guide the research.

In order to develop this thesis, a vast array of scientific literature covering food labelling, consumer behaviour, policy tools and standard development was scanned and used all along the thesis process. The literature search was primarily done through online databases such as Web of Science (core collection), and Google

Scholar like academic databases but materials from previous courses were also included. These data sources helped to provide most related academic journal articles. The search strategy will be developed based on search terms included in articles such as "food packaging*", "product packaging*", "packaging features*", "packaging attributes*", "consumer behaviour" OR "consumer behaviour", "bio packaging*"," green packaging*", "Sustainable packaging*" "environmentally friendly packaging*" and "environmental impacts*". To find out most recent knowledge of the field, the literature review was focused on articles which were published between the last 10 years from 2014 to 2023. Other than these, articles related to TPB, TRA and other theoretical frameworks were also reviewed to select the appropriate theoretical framework and developed conceptual framework. References for the selected articles was saved using Zotero reference management software. Both qualitative and quantitative research articles were reviewed.

The search process was done in two parallel stages, one for the food packaging vs consumer behaviour and the other for the food packaging vs sustainable consumption. For the proceeding stages, the topic and abstract/summary of the articles were checked manually to assess their suitability. In the first part sustainability or eco-packaging related articles were excluded and for the second part articles which were for one specific eco packaging type was excluded. From both parts, articles with the food information rather than on the packaging was excluded. Food packaging, consumer buying behaviour, and sustainable packaging related articles were included. Then by analysis of the introduction, results, and discussion finally the most suitable 30 articles were selected for the review to build up the literature review of the whole report and the empirical background chapter of the study.

3.3 Sampling and selection of a unit of analysis

The target population of this study is customers who were visited to Cargills supermarkets at Colombo, Sri Lanka. Colombo area is a highly populated area in Sri Lanka consist with diverse population, in terms of social status, cultural backgrounds, age, income level, marital status and religion among other features. It boasts a permanent population of 626,000 with a daily influx of approximately 500,000 people according to the Colombo municipal council data. Selection of Cargills supermarket for this study based on the factors such as, Cargills is the largest retailer in Sri Lanka, with over 50 outlets in Colombo along. Additionally, Cargills experience high daily foot traffic from customers, it consists with diverse products with sustainability concerns, large space and customer friendly nature which will give a good environment for customers to purchasing their goods. It also provide good ground for answer the questionnaire without extra burden or stresses.

Judgmental method was used to select a Cargills supermarket. In this method researcher select a supermarket based on his/her knowledge and experience due to limitation of time and resources to enable selection and access to more supermarkets in various locations.

The subsequent selection concerns the respondents—90 consumers in the selected Cargill food stores. Convenience sampling method was used in the selection of the sample. It is a non-probability sampling method where subjects are selected because of their convenient accessibility and proximity to the researcher. This method is often used because it is easier and quicker to obtain samples (Bryman 2012). Selected sample is in the age between 18-45 and selection of this age group was determined by several factors such as, this age group typically represent a significant portion of the consumers who have purchasing power, within the 18-45 age range, there is significant diversity in life stages, including students, young professionals, parents, and individuals in mid-career. This diversity can provide a broad spectrum of perspectives on food packaging preferences, catering to different lifestyles and needs and younger adults within this age range are often early adopters of new technologies may be more manageable to online survey than other demographic segments and they were good in English language too (The questionnaire was carried out only in English language because of the limited time for translating and preparing it in both Sinhala and English languages).

3.4 Data collection

Most studies which focused on measuring consumer behaviour, were conducted by using survey methods (Deliya & Parmar 2012; Kampfer *et al.* 2017; Waheed *et al.* 2018; Konstantoglou *et al.* 2020). The reason behind that is surveys are generally more cost-effective, especially when targeting a large audience, allows researchers to statistically analyze consumer behavior patterns and preferences, ensure standardization, and offer versatility (Fowler 2014). Therefore, this study was conducted using an online survey method by Netigate software. The primary data collection was conducted during the 6th and 7th in April 2024. A structured questionnaire was distributed among respondents using the QR code. (Since this was distributed outside of the Cargills supermarket building, the verbal permission from the supervisor of that supermarket was obtained as a courtesy). The questionnaire comprised of 4 main sections and 12 sub sections consists with 40 questions, three are general questions was designed to obtain demographic information of the respondents and other questions are specifically targeted to measure the consumers' attitudes, beliefs, and controls in their purchase decisions. According to Brink and Woods (1998) questionnaires offer several advantages over other data collection methods. They save time compared to personal interviews

because participants can enter their responses directly onto the questionnaire. Additionally, questionnaires are less expensive and more convenient. Finally, they provide respondents with a sense of confidence to express themselves without fear of identification.

The questionnaire (Appendix 1) was designed using the TPB and the associated variables described in the literature. That questions in section 2 were presented in a graduated 5-point Likert scale: 1: Strongly Disagree, 2: Disagree: 3: Neutral, 4: Agree, 5: Strongly agree. The Likert scale is ideal for this study as it effectively measures the respondent's attitude towards the used attribute. As Myers (2015) explains, the Likert scale reduces misunderstanding, confusion, uncertainty, and it is user friendly. Section 2 also consist with one open ended question to get the customer feedback in a broader sense. Section 3 was designed to identify consumers' behaviour toward sustainable food consumption while they are in the shop floor. These questions also were presented in a graduated 5-point Likert scale. The questionnaire was developed in the English language only because of time constraints and the convenience of developing it through Netigate software.

3.5   Independent and dependent variables of the study

The questionnaire comprises questions related to both independent and dependent variables. Independent variables include demographic factors such as gender, age, and income of buyers (respondents), along with various packaging elements. The dependent variable in our study is CBB. Different studies utilize various dimensions to assess CBB (Fatima & Lodhi 2015). Our questionnaire incorporates questions based on two dimensions to gauge CBB: general perception and sustainability perception. Gender, measured on a nominal scale, has a notable influence on buyer behaviour (Meyers-Levy & Loken 2015). This relationship is examined in terms of which group of buyers attaches greater importance to various packaging elements. Age is also explored in relation to packaging preferences, aiming to identify which age groups favor different packaging factors. Additionally, income significantly affects buyer behaviour as higher disposable incomes increase purchasing power (Schiffman & Wisenblit 2019).

3.6   Quality assurance of the study

Every research design should aim to achieve the highest levels of reliability, validity, and trustworthiness possible (Riege 2003). By consistently evaluating the quality of the research design, as well as the choices and materials utilized, researchers can enhance trust in the study's results and conclusions, as well as in

the underlying data (Riege 2003). The techniques used to maintain the quality assurance of the study, is presented in Table 1.

Table 1: Methods used to assure the quality of the study

Validity	Reliability	Quality assurance	Ethical consideration
Pilot study	Peer review	transparency and clear documentation to ensure that other researchers can assess the quality of data	Maintain anonymity
Use of multiple source of evidence such as scientific literature, articles and other documents	Discussions with the supervisor	Clear method chapter to facilitate replication of findings by following the guidelines	Voluntary participation
having a clear aim and research boundaries	Cronbach alpha statistical method		Freedom to leave the questionnaire at any time
Comparison of the results with the already existing literature	Explain the relevant theories and concepts for each step of the project		
Supervisor's reviews			

Quality assurance is integral to every part of a thesis project. A pilot study, considered a small-scale version of the full study, is a crucial aspect of a well-designed research project (Teijlingen & Hundley 2001). It offers valuable insights for other researchers and ensures the comprehensiveness, clarity, applicability, and accuracy of the data collection tools, such as the questionnaire, as well as the methods and techniques used. According to Connelly (2008), research suggests that the pilot study sample size should be around 10% of the sample projected for the larger-scale study. Thus, in this project, 10 participants were selected for the pilot study. The questionnaire used in the pilot study remained the same as that used in the main study, with minor adjustments. However, the data collected during the pilot study was not analysed. Necessary changes were made to the questionnaire based on the findings from the pilot test before conducting the main study.

Research instrument reliability refers to the extent to which the instrument consistently produces data and results across multiple trials (Mugenda & Mugenda 1999). According to Tavakol & Dennick (2011), Cronbach's Alpha assesses

internal consistency by correlating each item's score with the total score for each observation and comparing it to the variance for all individual item scores. This study followed Cronbach's Alpha, as depicted in Figure 4. Nunnally (1978) suggests a minimum reliability acceptance level of 0.7 for the 5-point Likert scale, as Cronbach's alpha values depend on the number of items on the scale.
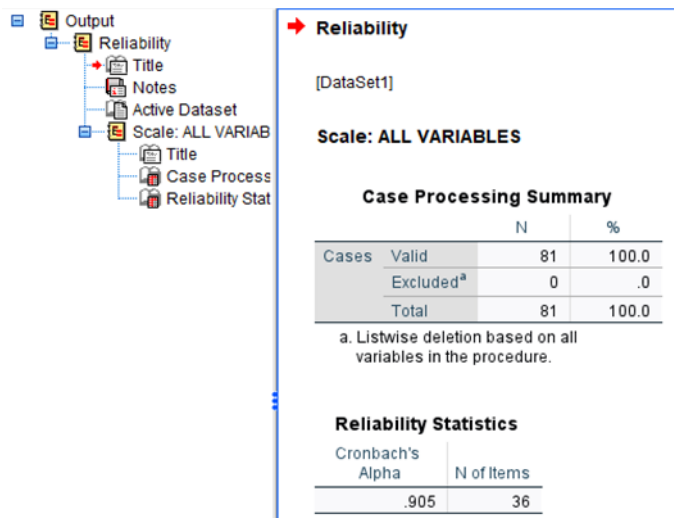
Figure 4: Cronbach's Alpha results of the data collection.

In the first table of the Figure 4 is shows that total number of answers were 81 and it had a 100% of success rate. The study targeted a sample size of 90 respondents from which 81 response to the questionnaires making a response rate of 92.0%. This response rate was satisfactory to make conclusions for the study. Mugenda and Mugenda (2003) state that a response rate of 50% is sufficient for analysis and reporting, while a 60% response rate is considered good, and a rate of 70% or higher is deemed excellent. Based on the assertion, the response rate was considered as excellent and representative to the population. Most important reliability statistics results show in the second table. Normally at there, the Cronbach's Alpha results should be in between 0 to 1. If it close to 1 it says that the reliability of that data set is high. If it close to 0 the reliability of the dataset considered as low. Here we can see there are 36 questions in the questionnaire with the measurement scale and the Cronbach's Alpha for that is 0.905. So that, the dataset of this survey had a higher internal consistency.

Bryman (2007) emphasizes the importance of ensuring that research participants are not harmed during the study. Therefore, this study implemented voluntary consent to ensure that participants freely chose to take part. According to Gu (2019), if all participants are 18 or older, consent is not an ethical or legal concern. Thus, this project involved respondents who were of consenting age. Participants were informed in the consent letter that they could withdraw from the study at any time

without consequence. No rewards or pressure were offered to participate. Additionally, to protect privacy and confidentiality, participants were assured that they would remain anonymous in the study. The questionnaire did not include questions requiring ethical consent or sensitive personal information. Furthermore, to enhance privacy, all data will be deleted within six months of the dissertation's final submission.

3.7 Data analysis

Yin (2009) states that data analysis is the research stage that deals with examining, categorizing, or connecting the evidence collected in order to reach the aim of the study.

This research containing extensive data with various sub heading and encompassing people's perspectives on food packaging elements and sustainable food consumption, quantitative analysis was selected as the most appropriate method for data analysis.

The questionnaire consists of both demographic questions and multiple-choice questions. Therefore, the analysis mainly consists with the descriptive analysis using central tendency such as mean, percentage, standard deviation and regression analysis using correlation analysis to find out the relationships between independent and dependant variables. It helps to understand the combined effect of several factors on the outcome. The data analysis was conducted using IBM Statistical Package for Social Sciences (SPSS), version 29 (2022). This software was chosen due to its fit with this quantitative research method as well, being a widely used statistical instrument (IBM Corp. 2022). The reliability of the study was measured using Cronbach's alpha method.

This analysis was carried out using a framework comprised with three sections as shown in Figure 5. The first section was assessing the impact of packaging elements on consumer buying behaviour and in the second section was assess the impact of food packaging on sustainable food consumption. Then the results from both sections were integrated into third section to assess the results based on sustainable buying behaviour concept.
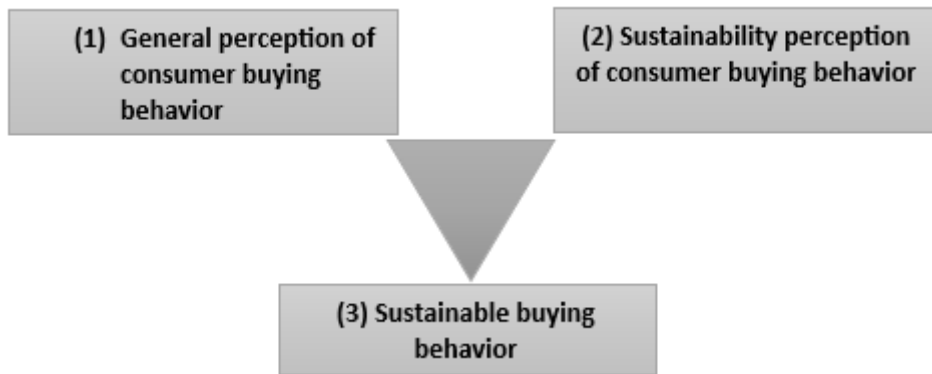
Figure 5: Conceptual Framework of the analysis.

The idea for the conceptual framework of the analysis (Figure 5) was gained from Yakokawa *et al.* (2021) and changed and developed according to this study. For the first part of the study, CBB based on packaging elements such as packaging material, size, shape, colour, image, and product information was analysed to answer the first research question. For the second part, sustainable food consumption based on the same packaging elements was analysed to answer to the second research question and for the third part, how packaging elements influence consumer buying behaviour into sustainable buying behaviour was evaluated to answer to the last research question. By that finally, it was tried to achieve the research aim and objectives successfully.

4. Background for the empirical study

This section provided a brief introduction to the scientific background of this study to clarify the status of the food packaging and identifying the position of food packaging as a marketing tool and sustainable product, followed by integrated assessment food packaging elements in consumer perspective and sustainability perspective, and the research gaps in this field.

4.1 What is packaging?

One definition for the packaging is,

> "A packaging prepares the product – from the moment of the manufacture to the consumption – for its delivery to the buyer-consumer, the way it is manufactured, in different conditions of transport, warehousing, handling, distribution and its presentation on the sales place, so the product in the packaging is best preserved form all external and internal influences" (Rodin (1977, p. 125).

According to the Official Gazette, 88/2015,

> "Package is any type of product, regardless of the material it is made of, used for containing, protection, handling, delivering and presentation of the goods from raw materials to finished products, from manufacturers to consumers".

The term "package" encompasses a wide variety of items designed to fulfill multiple functions within logistics and distribution processes. These functions extend beyond just physical containment and protection to include handling, transportation, and marketing aspects. This definition indicates a broad understanding of packaging, emphasizing its significance throughout the entire product lifecycle rather than limiting it to the traditional role of merely containing products.

Prendergast and Pitt (1996) explained that packaging in the food industry has multiple roles, including logistics, commercial, and environmental functions. According to their findings, most companies understand that packaging can

significantly influence consumer decision-making. Using better quality packaging, companies can improve storage and transport performance, standardize their logistics activities, reduce operational costs, and increase their market share (*ibid.*).

Besides its functional role, packaging also has a communicative role, helping consumers recognize products and the producer's image and identity (Konstantoglou *et al.* 2020). The marketing function of packaging conveys information about the product's attributes. Consumers often rely on packaging to form an impression of items like food that are not bought in their final form (Suci *et al.* 2021). According to cue utilization theory (Richardson *et al.* 1994), marketing professionals carefully design packaging elements because consumers often rely on external cues from the packaging when they encounter an unfamiliar brand or product or have difficulty evaluating the product's intrinsic qualities. Each packaging element acts as a "silent salesperson," briefly describing the product and trying to capture consumer attention in a crowded store (Suci *et al.* 2021). Moreover, innovative sustainable packaging can reduce environmental impacts by minimizing food waste (Konstantoglou *et al.* 2020).

4.2 Packaging as a marketing tool

When we discuss the sales value of packaging, we are primarily referring to sales packaging. Sales packaging streamlines the sales process by ensuring that the quantity of goods matches consumer needs (Vujkovic *et al.* 2007). The amount of goods packed in a sales packaging unit depends on factors like the type of goods, usage, durability, and purchasing power. Effective sales packaging boosts sales by attracting buyers' attention, sparking their interest quickly, conveying a message, and encouraging a purchase. As a result, consumers are often willing to pay more for products with appealing, persuasive, and reliable packaging (*ibid.*).

The need for packaging as a promotional tool is growing rapidly due to several factors, such as the rise in self-service culture in stores, cost reduction (since attractive packaging draws customers), and impulse buying. Malik & Bhargaw (2020) argues that packaging has now become a medium of communication between the seller and the buyer.

Holmes and Paswan (2012) highlighted the significant marketing impact of packaging, particularly its ability to create a strong first impression and communicate effectively since potential buyers encounter the packaging before the product itself. This is why many purchasing decisions are heavily influenced by visual aspects like shape, form, size, and the emotions evoked by colours (Ampuero & Vila 2006). Kotler and Keller (2007) identified material, size, shape, and colour

as the main elements of packaging. After being attracted by these elements, buyers decide to learn more about the product. They then analyse details on the packaging, such as content information, labels, production location, and expiry date (Venter *et al.* 2011). Additionally, the amount of packaging material, package size, and ease of opening and resealing are key environmental factors for consumers (Otto *et al.* 2021).

4.3 Packaging part of as a sustainable product

Consumer purchasing decisions are influenced not only by cost but also by emotional factors such as environmental responsibility and ethical sourcing (Neff *et al.* 2015). Eco-sustainable packaging refers to the criteria that assess the environmental impact of packaging materials throughout their lifecycle. To be considered eco-sustainable, packaging must meet three basic requirements related to environmental protection (Šcedrov & Muratti 2008):
- reduction of packaging and not using the packaging altogether, without endangering the product,
- reuse and multi-use of the packaging and
- choice of material for the packaging that is eco-friendly (possibly biodegradable and without harmful substances).

Reducing food waste later in the supply chain depends on consumers actually consuming the food they buy, and packaging plays a crucial role in this (Neff *et al.* 2015). One way to protect the environment is by using fewer materials and reducing the size, thickness, and weight of packaging as much as possible. Over the past 30 years, the packaging industry has made significant progress in this area. For example, jars and tins are now a third lighter than they were in the 1980s. Less packaging means using fewer materials and consuming less energy for production and transport.

Reusing packaging is another way to help the environment. Returnable packaging needs to be made from stronger materials than single-use packaging. Safety and pollution are important considerations, so analysing the entire life cycle of the product is necessary to determine if reusing packaging is beneficial. Using materials with recycled content reduces resource and energy consumption during production. It also creates a market for waste materials, making recycling more sustainable. While it is technically possible to recycle all types of packaging materials, recycling must also be economically viable to be truly sustainable (Unilever 2009).

4.4 Recent research in the field

Many authors emphasize the crucial role of human senses in consumer decision-making and consumption processes. Consumers rely on their senses such as vision, touch, smell, hearing, and taste to become aware of and learn about products, brands, and companies. The multisensory design of packaging can greatly influence consumer´s perceptions of the contents. Designers can use sensory cues like size, shape, colour, weight, images, and information to communicate messages to consumers (Veflen *et al.* 2023).

4.4.1 Packaging material

Since food packaging represents the brand on store shelves, choosing the right packaging material is crucial for gaining a competitive edge. Various materials like paper, cardboard, plastic, glass, wood, and metal are used for packaging. The choice of material depends on the product type, its chemical and physical properties, desired shelf life, customer expectations, and costs. Most consumers report that the type of packaging material influences their decision to buy a food product (Carvalho *et al.* 2022). The packaging material also varies based on whether the food product is fresh, refrigerated, frozen, or liquid. Research has shown different results regarding the impact of packaging materials on consumer behaviour and sustainability, as summarized in Table 2.

Table 2: Previous findings related to the effect of packaging material on consumer behaviour and sustainability

Type of perspective	Author(s)	Main findings
Consumer behaviour	Rahman *et al.* (2020)	Packaging color, graphics, size, and labels all have a positive and significant impact on consumer purchase intentions for junk food. However, the material of the packaging does not significantly influence consumer purchase intentions.
	Aday & Yener (2014)	Glass, as a package material attracts consumers with their protective structure and transparency, whereas plastic and paperboard packages attract consumers with their resistance to physical impacts and easy to-use abilities
	Marsh & Bugusu 2007	Plastic materials are the widely used packaging material in the food industry because they represent low costs to companies, and they can be modified into different food packaging types
Sustainability	Lindh *et al.* (2016)	For 62% of Swedish consumers, plastic is seen as the material with the most negative environmental impact followed by metal at 30%. 25% of Swedish consumers think that recyclable material has the least environmental impact
	Aviat *et al.* (2016)	Paper-based packaging (80%) is expected to be the material with the least negative environmental impact followed by glass (9%).

This table shows several key points regarding consumer attitudes towards packaging materials, their perceived environmental impact, and their influence on consumer purchase intention. It suggests that different packaging materials appeal to consumers based on their perceived functional benefits. While functional attributes influence consumer preferences for packaging materials, environmental concerns are increasingly shaping consumer attitudes and preferences towards more sustainable packaging options.

Based on the above information, the following hypothesis was developed.
H1: There is a significant positive relationship between packaging material and customer purchase intention.
H2: There is a significant positive relationship between packaging material and sustainability.

Primary data related to this topic were collected using section 2 question number 4,5,6 and section 3 question number 22, 23, 24 in the survey questionnaire.

The formulation of hypotheses in this study aims to integrate and test the findings from previous research on individual packaging elements within a comprehensive, multi-element framework. This approach is designed to provide a more holistic understanding of how various packaging features collectively influence consumer preferences and perceptions of sustainability mainly with their level of influence.

4.4.2 Packaging size

Consumers perceive different sizes differently based on factors like their purchasing power, social class, and family size. Some may compare size to price, especially if it seems reasonable (Rahman *et al.* 2020). Product involvement and the availability of alternatives also play a role. Previous research has provided insights into the impact of packaging size on consumer behaviour and sustainability, as summarized in Table 3.

Table 3: Previous findings related to the effect of packaging size on consumer behaviour and sustainability

Type of perspective	Author	Main findings
Consumer behaviour	Silayoi & Speece (2004)	Consumers recognize more packages' size to be larger, even they can experience true volume and always buying these packages.
	Eldesouky & Mesias (2014)	Numerous participants preferred smaller-sized packages. Many attendants chose the package with additional characteristics such as easiness to open and resealability.
	Silayoi & Speece (2004)	When the consumers cannot define the quality of the product by the appearance of the packaging, the packaging size will have a very strong impact towards the customers' purchase intention
Sustainability	Neff *et al.* 2015	Packaging designs that allow for flexibility in quantity and portioning, ensure that consumers are able to buy in the quantities they need, effectively save leftovers for future use, and retrieve as much residual product as possible, all of which serve to reduce food waste.

Goldenwest Admin (2023).		Developing single-serving or smaller portion packages can help minimize waste by catering to individual needs, thereby reducing the chances of consumers discarding unfinished products.

The details provided by above table emphasize the importance of packaging size in influencing consumer behaviour and reducing food waste. It indicates that packaging size that incorporate features like portion control options and flexible quantity options can play a crucial role in addressing consumer needs and mitigating food waste.

Based on the above information, the following hypothesis was developed.
H3: There is a significant positive relationship between packaging size and customer purchase intention.
H4: There is a significant positive relationship between packaging size and sustainability.

Primary data related to this topic were collected using section 2, question number 7, 8, 9 and section 3, question number 25,26,27 in the survey questionnaire.

4.4.3 Packaging shape

Past studies indicate that consumers tend to view products more positively if they find the packaging appealing. Shape plays a significant role in packaging design (Veflen *et al.* 2023). The shape of both the product and its packaging can influence consumer´s perceptions and expectations of the product's sensory attributes, likability, and purchase intent (Velasco *et al.* 2016). Most food and beverage products are packaged in specific shapes, which can convey certain attributes to consumers (Van Ooijen *et al.* 2017). Packaging comes in various shapes, ranging from regular shapes like circles and squares to more irregular forms (Konstantoglou *et al.* 2020). Previous research has provided insights into the impact of packaging shape on consumer behaviour and sustainability, as summarized in Table 4.

Table 4: Previous findings related to the effect of packaging shape on consumer behaviour and sustainability

Type of perspective	Author	Main findings
Consumer behaviour	Suci *et al.* (2021)	Squares are perceived as simpler to manufacture, more effective for showcasing product information and fits well on such store displays. Also, Squares

		are considered more attractive, since they symbolize balance, stability, and perfection
	Ali *et al.* (2015)	Shape of packaging will influence the purchase intention of consumers who prefer the Shape or design of packaging that is convenient
	Veflen *et al.* (2023)	The participants liked the round packaging more relative to the square and triangle packaging
Sustainability	Srinivasan & Lu (2014)	Consumers highly consider about easy of storage, easy of opening, reusability, comfortable to hold, ease of use, stands out of the shelf and attractiveness of the packaging shape before purchasing

Above details highlight the significance of packaging shape in consumer perception and purchase behaviour. Consumers prioritize packaging characteristics such as ease of storage, opening, reusability, ergonomic design, shelf presence, and overall attractiveness when making purchasing decisions, underscoring the importance of shape and design in influencing consumer preferences and satisfaction.

Based on the above information, the following hypothesis was developed.
H5: There is a significant positive relationship between packaging shape and customer purchase intention.
H6: There is a significant positive relationship between packaging shape and sustainability.

Primary data related to this topic were collected using section 2 question number 10,11,12 and section 3 question number 28,29,30 in the survey questionnaire.

4.4.4 Packaging colour

Colour holds significant importance as a sensory aspect of product packaging (Spence & Velasco 2018). It becomes especially crucial in low-involvement decisions and acts as a marketing tool for fast-moving consumer goods (Garber *et al.* 2000). Often, the colour of packaging is closely associated with specific brands, like the blue for Barilla products or purple for Cadbury (Spence 2016). Marketers frequently leverage colours to attract consumer interest and capture attention towards the product. Additionally, colours help to imprint the product and brand name in consumer´s minds, leaving a lasting impression (Labrecque *et al.* 2012). Previous research has explored the impact of packaging colour on consumer behaviour and sustainability, as summarized in Table 5.

Table 5: Previous findings related to the effect of packaging colour on consumer behaviour and sustainability

Type of perspective	Author	Main findings
Consumer behaviour	Lindh *et al.* (2016)	A natural bright colour that is common for the product, on a background with similar hues, induces the expectation of a natural, sustainable product and packaging.
	Baruk & Iwanicka (2015)	Colour has the greatest ability to attract attention and colour helps to emphasize various positive features of a product such as its freshness, delicateness, or modernity.
	Malika (2020)	Colour is the most important element which affects purchase decision of the consumer than packaging design, images, material, and font style.
Sustainability	Hallez *et al.* 2023	Cool packaging colours (i.e. green and blue) increased perceptions that food and drinks were healthy and sustainable
	Seo and Scammon (2017)	an ecological claim led to stronger beliefs that the brand is sustainable when the claim was presented in a green (versus a red) colour frame

These findings emphasize the strategic importance of colour selection and presentation in packaging design for effectively communicating brand values and influencing consumer behaviour.

Based on the above information, the following hypothesis was developed.

H7: There is a significant positive relationship between packaging colour and customer purchase intention.

H8: There is a significant positive relationship between packaging colour and sustainability.

Primary data related to this topic were collected using section 2 question number 13,14,15 and section 3 question number 31,32,33 in the survey questionnaire.

4.4.5 Packaging image

Product images on food packaging play a crucial role in branding, especially for lesser-known brands and those offering experiential benefits. Therefore, food packages often feature polished images to persuade consumers about the contents.

Product managers and marketers use attractive images on food packaging to showcase the characteristics and benefits of the products, aiming to enhance consumer´s positive attitudes (Huang *et al.* 2022). Previous studies have investigated how packaging size influences consumer behaviour and sustainability, as summarized in Table 6.

Table 6: Previous findings related to the effect of packaging image on consumer behaviour and sustainability

Type of perspective	Author	Main findings
Consumer behaviour	Huang *et al.* (2022)	The extent of image exaggeration did not affect consumers' reactions to utilitarian food and ingredient images. In contrast, consumers were sensitive to exaggeration when viewing images of hedonic food and cooked food.
	Rundh (2009)	Graphics are becoming essential in modern marketing activities as striking or appealing visual make the products noticeable on the shelf and captivate the consumer's attention
	Folkes & Matta (2004)	people are inclined to obtain food information through images in packaging. Therefore, it is essential to place the image in a conspicuous position suitable for the shape of the packaging
	Chiang & Yu (2010)	Using appropriate colours in images is an essential factor that affects consumers' perception.

The details highlight the nuanced role of visual elements, particularly images, in consumer responses to food packaging. According to that, Graphics play an increasingly crucial role in modern marketing by enhancing product visibility and capturing consumer attention, underscoring the importance of striking visual elements in packaging design.

Based on the above information, the following hypothesis was developed.

H9: There is a significant positive relationship between packaging image and customer purchase intention.

H10: There is a significant positive relationship between packaging image and sustainability.

Primary data related to this topic were collected using section 2 question number 16,17,18 and section 3 question number 34,35,36 in the survey questionnaire.

4.4.6 Packaging information

In today's world, packaging serves as a representative of the product, similar to a salesperson in traditional stores. Therefore, it must convey all the necessary information that consumers used to receive from sales staff. This includes details about the manufacturer, origin, contents, shelf life, usage instructions, manufacturing date, and storage instructions. Additionally, sales packaging should ensure the quality and quantity of the packed goods, indicating that the packaging has not been tampered with and contains the specified amount (Stipanelov & Vrandeci 2010). Various studies have explored how packaging information influences consumer behaviour and sustainability, with differing results summarized in Table 7.

Table 7: Previous findings related to the effect of packaging information on consumer behaviour and sustainability

Type of perspective	Author	Main findings
Consumer behaviour	Clement (2007)	consumer do not spend much time on food labels due to time pressure
	Schoormans & Robben (1997)	Label information on food packaging acts as main channel for the resolution made at the purchase point and cited that the printed data or information on packaging play a crucial role at the purchase transaction
	Eldesouky & Mesias (2014)	Participants stated that they always look for specific information on the package such as expiration date, origin, and weight.
Sustainability	Silva *et al.* (2017)	pro-environmental consumers select environmentally friendly sustainable products based on package labelling; however, most consumers ignore labelling.
	Grunert *et al.* (2014)	sustainability labels currently do not play a major role in consumers' food choices, and future use of these labels will depend on the extent to which consumers' general concern about sustainability can be turned into actual behaviour.

The details highlight the dichotomy between consumers' limited attention to food labels due to time constraints and the crucial role that label information plays in their purchase decisions.

Based on the above information, the following hypothesis was developed.

H11: There is a significant positive relationship between packaging information and customer purchase intention.

H12: There is a significant positive relationship between packaging information and sustainability.

Primary data related to this topic were collected using section 2 question number 19,20,21 and section 3 question number 37,38,39 in the survey questionnaire.

5. Results

This chapter presents the main findings from the survey, through the lens of the conceptual framework in chapter 2.3. The chapter starts with the presentation about the results related to the demographic characteristics of the participants in the selected sample and ends up with discussing about the gathered evidence under each independent variable with considering the consumer perspective and the sustainability perspective. Descriptive and inferential statistics have been used to discuss the findings of the study.

5.1 Background information of the participants

Normally demographic information of the participants was represented by nominal data. Descriptive statistics such as mean, standard deviation and frequencies were utilized to summarize the demographic information data of the participants. The summary of the demographic factors analysed included gender, age, and personal income of the participants in Sri Lanka were shown in the Table 8 and detailed version of the results were shown in Table 9.

Table 8: Summary of the demographic data

		1. Gender	2. Age	3. Monthly personal income
N	Valid	81	81	81
	Missing	0	0	0
Mean		1.47	3.31	3.59
Std. division		0.502	0.996	1.253

Table 8 shows that the All three questions were answered by 81 participants and no missing data were available. The mean of 1.47 suggests that, on average, the population tends to have a slightly higher representation of males (coded as 1) compared to females (coded as 2). A smaller standard deviation (0.502) suggests that gender values are relatively close to the mean, indicating that there may be less variability in gender distribution within the population. The coding scheme for age ranges were 1 = 18-25 years, 2 = 26-30 years, 3 = 31-35 years, 4 = 36-40 years, and 5 = 41-45 years. Based on the mean and standard deviation provided, we can

interpret that, on average, the population tends to be in the 31-35 age range, with some variability in ages across the population. Coding scheme for monthly income ranges were 1 = Below Rs 20,000, 2 = Rs 21,000 - 49,999, 3 = Rs 50,000 - 79,999, 4 = Rs 80,000 - 99,999 and 5 = Rs 100,000 or above. According to mean value of 3.59 indicate that the average monthly income falls within the range of Rs 50,000 - 79,999 and a larger standard deviation suggests that income values are more spread out from the mean, indicating greater variability in income levels within the population.

Table 9: Detailed presentation of the demographic data

	Frequency	Percentage of frequency
Gender		
Male	43	53.1%
Female	38	46.9%
Age (years)		
18-25	2	2.5%
25-30	14	17.3%
31-35	33	40.7%
36-40	21	25.9%
41-45	11	13.6%
Personal Income (monthly)		
Below Rs.20,000	4	4.9%
Rs. 21,000-49,999	14	17.3%
Rs. 50,000-79.999	20	24.7%
Rs. 80,000-99,999	16	19.8%
Above 100,000	27	33.3%

Table 9 described that what are the frequencies of the items in individual variables and what amount of percentage represented by that item. Using these details, we can get a thorough idea about our participants, and it will help to understand how their differences effect to their perspectives on food packaging as consumers. Among participants, the majority was represented by male participants and their percentage was 53.1% of the total participants. Female participants were represented 46.9% hence the distribution of respondent was nearly equal. Most participants were belonging to the age group of 31-35 and represented 40.7% of the total group of participants. This implies that most respondents were young adults, which can be attributed to general population in the Colombo area and shows that young adults have high purchasing power over others. Most participants were received above Rs. 100,000 as their monthly income and it represent 33.3%. Colombo is the most developed city in Sri Lanka and many people especially young adults move from countryside to Colombo city for better job opportunities and

lifestyles. Normally Cargills like supermarket attract their attention more since it gave opportunity for them to purchase variety of items in one place with difference choices as well as calming purchasing environment.

5.2 Consumer buying behaviour and food sustainability in Sri Lanka

General perceptions of consumer buying behaviour and the sustainability perceptions of consumer buying behaviour are the two dependent variables of this study. The results of these variables were presented in Figure 6, 7 and 8 below.
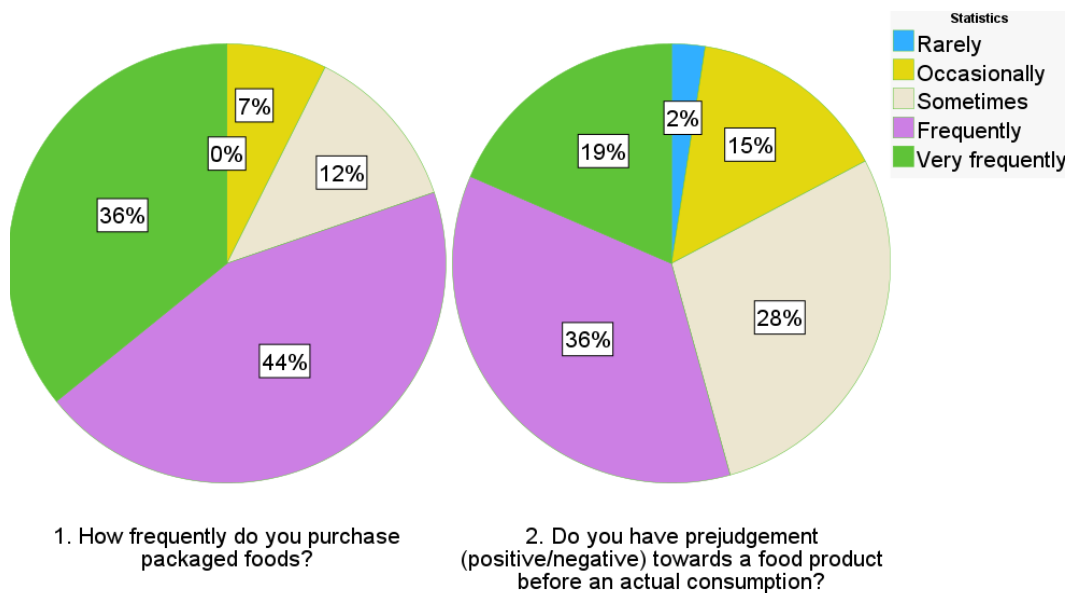
Figure 6: General perception of consumer buying behaviour.

Figure 6 shows the results of question 1 and 2 in the questionnaire under the heading of "General perception of consumer buying behaviour". Majority of respondents (80%) were purchased packaged foods frequently and very frequently, so that the outcome of this study is very much important for the future sales and marketing practices. In the other hands majority (55%) have prejudgement towards food products before actual consumption. So that at the shopfloor, these judgements were influence customers in a negative or positive way to purchase food items. Packaging can improve their positive thoughts and change their negative thoughts.

40. How important is it for you to purchase food products that are produced using sustainable practices?
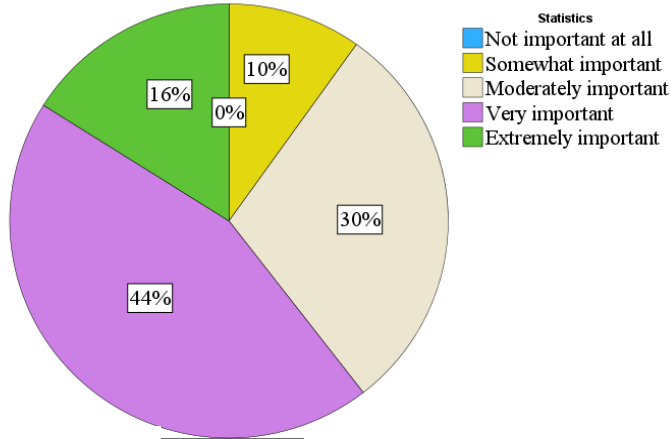
Figure 7: Sustainability perception of consumer buying behaviour.

Figure 7 shows the consumer´s trend of buying products with sustainable practices. Majority (60%) said that it's important to buy products with sustainable practices. It highlighted that if customers can clearly identify sustainable products by its packaging it will help them to purchase those items over other items.

41. 41.How often do you prioritize purchasing locally sourced food products over those that are imported?
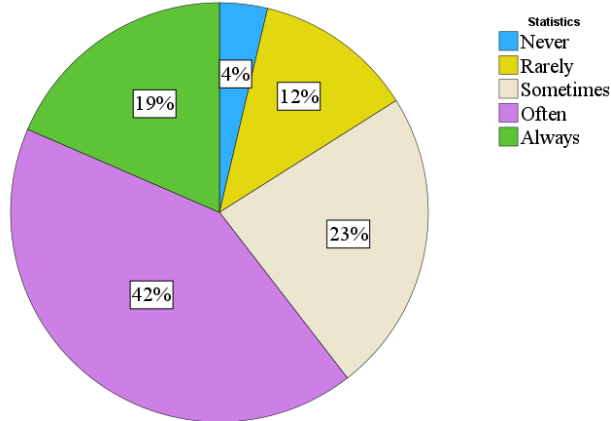
Figure 8: Sustainability perception of consumer buying behaviour.

Figure 8 shows that consumers perception about locally sourced food products over imported ones. Majority 61% said that they often and always give priority to local food products. So, it's important that packaging contain necessary information about products origin to catches consumers attention quickly.

5.3 Effect of food packaging on consumer buying behaviour and food sustainability in Sri Lanka

5.3.1 Influence of packaging material on purchase behaviour and food sustainability

The survey questionnaire consists of 6 questions to measure the consumer´s perception on packaging material which was shown in Figure 9.

Figure 9: Consumer´s perception on packaging material.

Question number 4,5,6 in the section 2 and 22,23,24 in the section 3 were tried to gather the information regarding how packaging material influence consumer purchase decision and sustainable purchasing. According to the results majority (65%) agreed that they were influenced by the transparent nature of glass packaging, 61% have a control over selecting food products based on the packaging material but most of the participants (35%) said that their family or media cannot influence them to buy plastic products over other products even though its convenience, light weight, and low-cost material. Most participants (80%) were believed that food packaging cause impacts on the environment and because of that they (72%) have influence from their family and peers to select environment friendly food packaging materials and reusable packaging that can use for additional purposes beyond its initial purpose.

5.3.2 Influence of packaging size on purchase behaviour and food sustainability

The survey questionnaire consists of 6 questions to measure the consumer´s perception on packaging size which was shown in Figure 10.

Figure 10: Consumer´s perception on packaging size.

Question number 7,8,9 in the section 2 and 25,26,27 in the section 3 were tried to gather the information regarding how packaging size influence consumer purchase decision and sustainable purchasing. According to the results majority (59%) agreed that they were influenced by the packaging size, 49% would like to buy large packages to gain cost per unit saving benefits but 45% agreed that they have been influenced by their family while selecting packaging size and 30% have not clear idea about how their family influence them to select packaging size by thinking how often they use a particular product. Most of the participants (41%) agreed that small packaging more sustainable than large packaging. Majority (52%) influence by their family to select correct packaging size to minimize waste and promote sustainability and most (47%) were thinking that portion control packaging limit their desired level of eating.

5.3.3 Influence of packaging shape on purchase behaviour and food sustainability

The survey questionnaire consists of 6 questions to measure the consumer´s perception on packaging shape which was shown in Figure 11.

Figure 11: Consumer´s perception on packaging shape.

Question number 10, 11, 12 in the section 2 and 28, 29, 30 in the section 3 were tried to gather the information regarding how packaging shape influence consumer purchase decision and sustainable purchasing. According to the results most of them (40%) agreed that their purchase decisions were influenced by the packaging shape, 46% were said that they were not influenced by society or media to by innovative packaging shapes but 63% agreed that they have control over selecting packaging shape based on their storage capacity. The majority (57%) of the respondents agreed that food packaging shape can contribute to sustainable food consumption and 49% said they their families encourage them to buy packages with refiling facility. Due to easy/difficulty of handling majority (75%) have control over some food packaging shapes.

5.3.4 Influence of packaging graphics on purchase behaviour and food sustainability

The survey questionnaire consists of 6 questions to measure the consumer´s perception on packaging graphics which was shown in Figure 12.
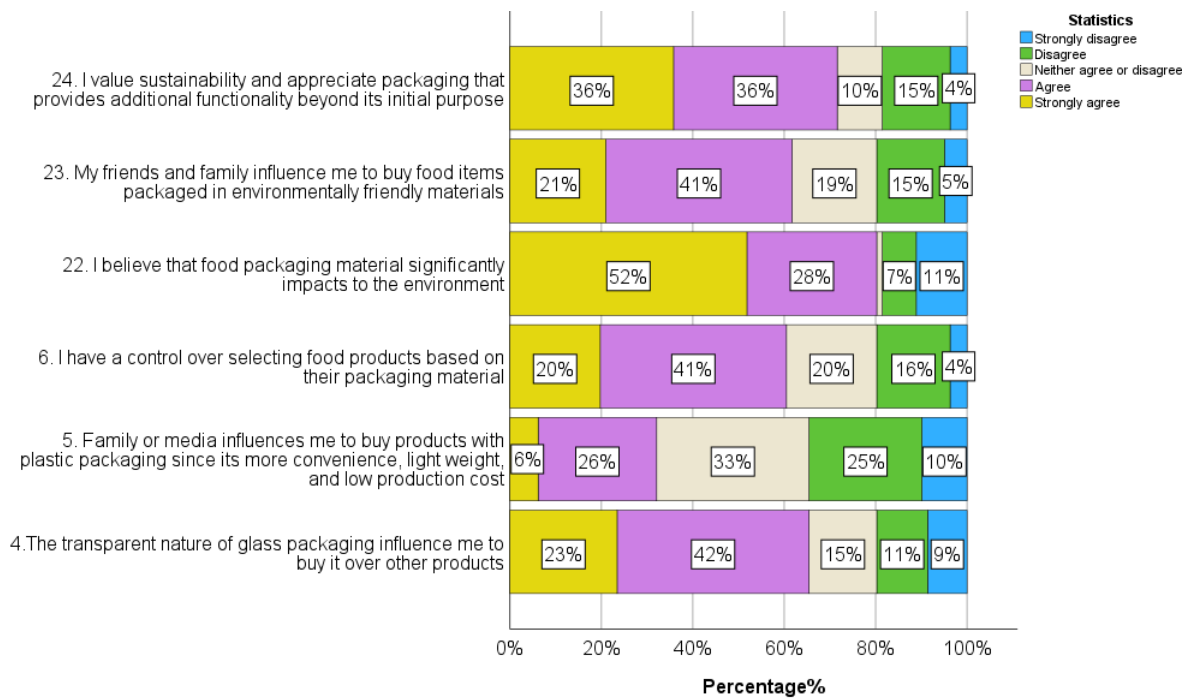

Figure 12: Consumer´s perception on packaging graphics.

Question number 13, 14, 15 in the section 2 and 31, 32, 33 in the section 3 were tried to gather the information regarding how packaging graphics influence consumer purchase decision and sustainable purchasing. According to the results majority (64%) agreed that their purchase decisions were influenced by the packaging image, as well as majority (64%) were agreed that graphics can encourage purchases by making memorable impression about the product, but most participants (49%) said that they were not selecting new brands based on their inspiring packaging image. The majority of the respondents (79%) were agreed that eco-friendly and nature inspiring packaging image improve consumer awareness regarding sustainable products and 59% agreed that they were been encouraged by society and media to select sustainable products using packaging images. Due to clear recycling symbols or natural landscape images, majority (78%) have confidence to select environmentally friendly purchasing decisions.

5.3.5 Influence of packaging colour on purchase behaviour and food sustainability

The survey questionnaire consists of 6 questions to measure the consumer´s perception on packaging colour which was shown in Figure 13.
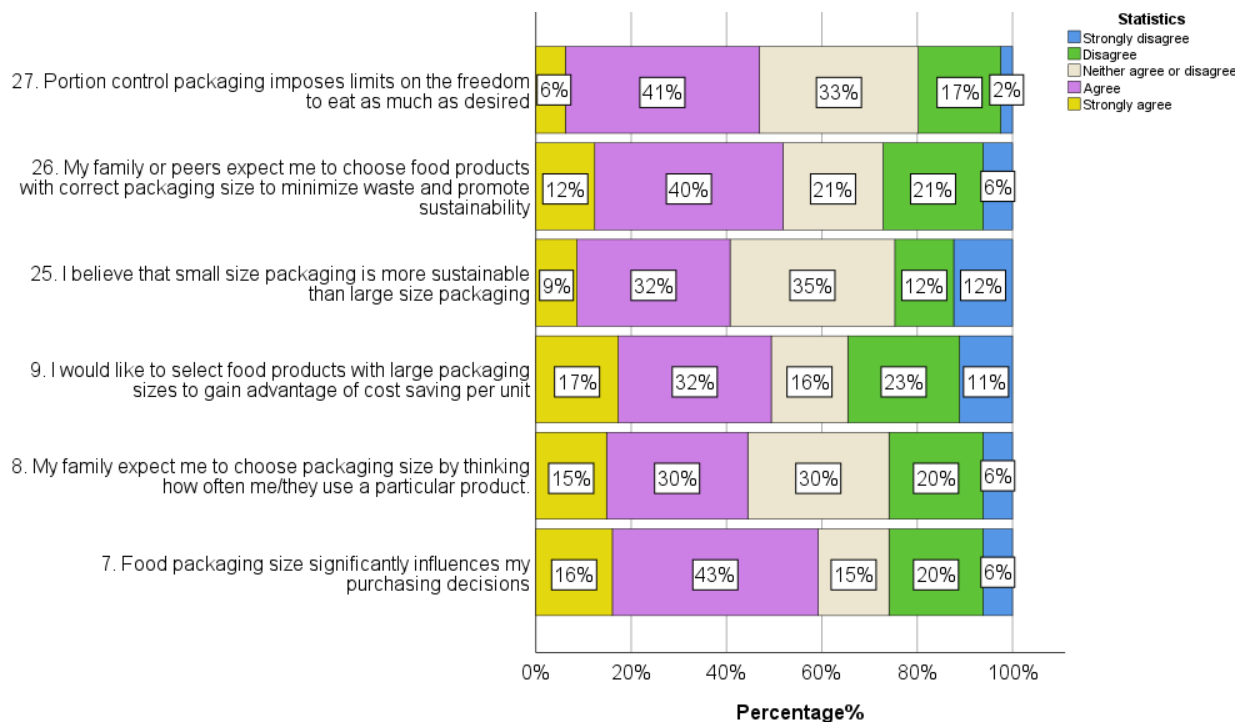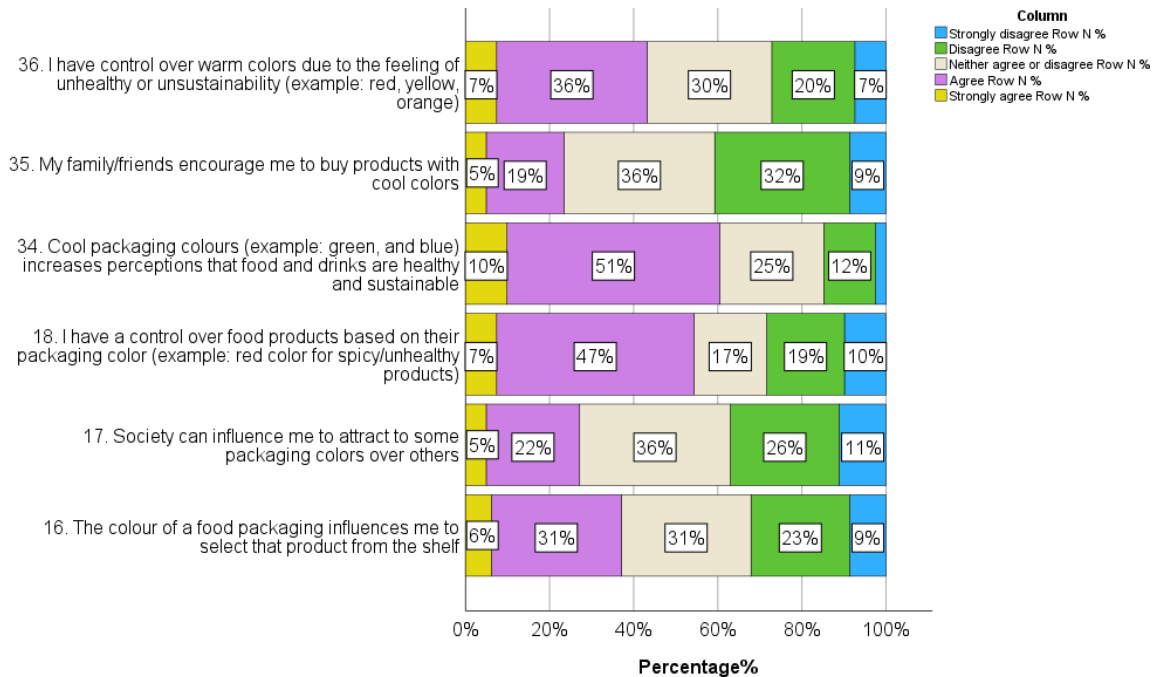

Figure 13: Consumer´s perception on packaging colours.

Question number 16, 17, 18 in the section 2 and 34,35,36 in the section 3 were tried to gather the information regarding how packaging colour influence consumer purchase decision and sustainable purchasing. According to the results 37% were agreed that their purchase decisions were influenced by the packaging colour, and most participants (36%) said that they have no idea about whether society influence or not them to attract to some colours over other colours. Majority of the respondents (54%) were agreed that they have control over some food products based on their packaging colour. 61% of the participants were agreed that some colours can give them a feeling of that foods healthy and sustainable. About one third of the respondents (36%) said that they have not a clear idea about whether, their family and friends encourage them to buy cool colours or not. Due to unhealthy and unsustainable feeling made by warm colours most participants (43%) do not buy warm colour packaging.

5.3.6 Influence of packaging information on purchase behaviour and food sustainability

The survey questionnaire consists of 6 questions to measure the consumer´s perception on packaging colour which was shown in Figure 14.
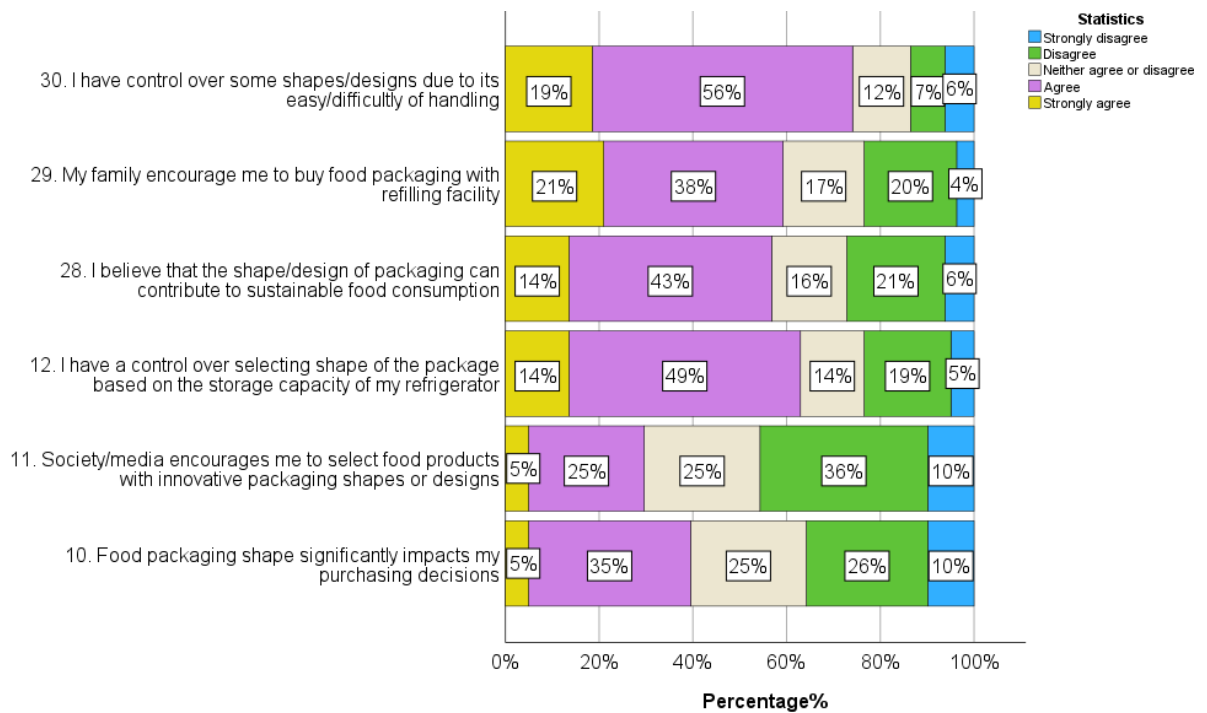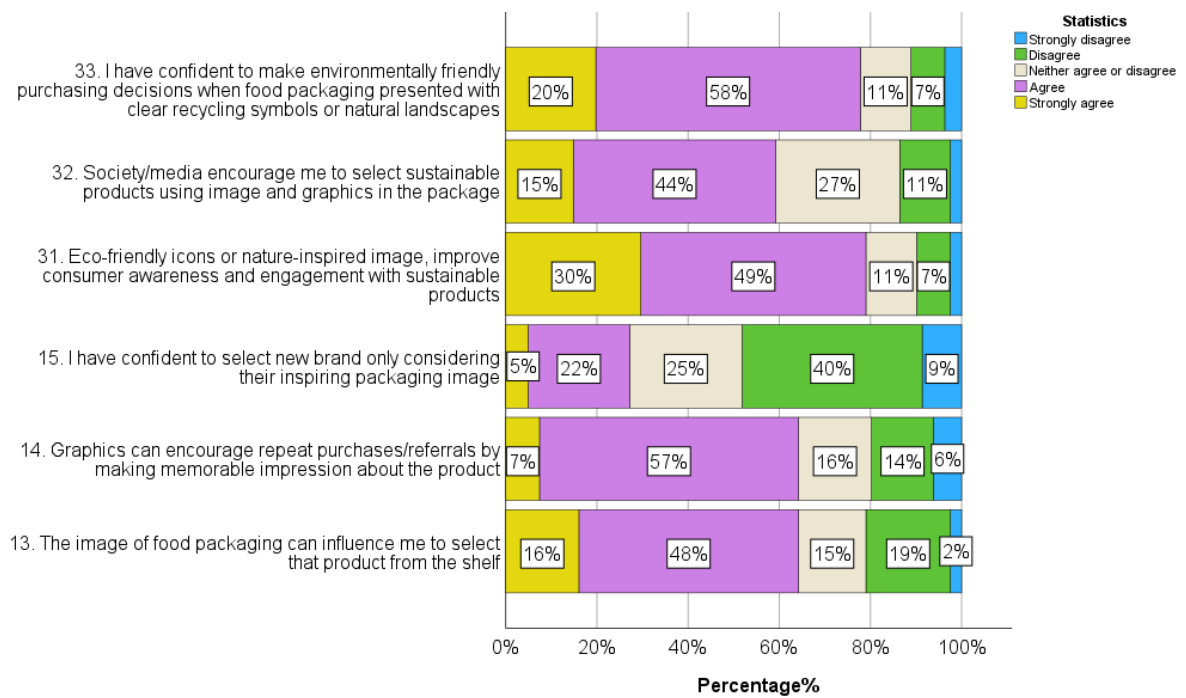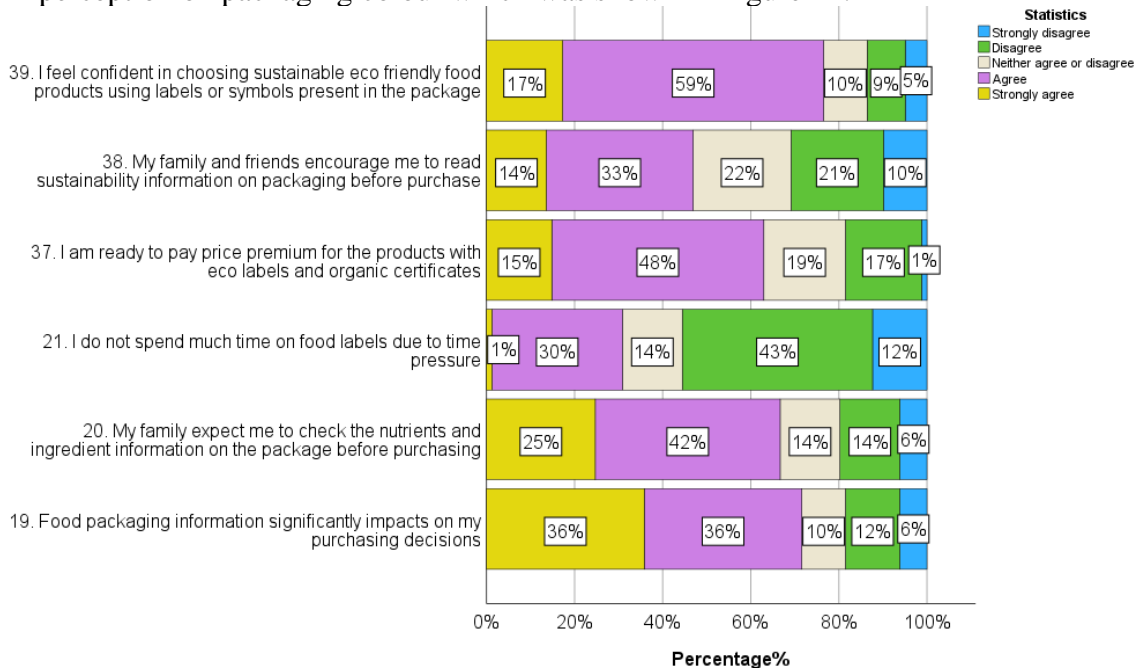

Figure 14: Consumer´s perception on packaging information.

Question number 19, 20, 21 in the section 2 and 37,38,39 in the section 3 were tried to gather the information regarding how packaging information influence consumer purchase decision and sustainable purchasing. According to the results 78% of the participants believed that packaging information impact on their purchasing decision. Majority of the respondents (67%) stated that their family expect them to check the nutrient and other information on the packaging before purchasing the item, and most of participants (55%) spend time on food labels before made the decision. About 63% participants ready to pay a price premium for the products with eco labels and organic certificates. 47% participants have family influence to read information before purchasing and 76% participants were confident enough to choosing sustainable, eco-friendly products based on their labels and symbols present on the package.

5.4 Influence of behavioural beliefs, normative beliefs and control beliefs over consumer buying behaviour and sustainability behaviour

Table 10 presented the way of consumer´s perceptions and sustainability perceptions change according to their behavioural, normative and control beliefs.

Table 10: Mean values of behavioural, normative and control beliefs

	Behavioural beliefs	Normative beliefs	Control beliefs
General perception	3.40	3.15	3.14
Sustainability perception	3.59	3.33	3.60

According to the Table 10, the mean values of the questions which represent three types of beliefs over the consumer´s general perceptions and sustainability perceptions on food purchasing were calculated. Under the general perception question number 4, 7, 10, 13, 16, 19 were representing the questions based on behavioural beliefs. Question number 5, 8, 11, 14, 17, 20 were representing the questions based on normative beliefs and question number 6, 9, 12, 15, 18, 21 were representing the questions based on control beliefs. In the general perceptions behavioural beliefs influence consumers more on purchasing decisions over others. But in the sustainability perception control beliefs influence consumers more on sustainability purchasing decisions over other beliefs but behavioural beliefs also give a considerable effect on that.

6. Analysis

This chapter discusses the results in relation to the research questions and objectives which was used to determine the effect of packaging elements on consumer's buying behaviour in Sri Lanka and when relevant, compare them with those of other studies. This chapter was divided in to three main sections based on the conceptual model presented in 3.7 and aims to explain the results from the empirical findings from the perspective of the presented theories in Chapter 2. The chapter begins with the summary of the results and latter part of the chapter points out the limits of the present study. Inferential statistics such as corelation analysis and regression analysis were used to analyse the data.

6.1 Summary of the results

The previous chapter began by present the results of the participant´s demographic information collected from the survey. Among participants, about half of the respondents (53.1%) were represented by male participants. 40.7% of the participants were belonging to the age group of 31-35 which represent the highest portion. Most of the participants (33.3%) were received above Rs. 100,000 as their monthly income. Consumers perceptions were presented under the six themes as influence of packaging material, packaging size, packaging shape, packaging graphics, packaging colour and packaging information. In addition to that consumer´s sustainability perceptions under mentioned themes were also presented. Finally, it shows that, how behavioural beliefs, normative beliefs, and control beliefs influence to consumers general perceptions and sustainability perceptions.

6.2 Analysis of the results

The results were analysed and discussed based on the theoretical framework presented in Chapter 2 and was divided in to three main sections based on the conceptual model presented in 3.7. The main theoretical framework for this study is TPB and the three main sections were general perception of consumer buying behaviour, sustainability perception of consumer buying behaviour and combined effect of these two were presented as the sustainable buying behaviour. This section

discusses the results in relation to the research questions and objectives which was used to determine the effect of packaging elements on consumer's buying behaviour in Sri Lanka and when relevant, compare them with those of other studies.

6.2.1 Normality test

A normality test is a statistical tool used to check if a set of data follows a normal distribution, which has a bell-shaped curve. This is important to use certain statistical methods like Pearson Correlation, Regression, or T-tests. To check for normality, measures like skewness and kurtosis, which shown in Table 11, were calculated. It shows how much the data deviates from a normal distribution. Ideally, these values should be close to zero for a normal distribution. However, to get a more accurate assessment, formal normality tests like Shapiro-Wilk or Kolmogorov-Smirnov tests which also shown in Table 11 should be used. These tests help to ensure that data of the current study meets the assumption of normal distribution before proceed the analysis.

Table 11: Test of normality

	Skewness	Kurtosis	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
			Stat.	df	Sig.	Stat.	df	Sig.
Normality	-1.775	0.646	0.063	81	0.200*	0.984	81	0.396

*.This is a lower bound of the true significance.
a.Lilliefors Significance Correction.

In a normally distributed population, the skewness z-value and the Kurtosis z-value should be within the range of -1.96 to +1.96. According to the above table the skewness value is -1.775 and kurtosis value is 0.646 which both are within the accepted range. According to Sekaran and Bougie (2009), if the significance value of the Shapiro-Wilk Test is greater than 0.05 then the data generated is from a normally distributed population, if it is below 0.05 then the data is not normally distributed. According to the results shown in the Table 11, significant value is 0.396 which is above the 0.05 and implies that data tested was from a normally distributed population. The bell shape histogram of the dataset is shown in Figure 15.
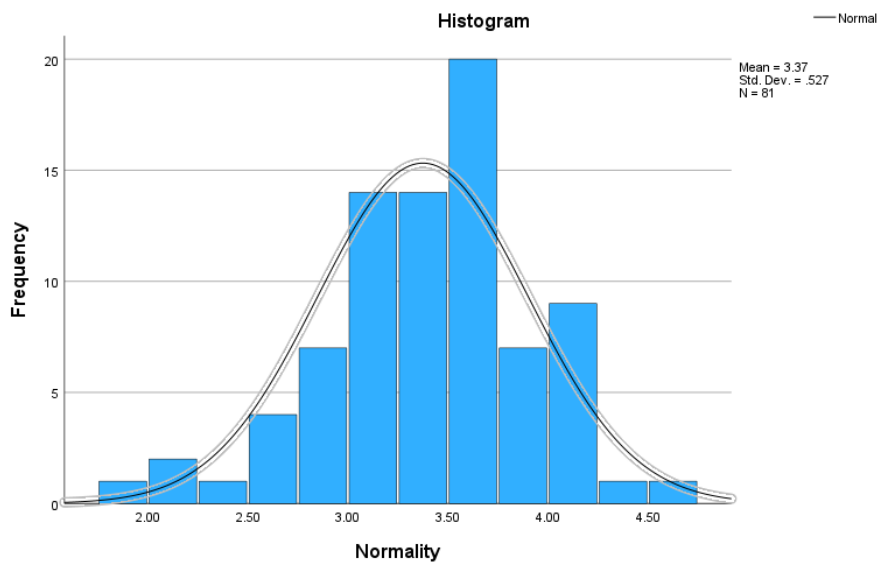
Figure 15: Histogram of the dataset.

According to the Figure 15 it can be clearly identifying the distribution of the data set obtained a bell-shaped curve which is characterized by a normal distribution.

6.2.2 General perception of consumer buying behaviour

The study used the Pearson Correlation analysis to determine the relationship between packaging material, size, shape, graphic, colour and information on consumer's general perceptions about food purchasing in Sri Lanka. The results were as shown in Table 12.

Table 12: Pearson Correlation analysis results of consumer's general perception vs packaging elements

		General perception	Material	Size	Shape	Graphic	Colour
General perception	Pearson Correlation	1					
	Sig. (2-tailed)						
Material	Pearson Correlation	.828	1				
	Sig. (2-tailed)	<,001					
Size	Pearson Correlation	.413	.182	1			

	Sig. (2-tailed)	<,001	.104				
Shape	Pearson Correlation	.417	.320	.490	1		
	Sig. (2-tailed)	<,001	.004	<,001			
Graphic	Pearson Correlation	.429	.382	.478	.486	1	
	Sig. (2-tailed)	<,001	<,001	<,001	<,001		
Colour	Pearson Correlation	.379	.359	.343	.500	.504	1
	Sig. (2-tailed)	<,001	<,001	.002	<,001	<,001	
Information	Pearson Correlation	.292	.283	.312	.321	.425	.415
	Sig. (2-tailed)	.008	.011	.005	.003	<,001	<,001

**Correlation significant at the 0.01 level (2-tailed).

*Correlation significant at the 0.05 level (2-tailed).

The results as shown in Table 12 revealed that there was a very strong positive correlation between consumer's perception and food packaging material as shown by r= 0.828, and this relationship is statistically significant at both the 0.01 and 0.05 levels since p=0.001. There is a strong positive correlation between consumer's general perception and food packaging size as shown by r = 0.413, statistically significant P= 0.001<0.05. There is a strong positive correlation between consumer's general perception and food packaging shape as shown by r = 0.417, statistically significant P= 0.001<0.05. There is a strong positive correlation between consumer's general perception and food packaging graphic as shown by r = 0.429, statistically significant P= 0.001<0.05. There is a strong positive correlation between consumer's general perception and food packaging colour as shown by r = 0.379, statistically significant P= 0.001<0.05. There is a strong positive correlation between consumer's general perception and food packaging information as shown by r = 0.292, statistically significant P= 0.008<0.05. According to these interpretations Hypothesis 1,3,5,7,9 and 11 were accepted. This implies that packaging attributes such as material, size, shape, graphics, colour, and information significantly influence consumer purchasing behaviour when they are selecting one product type within the different kind of brands in the same shelf. These attributes play a crucial role in catching the consumer's eye and communicating key aspects of the product, thereby shaping their immediate perceptions and decisions.

consumers are not only assessing the product's functionality and appeal but also forming a perception of its overall value and suitability. This holistic evaluation process happens quickly on the shop floor, where the visual and tactile aspects of packaging can make a significant impact. Therefore, effective packaging design can sway consumer decisions, making it a crucial element in marketing and sales strategies.

In summary, the way packaging attributes influence consumer behaviour in-store highlights the importance of these elements in the purchasing decision. It suggests that respondents actively consider material, size, shape, graphics, colour, and information before making a purchase, as these factors collectively shape their perception and choice of the product.

6.2.3 Sustainability perception of consumer buying behaviour

The relationship between packaging material, size, shape, graphic, colour and information on consumer's sustainability perceptions of food purchasing in Sri Lanka were shown in Table 13.

Table 13: Pearson Correlation analysis results of consumer's sustainability perceptions vs packaging elements

		Sustaina bility percepti on	Material	Size	Shape	Graphic	Colour
Sustainabil ity perception	Pearson Correlatio n	1					
	Sig. (2-tailed)						
Material	Pearson Correlatio n	.422	1				
	Sig. (2-tailed)	<,001					
Size	Pearson Correlatio n	.398	.239	1			
	Sig. (2-tailed)	<,001	.032				

Shape	Pearson Correlation	.184	.358	.203	1		
	Sig. (2-tailed)	.101	.001	.068			
Graphic	Pearson Correlation	.339	.428	.295	.486	1	
	Sig. (2-tailed)	.002	<,001	.007	<,001		
Colour	Pearson Correlation	.550	.290	.374	.257	.406	1
	Sig. (2-tailed)	<,001	.009	<,001	.021	<,001	
Information	Pearson Correlation	.665	.519	.409	.205	.302	.425
	Sig. (2-tailed)	<,001	<,001	<,001	.067	.006	<,001

**Correlation significant at the 0.01 level (2-tailed).*

Correlation significant at the 0.05 level (2-tailed).

The results as shown in Table 13 revealed that there was a very strong positive correlation between consumer's sustainable perception and food packaging material as shown by r= 0.422, and this relationship is statistically significant at both the 0.01 and 0.05 levels since p=0.001. There is a strong positive correlation between consumer's sustainable perception and food packaging size as shown by r = 0.398, statistically significant p= 0.001<0.05. There is a strong positive correlation between consumer's sustainable perception and food packaging graphic as shown by r = 0.339, statistically significant p= 0.002<0.05. There is a strong positive correlation between consumer's sustainable perception and food packaging colour as shown by r = 0.550, statistically significant p= 0.001<0.05. There is a strong positive correlation between consumer's sustainable perception and food packaging information as shown by r = 0.665, statistically significant p= 0.001<0.05. According to these interpretations Hypotheses 2, 4, 8, 10 and 12 were accepted. This implies that packaging attributes such as material, size, graphics, colour, and information influence consumer´s sustainable perceptions when they are in the shop floor. This suggests that the respondents considered these factors prior to making a purchase decision. Correlation between consumer's sustainable perception and food packaging shape as shown by r = 0.184, gives p= 0.101 which

is greater than 0.05 or 0.01 levels. Therefore, we cannot accept the H6 and suggest that the packaging shape may not be helping to influence consumer´s sustainable perceptions.

6.2.4 Sustainable buying behaviour of the consumer

Table 14 shows the summary results of Table 12 and Table 13 which indicate person corelation analysis of consumers' general perceptions and sustainable perceptions over the selected packaging elements.

Table 14: Summary of consumer perception and sustainability perception

		Material	Size	Shape	Graphic	Colour	Information
General	r =	0.828	0.413	0.417	0.429	0.379	0.292
perception	p =	0.001	0.001	0.001	0.001	0.001	0.008
Sustainability	r =	0.422	0.398	0.184	0.339	0.550	0.665
perception	p =	0.001	0.001	0.101	0.002	0.001	0.001

r = Pearson correlation value   p = p value

According to the analysis of the results in Table 14, the combination of consumer´s general perceptions and sustainable perceptions together were used to identify the most influential packaging elements to change consumer´s buying behaviour toward the sustainable buying behaviour. According to this, generally consumers pay more attention to the packaging material than the other packaging elements.

7. Discussion

This chapter shows how the research reached to its aim and answered the research questions from the perspective of the presented theories in Chapter 2. It also compares them with those of other studies when relevant.

In the following chapters, the results were discussed based on the TPB presented in Chapter 2. It starts with a broader context of the results, to explain how the research has reached to the aim and answered the research questions. Next, it was presented the framework in which consumer´s general buying behaviour changed according to their behavioural beliefs, normative beliefs, and control beliefs. The chapter then discuss the results of consumer´s sustainability perspectives, framed by the above three beliefs. Lastly, it presents the advantages of identifying consumer´s perceptions on different packaging elements based on their behavioural beliefs, normative beliefs, and control beliefs to design attractive food packaging which can influence consumers purchasing decisions.

7.1 Addressing to the research aim and research questions

The present study aims to identify the factors influencing the purchasing decisions of customers in Sri Lanka. Based on correlation analysis, the study found significant relationships between consumer buying behaviour and various packaging elements, including material, size, shape, graphics, colour, and product information. Among these, packaging material had the highest impact. Thus, the first research question—How different food packaging elements influence on consumer´s buying behaviour? was answered. These findings align with Carvalho *et al.* (2022), who reported that most consumers consider the type of packaging material when purchasing food products. Aday & Yener (2014), also indicate that,

"Glass packaging attracts consumers with protective structure and transparency and plastic and paperboard attract consumers with resistance ability and easy to use ability".

Similarly, Rahman *et al.* (2020) found that packaging colour, graphics, size, and labels significantly influence consumer purchase intentions. However, Rahman argued that packaging material was not significant in influencing consumer purchase intentions, which contrasts with the current research findings. Graphics also play a critical role to attract consumer´s attention in generally. Information gains low attention from consumers, and it may be due to time concerns. It will support the findings of Clement (2007, p.18) which highlighted the statement as,

"Consumer do not spend much time on food labels due to time pressure".

Based on the correlation analysis results, the study found that there is a significant relationship between packaging material, size, graphics, colour, and product information on consumers' sustainability behaviour. The most important factor is packaging information. Thus, the second research question—How different food packaging elements influence on food sustainability? was answered. But it will create an argument with the findings of Silva *et al.* (2017) and Grunert *et al.* (2014) which highlighted the statements as,

"Most consumers ignore labelling" and "sustainability labels currently do not play a major role in consumer´s food choice".

However, packaging shape does not significantly affect consumers' sustainability behaviour. This answers the second research question about which food packaging elements are significantly related to food sustainability.

Srinivasan & Lu (2014) found that consumers prioritize easy storage, easy opening, reusability, comfortable handling, ease of use, shelf standout, and attractiveness when considering packaging shape before purchasing. These factors are about convenience rather than sustainability, which aligns with the current findings.

Silva *et al.* (2017) showed that environmentally conscious consumers choose sustainable products based on package labelling, supporting the current results. Similarly, Hallez *et al.* (2023) found that cool packaging colours (green and blue) enhance perceptions that food and drinks are healthy and sustainable, which is consistent with the current study's findings.

The correlation analysis results indicated that packaging material, colour, and information are the most influential elements in motivating sustainable food purchases, reducing food waste, and contributing to a more sustainable world. This answers the third research question. Consequently, the study successfully achieved its aim of determining the effect of food packaging elements on consumers' buying

behaviour and sustainable food consumption in Sri Lanka. So that food packaging designers should pay an attention on environmentally friendly, recycling materials, use cool and nature inspired colours, and highlight labels, certificates, and country of origin like useful information to attract customers easily to sustainable food products.

By identifying the details mentioned above this study achieved the requirement of fulfilling the research gaps, where we need to identify truly sustainable packaging designs which combine with consumer-preferred features and have low environmental impact. At the same time, the results were allowed to compare the effect of each element and find out their level of differences. The quantitative nature of this study also allowed to gather many statistical data which allowed broad comparisons to better understand the complex relationships between packaging elements, consumer behaviour, and sustainability. The comparisons with previous studies conducted in European context were allowed to understand how those results differ from the findings of the present study in the Sri Lankan context. Since our results could not be generalized to whole Sri Lankan context, we only can get some idea about the targeted population only. But it makes some sense about how people´s perspectives, beliefs, and attitudes can change according to the region, education, income, age, or other reasons.

7.2 How behavioural beliefs, normative beliefs and control beliefs influence consumer purchase decisions?

According to the results in Chapter 5.4, consumers' general perceptions are primarily influenced by their behavioural beliefs rather than by normative or control beliefs. This can be explained using TPB by Ajzen (1991). Behavioural beliefs, also known as attitudes towards behaviour, are based on an individual's beliefs about the significant outcomes of their actions. These outcomes can be categorized as behavioural (e.g., the price of food), emotional (e.g., whether the food will taste good), or potential risks (e.g., the high sugar content leading to diabetes). Each of these outcomes has an associated expectancy and value (Connor 1993).

Consumers prioritize these beliefs because of the immediate satisfaction or utility they expect from their purchase (Kahneman & Tversky 1979). Immediate gratification tends to have a more substantial impact on decision-making than long-term considerations (*ibid.*). Generally, consumers value their personal tastes, desires, and experiences over external pressures to meet social expectations or external outcomes (Bicchieri 2006). This suggests that emotional appeals can be

more compelling than rational arguments based on normative or control beliefs (Kahneman & Tversky 2016).

7.3 How do behavioural beliefs, normative beliefs and control beliefs influence sustainable purchase decisions?

The study indicates that consumer´s sustainability perceptions are primarily based on personal control beliefs rather than normative or behavioural beliefs. Control beliefs pertain to consumer´s perceptions of their ability to influence outcomes through their actions (Bandura 2001). Consumers who strongly believe in the impact of their actions can recognize the long-term benefits of sustainable practices for both themselves and future generations (Steg & Vlek 2009). Consequently, they may prioritize control beliefs because they see themselves as agents of change (Bandura 2001).

Control beliefs often arise from a sense of personal responsibility towards environmental and social issues. This intrinsic motivation can significantly drive their sustainable purchasing decisions. Promoting positive attitudes and subjective norms related to sustainability can enhance the preference for sustainable products. Additionally, individual´s knowledge and education about environmental impacts also motivate them to choose sustainable options. Behavioural beliefs, while secondary, still considerably influence consumer´s sustainable purchasing decisions.

7.4 Demographic distribution

According to the results, majority of shoppers were male customers but the difference between male and female percentages are low. The findings suggest that gender may not be a significant factor influencing shopping behaviour or store patronage. Both male and female shoppers appear to be represented fairly equally in the sample, indicating that the store or product offerings may appeal to a diverse range of consumers regardless of gender.

Majority of consumers from age group 31-35 years. The 31-35 age group typically represents individuals who are in their late twenties to early thirties, often characterized by significant life events such as career advancement, starting a family, or purchasing a home. Companies and marketers can tailor their products, services, and marketing strategies to cater to the preferences, needs, and lifestyles

of this age group. By understanding the preferences and challenges faced by individuals in this age group, companies can develop innovative solutions and capture market share.

Most of the consumers have their income level above Rs.100,000. It can be a reason of positive attitudes towards the sustainable food products. With the higher income consumers tend to pay additional cost for healthy, environmentally friendly, sustainable products to gain long term benefits for them as well as the environment.

When the results in the first section were analysed, the consumer´s highest attention goes to packaging material, then packaging shape, size, colour, and lowest attention goes to packaging information. But in the second section highest attention goes to packaging information, then packaging colour, material, size, and lowest attention goes to packaging graphics. Packaging information shows totally different results according to two mentioned perspectives which indicate that normal shopping behaviour quickly ignore the information with the time constrains but in sustainable mind-set they ignore time constraints and consider the importance of packaging information. It suggests that proper education or guidance towards sustainability can be make more influences on human mind and their behaviours towards a sustainable world.

8. Conclusions

This chapter presents the conclusion drawn from the findings highlighted, the implication of the present paper and proposes research topics that can be investigated through further works.

8.1 Conclusions of the study

It's interesting to note that at some point, we have all purchased or considered purchasing packaged food products, making this study relatable to everyone. Although a representative sample was used, the findings have broad implications. This study highlights important managerial considerations. Managers should focus on the colour, material, and labelling (providing all relevant information) of the packaging, especially for products marketed with sustainability concepts (Malik & Bhargaw 2020).

Most food products in this industry are consumed by people of all age groups. In Sri Lanka, a significant portion of the population is young, and they tend to prioritize colour and product information more than the older population, who place greater importance on the health benefits of the product. Managers should adopt innovative packaging methods to meet the evolving demands of consumers, ensuring they identify and satisfy customer needs, which is the hallmark of a true marketer (Malik & Bhargaw 2020).

Packaging materials are transparent, multipurpose, reusable, and environmentally friendly, available in various sizes to minimize food waste. Many packages have attractive shapes that fit well with storage needs and are easy to handle. They also feature appropriate symbols and vivid colours that convey healthiness and sustainability. Additionally, detailed information on the packaging provides a sense of satisfaction to customers, making them feel confident about their choices. Each of these elements plays a crucial role in capturing consumers' attention and interest.

The current research also revealed that the primary factors attracting consumers are the main visual elements, such as the graphics and material of the package.

Meanwhile, colour and product information are the key verbal elements that influence the purchase of sustainable, eco-friendly products.

According to the results from the open-ended question in the questionnaire, respondents identified additional factors that influence their food purchases. Consumers also consider price, expiration dates, and product certifications. Most importantly, they prioritize the quality of the product. This includes the food's freshness, nutritional content, the amount of added preservatives, eco-friendliness, and sustainability. They also prefer reputable brands that align with their habits, storage needs, ease of handling, transportation distance, and specific requirements.

Based on this information, we can conclude that packaging information is the most critical factor in determining consumer attraction and brand loyalty, ultimately influencing purchasing decisions. Modern consumers are diverse and dynamic, with evolving expectations and preferences, which challenges brands to adapt and innovate to meet their changing needs.

Food producers and retailers should place a high priority on packaging within their marketing strategies. Overlooking or introducing sub packaging could result in product failure within the market. It's crucial to establish packaging standards and execute suitable strategies to safeguard and promote the product effectively. Manufacturers of new products frequently depend on labels to communicate essential details like manufacturing specifics, ingredients, and usage instructions, acting as valuable guides for consumers. Emphasizing the importance of this information during product promotion is vital, ensuring that consumers utilize it effectively.

Studies indicate that cultural disparities have a substantial impact on companies' packaging design strategies. For example, Ahmed *et al.* (2014) observed marked differences in packaging colour preferences between Western and Eastern nations. Hence, it's advisable for global companies to take cultural variations into account when crafting product packaging for diverse regions. It's essential for marketers in the industry not to regard packaging as the sole determinant of product success. They should also consider other critical marketing aspects when introducing new products or revitalizing existing ones.

8.2 Limitations

This research adopts a quantitative approach, aiming to gather concise responses without delving into detailed explanations. However, this approach may introduce

bias as respondents might lose interest or rush through the survey, providing superficial answers. To mitigate response bias, two key measures were implemented.

Firstly, the questions were designed to be simple and succinct, aligning with the recommendation by Crowther & Lancaster (2008) to facilitate quick survey completion without requiring respondents to ponder extensively or second-guess their responses. Secondly, the questions were kept relevant to ensure that respondents' time was not wasted on irrelevant issues, as suggested by the same source. These steps were taken to enhance the quality and reliability of the data collected.

Another limitation of this study is its origin from the Sri Lankan context and the utilization non-randomized sample. The convenience sampling was used to select participants due to time and resource constraints. However, this method is a limitation as it may not provide a representative sample of the entire population, thereby affecting the generalizability of the findings. The data collected might not be valid for making broad generalizations due to the non-random nature of the sample. The results are indicative of the sampled population's preferences and behaviors but may not accurately reflect the broader population of Sri Lanka or other regions.

8.3 Future research and recommendations

The study was suggested that future research use more robust sampling methods, such as random sampling, to enhance the representativeness of the sample. This would provide more reliable data for making broader generalizations about consumer behavior and preferences. This study examined consumer´s perceptions in a general manner without focusing on specific food items. This leaves room for future research to explore the impact of food packaging elements while specifying different types of food products to uncover potential differences. Additionally, while this study highlighted the relationship between packaging elements and consumer buying behaviour or sustainability buying behaviour, it did not analyse the relationships between individual packaging elements. For example, Chiang & Yu (2010) demonstrated a significant relationship between packaging colour and graphics, while Folkes & Matta (2004) highlighted the relationship between packaging shape and graphics. Therefore, future research should delve into analysing the relationships between each packaging element individually to gain a more comprehensive understanding of their impact on consumer behaviour. Furthermore, future researchers focusing on packaging should delve into additional

marketing factors and dimensions to gain a comprehensive understanding of the determinants of product success.

References

Abejon, R., Bala, A. & Vázquez-Rowe, I. (2020). 'Towards sustainable packaging design: A life cycle perspective on the impacts of packaging options for a cracker product', *Science of the Total Environment*, 702, p. 134767.

Aday, M., Yener, U. (2014). Understanding the buying behaviour of young consumers regarding packaging attributes and labels. *International Journal of Consumer Studies*, 38(4), pp. 385-393.

Ahmed, R., Parmar, V. & Amin, M. (2014). Impact of product packaging on consumer´s buying behaviour. *European Journal of Scientific Research*, 122, 125-134. https://doi.org/10.13140/2.1.2343.4885\

Ajzen, I. (1991). The Theory of Planned Behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179-211.

Ajzen, I. (2005). Attitudes, Personality, and Behavior (2nd ed.). *Open University Press.*

Ajzen, I., & Fishbein, M. (1980). Understanding attitudes and predicting social behaviour. *Prentice-Hall.*

Ali, S., Ahmad, S. F., Hussain, S., Ibrahim, M., & Noreen, A. (2015). Impact of product packaging on consumer perception and purchase intention. *Journal of Marketing and Consumer Research*, 10, 1-9.

Ampuero, O., & Vila, N. (2006). Consumer perceptions of product packaging. *Journal of Consumer Marketing*, 23(2), 100-112.

Arora N.K, Mishra I. (2019). United Nations sustainable development goals 2030 and environmental sustainability: race against time. Environ Sustain 2019;2:339–42. https://doi.org/10.1007/s42398-019-00092-y.

Aviat, F., Gerhards, C., Rodriguez-Jerez, J.-j., Michel, V., Bayon, I.L., Ismail, R., Federighi, M., (2016). Microbial safety of wood in contact with food: *a review. Compr. Rev. Food Sci. Food Saf.* 15 (3), 491e505. https://doi.org/10.1111/1541-4337.12199.

Balasubramanian, S., & Somasundaram, S. (2014). "Green packaging practices: An exploratory study of select firms in India." *Indian Journal of Science and Technology*, 7(S6), 57-67.

Bandura, A. (2001). Social Cognitive Theory: An Agentic Perspective. *Annual Review of Psychology*, 52(1), 1-26.

Baruk, A.I., Iwanicka, A., (2015). Polish final purchasers expectations towards the features of dairy product packaging in the context of buying decisions. *British Food Journal* 117, 178-194. https://doi.org/10.1108/BFJ-06-2014-0188\

Bautista, M.J.B., Calpotura, G.M.D. & Suallo, C.A. (2019). Impact of Packaging Attributes and Labels to the Buying Behaviour of Young Consumers. 5 (6)

Bicchieri, C. (2006). The Grammar of Society: The Nature and Dynamics of Social Norms. New York: *Cambridge University Press.*

Brink, H. I., & Woods, M. (1998). Research: How to plan, speak and write about it. *Juta and Company Ltd.*

Brovensiepen, J., Klein, J. & Biehl, J. (2018). 'The influence of packaging on consumer behavior in the food industry', *Journal of Consumer Marketing*, 35(3), pp. 273-284.

Bryman, A. (2007). Effective interviewing in social research. *Oxford University Press*.

Bryman, A. (2012). Social Research Methods. 4th ed. Oxford: Oxford University Press.

Carvalho, M., Oliveira, A., Pereira, B., & Silva, C. (2022). Influence of packaging material on consumer purchasing decisions: A study of food products. Food Packaging and Shelf Life, 33, 100782.

Cherrier, H., Jolibert, A., & Dion, D. (2011). Revisiting Green Marketing: A Comparative Study of French and Moroccan Consumers. *Journal of Business Research*, 64(2), 137-143. https://doi.org/10.1016/j.jbusres.2009.09.001

Chiang, C. T., & Yu, W. C. (2010). Research of female consumer behavior in cosmetics market case study of female consumers in Hsinchu Area Taiwan. *iBusiness*, 02(04), 348–353.

Clement, J. (2007). Visual influence on in-store buying decisions: an eye-track experiment on the visual influence of packaging design. *Journal of Marketing Management*, 23(9–10), 917–928.

Connelly, L. M. (2008). Pilot studies. Medsurg Nursing, 17(6), 411-412.

Connor, M. (1993). Predicting Health Behaviour: Research and Practice with Social Cognition Models. *Open University Press*.

Crippa M, Solazzo E, Guizzardi D, Monforti-Ferrario F, Tubiello FN, Leip A. (2021). Food systems are responsible for a third of global anthropogenic GHG emissions. Nat Food 2021;2:198–209. https://doi.org/10.1038/s43016-021-00225-9.

Crowther, D., & Lancaster, G. (2008). Research methods: A concise introduction to research in management and business consultancy. Butterworth-Heinemann.

Deliya, M.M. and Parmar, B.J. (2012). "Role of packaging on consumer buying behaviour", Global "*Journal of Management and Business Research*, Vol. 12 No. 10, pp. 48-68.

Eldesouky, A. & Mesias F. (2014). An insight into the influence of packaging and presentation format on consumer purchasing attitudes towards cheese: A qualitative study, *SPANISH JOURNAL OF AGRICULTURAL RESEARCH*, 12, 305-312. https://doi.org/10.5424/sjar/2014122-5520\

Engel, J.F., Blackwell, R.D. & Miniard, P.W. (1986). Consumer Behavior. 5th edn. Chicago: *Dryden Press*.

Fatima S, Lodhi S. (2015). Impact of advertisement on buying behaviours of the consumers: study of cosmetics industry in Karachi city. *International Journal of Management Sciences and Business*. 2015;4(10):125–137.

Folkes, V., & Matta, S. (2004). The effect of package shape on consumers' judgments of product volume: Attention as a mental contaminant. *Journal of Consume Research*, 31(2), 390–401.

Food - European Commission} (n.d.). https://competitionpolicy.ec.europa.eu/sectors/ agriculture/food_en [2024-01-21]

Fowler, F. J. (2014). Survey Research Methods (5th ed.) - Fowler discusses the principles and practices of survey research, highlighting its benefits in standardization and comparability.

Garber, L. L., Jr, Hyatt, E. M., & Starr, R. G., Jr (2000). The effects of food colour on perceived flavor. *Journal of Marketing Theory and Practice*, 8, 59–72.

George, J.F., (2004). The Theory of Planned Behaviour and Internet Purchasing. Internet Research, 14(3), pp.198-212.

Gidlof, K., Anikin, A., Lingonblad, M., Wallin, A., (2017). Looking is buying. How visual attention and choice are affected by consumer preferences and properties of the supermarket shelf. Appetite 116, 29e38. https://doi.org/10.1016/j.appet.2017.04.020.

GoldenwestAdmin (2023). How the Right Packaging Can Reduce Food Waste. *Golden West Packaging - Blog*. https://goldenwestpackaging.com/wp/how-the-right-packaging-can-reduce-food-waste/ [2024-02-27]

Gomez, M., Martín-Consuegra, D., & Molina, A. (2015). The importance of packaging in purchase and usage behaviour. *International Journal of Consumer Studies*, 39(3), 203–211

Grunert, K.G., Hieke, S. & Wills, J. (2014). Sustainability labels on food products: Consumer motivation, understanding and use. {Food Policy}, 44, 177 - 189. https://doi.org/10.1016/j.foodpol.2013.12.001\

Gu, S. (2019). Using the Theory of Planned Behaviour to Explain Customers Online Purchase Intention. 5, 226-249. https://doi.org/10.6911/WSRJ.201909_5(9).0026\}

Gustavsson, J., Cederberg, C., Sonesson, U., van Otterdijk, R., & Meybeck, A. (2011). "Global food losses and food waste: extent, causes and prevention." FAO Report, *Food and Agriculture Organization of the United Nations*.

Hallez, L., Vansteenbeeck, H., Boen, F. & Smits, T. (2023). Persuasive packaging? The impact of packaging colour and claims on young consumers perceptions of product healthiness, sustainability and tastiness. Appetite, 182, 106433. https://doi.org/10.1016/j.appet.2022.106433\

Hellström, D. & Olsson, A. (2016). 'Managing packaging design for sustainable development: A compass for strategic directions', Packaging Technology and Science, 29(5), pp. 225-246.

Holmes, M. R., & Paswan, A. K. (2012). The effect of packaging on consumers' perceptions of quality: Focus on food products. *Journal of Food Products* Marketing, 18(5), 372-394.

Homans, G. (1961). Social Behaviour: its elementary forms. London: Routledge and Kegan Paul.

Huang, L.-S., Huang, W.-J. & Wu, Y.-H. (2022). The effects of puffery in food packaging on consumers responses via persuasion knowledge: role of food type and picture type. *British Food Journal*, 125 (3), 937-955. https://doi.org/10.1108/BFJ-10-2021-1112\}

IBM Corp. (2022). IBM SPSS Statistics for Windows, Version 29.0. Armonk, NY: IBM Corp.

ISO (International Organization for Standardization). (2013). ISO 18604:2013 Packaging and the environment — Optimization of the packaging system. https://www.iso.org/standard/53263.html

Jäger, J.K., Piscicelli, L. (2021). Collaborations for circular food packaging: the set-up and partner selection process. Sustain. Prod. Consum. 26, 733–740.

Kahneman, D., & Tversky, A. (2016). Prospect Theory: An Analysis of Decision under Risk. Econometrica, 47(2), 263-291.

Kampfer, K., Leischnig, A., Ivens, B.S. and Spence, C. (2017), "Touch-flavor transference: assessing the effect of packaging weight on gustatory evaluations, desire for food and beverages, and willingness to pay", *Plos One*, Vol. 12 No. 10, pp. 1-17.

Kari, R. (2014). Rational Choice Theory: An Overview, *Journal of Life Science and Biomedicine*. 4(5):452-456.

Klaiman, K., Ortega, D.L., Garnache, C. (2016). Consumer preferences and demand for packaging material and recyclability. Resources, Conservation and Recycling, 115, pp. 1-8

Konstantoglou, A., Folina, D. and Fotiadis, T. (2020), "Investigating food packaging elements from a consumer's perspective", Foods, Vol. 9, pp. 1-17.

Köster, E. P. (2009). Diversity in the determinants of food choice: A psychological perspective. *Food Quality and Preference*, 20(2), 70-82. https://doi.org/10.1016/j.foodqual.2007.11.002

Kotler, P., & Keller, K. L. (2007). Marketing management (12th ed.). Pearson Prentice Hall.

Labrecque, L. I., Patrick, V. M., & Milne, G. R. (2012). The effect of product display and packaging on perceived quality. *Journal of Retailing*, 88(2), pp. 203-215.

Lamb, C. W. (2009). Essentials of marketing. Cengage Learning.

Licciardello, F. (2017). 'Packaging, waste and the environment', Environmental Impact of Products, 24(4), pp. 567-584.

Lindh, H., Olsson, A., Williams, H., (2016). Consumer perceptions of food packaging: contributing to or counteracting environmentally sustainable development? Packag. *Technol. Sci*. 29 (1), 3e23. https://doi.org/10.1002/pts.2184.

Neff, R.A., Spiker, M.L. & Truant, P.L. (2015). Wasted Food: U.S. Consumers Reported Awareness, Attitudes, and Behaviours. Wiley, A.S. (ed.) (Wiley, A. S., ed.) *PLOS ONE*, 10 (6), e0127881. https://doi.org/10.1371/journal.pone.0127881\}

Macena, M.R., Cardoso, M.V. & Silva, T.N. (2021). 'Consumer influence on the adoption of sustainable packaging: A case study in the food industry', *Journal of Cleaner Production*, 279, p. 123456.

Malhotra, N. K. (1999). Marketing research: An applied orientation (3rd ed.). *Prentice Hall*.

Malik, R. & Bhargaw, V. (2020). Packaging attributes influencing customers' purchase decision: A study of FMCG sector. *GIS-Business*, 15(71), pp. 8211-8279. https://www.researchgate.net/publication/372629854

Marsh, K., & Bugusu, B. (2007). "Food packaging—roles, materials, and environmental issues." *Journal of Food Science*, 72(3), R39-R55. DOI: 10.1111/j.1750-3841.2007.00301.x

Meyers-Levy, J., & Loken, B. (2015). "Revisiting Gender Differences: What We Know and What Lies Ahead." *Journal of Consumer Psychology*, 25(1), 129-149. DOI: 10.1016/j.jcps.2014.06.003.

Mont, O., Plepys, A., & Wennersten, R. (2014). An overview of the state of the art of perceptual studies in the field of sustainable consumption. *Journal of Cleaner Production*, 63, 9-19. https://doi.org/10.1016/j.jclepro.2013.05.032

Mugenda, O. M & Mugenda, A. G. (1999). Research Methods; Quantitative and Qualitative Approaches. Nairobi, Kenya: Africa Centre for Technology Studies (Acts) press

Ogle, D. M. (2004). Environmental concern: A conceptual and methodological review. *Journal of Environmental Psychology*, 24(4), 385-397. https://doi.org/10.1016/j.jenvp.2004.08.002

Otto, S., Strenger, M., Maier-Nuth, A., Schmid, M., (2021). Food packaging and sustainability, Consumer perception vs. correlated scientific facts: A review. *Journal of Cleaner Production* 298, 126733. https://doi.org/10.1016/j.jclepro.2021.126733\

Patwardhan, P. and Ramaprasad, J., (2005). Rational Integrative Model of Online Consumer Decision Making. *Journal of Interactive Advertising*, Fall issue, 6(1), pp. 2-13.

Petljak, K., Naletina, D. & Bilogrevic, K. (2019). Considering ecologically sustainable packaging during decision-making while buying food products. *Economics of Agriculture*, Year 66, No. 1, 2019, (pp. 107-126), Belgrade. https://doi.org/10.5937/ekoPolj1901107P\

Pohtam JR, Deka PK, Dutta C. Impact of packaging on consumer buying behaviour. *Journal of Management in Practice*. 2016;1(1):1–16. Available from: https://core.ac.uk/download/pdf/249336062.pdf

Prakash, G., & Pathak, P. (2017). "Intensifying Effects of Consumer Value, Food Safety and Health Concerns on the Purchase Intentions for Organic Food." *Journal of Retailing and Consumer Services*, 39, 335-344. DOI: 10.1016/j.jretconser.2017.08.002.

Prendergast, G., & Pitt, L. (1996). The role of packaging in strategic marketing. *Journal of Product & Brand Management*, 5(2), 4-17.

Rahman, P.N.A.A., Harun, R. & Johari, N.R. (2020). The Effect Of Packaging Design Elements On Youth Purchase Intention Of Junk Food. *JBMP (Jurnal Bisnis, Manajemen dan Perbankan*), 6 (1), 25-38. https://doi.org/10.21070/jbmp.v6i1.442\

Richardson, P.S., Dick, A.S. and Jain, A.K. (1994), "Extrinsic and intrinsic cue effects on perceptions of store brand quality", *Journal of Marketing*, Vol. 58 No. 4, pp. 28-36.

Riege, A. M. (2003). Validity and reliability tests in case study research: A literature review with "hands-on" applications for each research phase. *Qualitative Market Research: An International Journal*, 6(2), 75-86.

Rita K. (2009), impact of package elements on consumer purchase, Kauno technologijos universitetas, Lietuva, ekonomika ir vadyba.

Robin, A. (1977). Packaging as a marketing element. *Graficar štamparsko-izdavacko poduzece*, 1(2), pp. 116-128. Ludbreg, Croatia.

Rowley, J., & Slack, F. (2004). Conducting a literature review. Management Research News, 27(6), 31-39. https://doi.org/10.1108/01409170410783612

Rundh, B. (2009), "Packaging design: creating competitive advantage with product packaging", "*British Food Journal*, Vol. 111 No. 9, pp. 988-1002.

Šcedrov, O., & Muratti, Z. (2008). Packaging and environment protection. Sigurnost, 50(3), 287-297. [in Croatian: Šcedrov, O., & Muratti, Z. (2008). Pakiranje, ambalaža i zaštita okoliša].

Schifferstein, H. N., Fenko, A., Desmet, P. M., Labbe, D., & Martin, N. (2013). Influence of package design on the dynamics of multisensory and emotional food experience. *Food Quality and Preference*, 27(1), 18–25.

Schifferstein, H.N.J., Wehrle, T., Carbon, C.-C. (2019). Consumer expectations for vegetables with typical and atypical colours: the case of carrots. Food Qual. Prefer. 72, 98e108. https://doi.org/10.1016/j.foodqual.2018.10.002.

Schoormans, J.P.L. and Robben, H.S.J. (1997). "Effect of new package design on product attention, categorization and evaluation", *Journal of Economic Psychology*, Vol. 18 No 2/3, pp. 271-87.

Seo, S., Ahn, H.-K., Jeong, J., Moon, J., (2016). Consumers' attitude toward sustainable food products: ingredients vs. Packaging. Sustainability 8 (10). https://doi.org/10.3390/su8101073.

Seo, J. Y., & Scammon, D. L. (2017). Do green packages lead to misperceptions? The influence of package colours on consumers' perceptions of brands with environmental claims. Marketing Letters, 28(3), 357–369.

Shah S, Ahmed A, Ahmad N. Role of packaging in consumer buying behaviour. International Review of Basic and Applied Sciences. 2013;1(2):35–41. Available from: https://mbr.cikd.ca/article_60293_eb667b2b95c51d824f65a29fcbba05ff.pdf.

Shepherd, R., & Sparks, P. (1985). An analysis of the consumption of meat: Theoretical perspectives and empirical evidence. In M. J. Houston (Ed.), Advances in psychology research (Vol. 2, pp. 121-150). Nova Science Publishers.

Silayoi, P. and Speece, M. (2004). "Packaging and purchase decisions: an exploratory study on the impact of involvement level and time pressure", *British Food Journal*, Vol. 106 No. 8, pp. 607-628.

Silva, A.R., de, A., Bioto, A.S., Efraim, P., Queiroz, G., de, C., (2017). Impact of sustainability labeling in the perception of sensory quality and purchase intention

of chocolate consumers. J. Clean. Prod. 141, 11 21. doi:10.1016/j.jclepro.2016.09.024.

Smith, J., and Jones, L. (2019). "The Evolution of Consumer Behavior Studies: A Shift from Qualitative to Quantitative Approaches." *Journal of Consumer Research*, 45(3), 567-589. DOI: 10.1086/698761.

Spence, C. (2016). Multisensory packaging design: Colour, shape, texture, sound, and smell. Integrating the Packaging and Product Experience in Food and Beverages, 1–22. https://doi.org/10.1016/B978-0-08-100356-5.00001-2

Spence, C., & Velasco, C. (2018). On the multiple effects of packaging colour on consumer behaviour and product experience in the 'food and beverage' and 'home and personal care' categories. Food Quality and Preference, 68, 226–237. https://doi. org/10.1016/j.foodqual.2018.03.008

Srinivasan, S. & Lu, W.F. (2014). Development of a Supporting Tool for Sustainable FMCG Packaging Designs. Procedia CIRP, 15, 395\uc0\u8211{}400. https://doi.org/10.1016/j.procir.2014.06.079\}

Steg, L., & Vlek, C. (2009). Encouraging Pro-environmental Behaviour: An Integrative Review and Research Agenda. *Journal of Environmental Psychology*, 29(3), 309-317.

Steenis, N. D., van der Lans, I. A., van Herpen, E., & van Trijp, H. C. (2017). "Effects of sustainable design strategies on consumer preferences for redesigned packaging." *Journal of Cleaner Production*, 162, 286-298. DOI: 10.1016/j.jclepro.2017.06.056.

Stipanelov, V., & Vrandecic, N. (2010). Impact of sales packaging on product quality. Management, 15(1), 19-29

Suci, A., Maryanti, S., Hardi, H. & Sudiar, N. (2021). Willingness to pay for traditional ready-to-eat food packaging: examining the interplay between shape, font and slogan. *Asia Pacific Journal of Marketing and Logistics*, 34 (8), 1614\uc0\u8211{}1633. https://doi.org/10.1108/APJML-04-2021-0233\

Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. International Journal of Medical Education, 2, 53-55.

Teijlingen E. R. & Hundley V. (2001) The importance of pilot studies. Social research update. 2001;35. Available from: http://sru.soc.surrey.ac.uk/SRU35.html.

Testa, F., Iovino, R. & Iraldo, F. (2021). 'The circular economy and consumer behaviour: The mediating role of information seeking in buying circular packaging', Business Strategy and the Environment, 30(8), pp. 3645-3657.

Thompson, R. C., Moore, C. J., vom Saal, F. S., and Swan, S. H. (2009). "Plastics, the environment and human health: current consensus and future trends." Philosophical Transactions of the Royal Society B: Biological Sciences, 364(1526), 2153-2166. DOI: 10.1098/rstb.2009.0053.

UNEP (2014). Valuing plastics: The business case for measuring, managing and disclosing plastic use in the consumer goods industry. Nairobi: United Nations Environment Programme.

Unilever (2009). Sustainable packaging: A guide to using recycled PET in the production of plastic packaging. Unilever Sustainable Living Plan.

Van Ooijen, I., Fransen, M. L., Verlegh, P. W. J., & Smit, E. G. (2017). Signaling product healthiness through symbolic package cues: Effects of package shape and goal congruence on consumer behaviour. Appetite, 109, 73–82. https://doi.org/10.1016/j.appet.2016.11.021

Veflen, N., et al. (2023). The influence of multisensory packaging design on consumer perceptions. Journal of Packaging Technology and Research, 1-15.

Velasco, C., Woods, A. T., Petit, O., Cheok, A. D., & Spence, C. (2016). Crossmodal correspondences between taste and shape, and their implications for product packaging: A review. *Food Quality and Preference*, 52, 17–26. https://doi.org/10.1016/j.foodqual.2016.03.005

Venter, K., Merwe, D.V., Beer, H.D., Bosman, M. and Kempen, E. (2011). "Consumers' perceptions "of food packaging: an exploratory investigation in Potchefstroom, South Africa", *International Journal of Consumer Studies*, Vol. 35 No. 3, pp. 273-281.

Verghes k., Dewis H., (2007). Environmental innovation in industrial packaging: a supply chain approach. Int j. Prod. Res. 45 (18-19), 4381-4401

Vujkovic, I., Galic, K., & Vereš, M. (2007). Food packaging. Tectus, Zagreb. Croatia

Waheed, S., Khan, M.M. and Ahmad, N. (2018). "Product packaging and consumer purchase intentions", Market Forces, Vol. 13 No. 2, pp. 97-114.

Yin, R. K. (1994). Case study research: Design and methods (2nd ed.). Sage Publications.

Yin, R. K. (2009). Case study research: Design and methods (4th ed.). Sage Publications.

Yokokawa, N., Kikuchi-Uehara, E., Sugiyama, H., Hirao, M., (2018). Framework for analyzing the effects of packaging on food loss reduction by considering consumer behaviour. *Journal of Cleaner Production* 174, 26–34. https://doi.org/10.1016/j.jclepro.2017.10.242

Yokokawa, N., Amasawa, E., Hirao, M., (2021). Design assessment framework for food packaging integrating consumer preferences and environmental impact. Sustainable Production and Consumption 27, 1514-1525. https://doi.org/10.1016/j.spc.2021.03.027\

Popular science summary

Ever wondered what makes you reach for a particular product on the supermarket shelf? Well, a recent study conducted in Sri Lanka sheds light on the key factors influencing our purchasing decisions. Researchers dove deep into the world of food packaging, exploring how elements like material, size, shape, graphics, colour, and product information impact consumer behaviour.

The findings are fascinating. Turns out, the type of material used for packaging holds the most sway over our choices. Whether it's the sturdy feel of a cardboard box or the sleekness of a plastic container, packaging material significantly influences what ends up in our shopping carts.

But it doesn't stop there. The study also revealed a strong connection between packaging and sustainability. Consumers are increasingly mindful of the environmental impact of their purchases, and packaging plays a crucial role in this regard. Packaging material, colour, and information were identified as key drivers in motivating sustainable food consumption and reducing food waste.

Interestingly, packaging shape didn't seem to have a significant impact on sustainability behaviour. However, when it comes to convenience and usability, consumers are all about easy storage, opening, and reusability. These factors play a pivotal role in shaping our perceptions of a product's sustainability.

So, what does this mean for businesses? Well, it's clear that packaging is more than just a wrapper. It's a powerful tool for attracting consumers and driving sales. Companies need to pay close attention to packaging design and ensure it aligns with consumer preferences and sustainability goals.

In the end, while packaging is important, it's not the only factor determining a product's success. Marketers should consider a holistic approach, considering other crucial aspects of marketing. And for future research, let's not forget to explore the intricate relationships between different packaging elements and their impact on consumer behaviour.

So, the next time you're browsing the grocery aisles, take a moment to appreciate the thought and strategy behind that package on the shelf. It's not just a box or a bag – it's a silent influencer, guiding your choices and shaping the world of consumer behaviour.

Acknowledgements

Appendix 1

The Questionnaire

Role of Food Packaging: Consumer purchasing behaviour in Sri Lanka

Introduction

This study is conducted as a master thesis project at the Swedish University of Agricultural Sciences (SLU). The objective of this study is to find out customer perspectives on food packaging. The questionnaire consists of 4 main sections and 12 subsections. It will take approximately 10 minutes to fill out the survey. Thank you in advance for your participation in supporting this study.

If you have questions about this survey, please contact me, Prasadinee Wijesundara - aewi0003.stud@slu.se

Participation in this survey is voluntary and you can withdraw your consent at any time without giving a reason. All data collected in this survey will be treated anonymously and stored until this research project has been finished.

I would therefore kindly ask you to agree to the terms and conditions of participation:

◯ I have read and understood the presented information and agree to participate in this study.

◯ I don´t agree or don´t want to participate in the study.

A) GENERAL

a. Gender
   1.Male ( )   2. Female ( )   3.Prefer not to say ( )
b. Age

   1. 18-25   2. 26-30   3. 31-35   4.36-40   5. 41-45
c. What is your monthly personal income?

Below Rs 20,000 ( ) Rs 21,000-49,999   ( )   Rs 50,000-79,999 ( )   Rs 80,000 -99,999 ( ) Rs 100,000 or above ()

B) PACKAGING ELEMENTS AND CONSUMER'S BUYING BEHAVIOR IN SRI LANKA

1. How frequently do you purchase packaged foods?

Rarely ( )   Occasionally ( ) Sometimes ( ) Frequently ( ) Very Frequently ( )

2. Do you have prejudgement (positive/negative) towards a food product before an actual consumption?

Rarely ( )   Occasionally ( ) Sometimes ( ) Frequently ( ) Very Frequently ( )

3. What are the other most influence factors of your food purchase?
....

Indicate to what extent you agree to the following statements.
1=strongly disagree, 2=disagree, 3= neither agree nor disagree,4 = agree,
5=strongly agree

Influence of packaging material on purchase behaviour	1	2	3	4	5
4. The transparent nature of a glass packaging influence me to buy that product over other products					
5. Family or media influences me to buy products with plastic packaging since its more convenience, light weight, and low production cost					
6. I have a control over selecting food products based on their packaging material					
Influence of packaging size on purchase behaviour	**1**	**2**	**3**	**4**	**5**
7. Food packaging size significantly influences my purchasing decisions					
8. My family expect me to choose packaging size by thinking how often me/they use a particular product.					
9. I would like to select food products with large packaging sizes to gain advantage of cost saving per unit					
Influence of packaging shape on purchase behaviour	**1**	**2**	**3**	**4**	**5**
10. Food packaging shape significantly impacts my purchasing decisions					
11. Society/media encourages me to select food products with innovative packaging shapes or designs					
12. I have a control over selecting shape of the package based on the storage capacity of your refrigerator					
Influence of packaging image on purchase behaviour	**1**	**2**	**3**	**4**	**5**
13. The image of food packaging can influence me to select that product from the shelf					

	1	2	3	4	5
14. Graphic can encourage repeat purchases/referrals by making memorable impression about the product					
15. I have confident to select new brand only considering their inspiring packaging image					
Influence of packaging colour on purchase behaviour	**1**	**2**	**3**	**4**	**5**
16. The colour of a food packaging influences me to select that product from the shelf					
17. Society can influence me to attract for some packaging colors over others					
18. I have a control over food products based on their packaging color (example: red color for spicy/unhealthy products)					
Influence of packaging information on purchase behaviour	**1**	**2**	**3**	**4**	**5**
19. Food packaging information significantly impacts on my purchasing decisions					
20. My family expect you to check the nutrients and ingredient information on the package before purchasing					
21. I do not spend much time on food labels due to time pressure					

C) PACKAGING ELEMENTS AND FOOD SUSTAINABILITY IN SRI LANKA

Indicate to what extent you agree to the following statements.
1=strongly agree, 2=agree, 3= neither agree nor disagree,4 = disagree,
5=strongly disagree

Influence of packaging material on food sustainability	**1**	**2**	**3**	**4**	**5**
22. I believe that food packaging material significantly impacts to the environment					
23. My friends and family influence me to buy food items packaged in environmentally friendly materials					
24. I value sustainability and appreciate packaging that provides additional functionality beyond its initial purpose					
Influence of packaging size on food sustainability	**1**	**2**	**3**	**4**	**5**
25. I believe that small size packaging is more sustainable than large size packaging					
26. My family or peers expect you to choose food products with correct packaging size to minimize waste and promote sustainability					
27. Portion control packaging imposes limits on the freedom to eat as much as desired					

Influence of packaging shape/design on food sustainably	1	2	3	4	5
28. I believe that the shape/design of packaging can contribute to sustainable food consumption					
29. My family encourage me to buy food packaging with refilling facility					
30. I have control over some shapes/designs due to its easy of handling					
Influence of packaging image on food sustainability	1	2	3	4	5
31. Eco-friendly icons or nature-inspired imagery, fosters consumer awareness and engagement with sustainable products					
32. Society/media encourage me to select sustainable products using image and graphics in the package					
33. I have confident to make environmentally friendly purchasing decisions when presented with food packaging images featuring clear recycling symbols or natural landscapes					
Influence of packaging colour on food sustainability	1	2	3	4	5
34. Cool packaging colours (example: green, and blue) increases perceptions that food and drinks are healthy and sustainable					
35. My family/friends encourage me to buy products with cool colors					
36. I have control over warm colors due to the feeling of unhealthy or unsustainability (example: red, yellow, orange)					
Influence of packaging information on food sustainability	1	2	3	4	5
37. I am ready to pay price premium for the products with eco labels and organic certificates					
38. My family and friends encourage me to read sustainability information on packaging before purchase					
39. I feel confident in choosing sustainable eco friendly food products using labels or symbols present in the package					

40. How important is it for you to purchase food products that are produced using sustainable practices?

Not important at all () Somewhat important () Moderately important () Very important () Extremely important ()

41. How often do you prioritize purchasing locally sourced food products over those that are imported?

Never () Rarely () Sometimes () Often () Always

Thank you very much for your participation. Your support is highly appreciated.

Publishing and archiving

Approved students' theses at SLU are published electronically. As a student, you have the copyright to your own work and need to approve the electronic publishing. If you check the box for **YES**, the full text (pdf file) and metadata will be visible and searchable online. If you check the box for **NO**, only the metadata and the abstract will be visible and searchable online. Nevertheless, when the document is uploaded it will still be archived as a digital file. If you are more than one author, the checked box will be applied to all authors. You will find a link to SLU's publishing agreement here:

- https://libanswers.slu.se/en/faq/228318.

☐ YES, I/we hereby give permission to publish the present thesis in accordance with the SLU agreement regarding the transfer of the right to publish a work.

☒ NO, I/we do not give permission to publish the present work. The work will still be archived and its metadata and abstract will be visible and searchable.