

Descriptive Study: Consumers' Preferences for Eco-Friendly Packaging in the Food Industry

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Abstract

The growing environmental influence of traditional food coverings has led to a transference to eco-friendly options. Environment- friendly packaging, featured by the usage of reusable, non-toxic or dispensable substances and the reduction of waste through modest outline. This descriptive study inspects consumers' inclination for environment-friendly packaging in the food industry, concentrating on their consciousness levels, buying behavior, and readiness to pay for eco-friendly options. Facts were composed through organized questionnaires administered to an illustrative sample of consumers, and the results were examined to recognize key trends and affecting factors. Findings reveal that environmental consciousness, perceived product quality, and brand reputation remarkably shape consumer choices, while cost and convenience remain notable barriers. The study underlines the need for targeted awareness movements, competition-based pricing strategies, and policy actions to increase the adoption of sustainable packaging. These insights provide valuable direction for food manufacturers, retailers, and policymakers in encouraging eco-friendly consumption practices and promoting environmental stewardship in the food sector.

Keywords: Environment-friendly Packaging, Consumers' Inclination, Environmental Consciousness, Readiness to Pay, Eco-friendly Consumption, Food Industry

1. Introduction

The growing environmental challenges constituted by packaging waste have increased the international move towards eco-friendly solutions, especially in the food industry. Traditional packaging substances, often derived from non-compostable plastics, contribute substantially to contamination, landfill accumulation, and resource exhaustion. As a reaction sustainable wrapping has emerged as a feasible choice, offering degradable, reusable matter options that aim to reduce the environmental footprint of food production and consumption. Consumer inclinations play an important role in the prosperous adoption of environmentally responsible packaging. Buying patterns in the food industry is affected not only by quality of product and price but also by environmental consciousness, perceived convenience, and brand image. As knowledge of sustainability increases, it has become crucial for organizations to understand consumer attitudes and choices regarding eco-friendly packaging.

This study focuses on consumers' preferences towards environment- friendly packaging in the food industry, by specially concentrating on Kerala, where consumers' knowledge about sustainability is gradually growing.

2. Objectives

1. To recognize the level of knowledge among consumers with regard to environment-friendly packaging.
2. To examine the factors influencing consumers' choices for eco-friendly packaging.
3. To discover readiness of consumers to pay more for environment- friendly packaging.
4. To evaluate how branding and labelling impact consumer preferences for eco-friendly packaging.

3. Literature review

Consumer research on sustainable packaging

Consumer research on sustainable packaging distinguishes two packaging characteristics that influence consumer behaviour. The first is packaging attributes (Herbes et al., 2018; Ketelsen et al., 2020), such as recyclability, and the second, cues (Herbes et al., 2020; Ketelsen et al., 2020) such as logos or colours that consumers use to make inferences about the attributes (Dörnyei et al., 2022). The concepts of attributes and cues from consumer research are helpful for framing company views on consumer thinking. In this paper, we will focus on attributes.

Consumer research has shown that different attributes make a packaging 'sustainable' for consumers. These attributes, such as recyclability or biodegradability, are mostly linked to the end of packaging life. Partly, these attributes are connected to the beginning of packaging life, especially to raw materials. But attributes related to production or transport tend to be neglected (Herbes et al., 2018).

Past studies also looked into factors related to the consumer and have identified factors such as awareness (Martinho et al., 2015; Wensing et al., 2020) and attitudes, e.g. attitudes towards the environment and environmental problems (Martinho et al., 2015) as well as specific attitudes towards packaging waste and sustainable packaging (Martinho et al., 2015), shopping at retailers practicing sustainable grocery packaging (Su et al., 2021) and towards new products and brands (Testa et al., 2020).

Other important factors from past studies are norms towards sustainable packaging and recycling (Martinho et al., 2015) (Martinho et al., 2015; Moorthy et al., 2021) and knowledge (Moorthy et al., 2021), specifically, knowledge on the environmental benefits of sustainable packaging (Su et al., 2021).

While consumer research on packaging is abundant, research into how food company executives view consumers is rather scarce. Table S1 in the Supplementary Information gives a structured overview of nine relevant studies that we identified. In what follows, we give a condensed overview of the current state of knowledge.

Only one of the relevant studies (Ryynänen and Rusko, 2015) focuses solely on how packaging professionals view consumers. Professionals in this study mentioned the interaction between product, packaging, and packaging fashions; they emphasized that the interaction of consumers with packaging is embedded in everyday practices, as consumers experience packaging visually and by touching it. The strength of this study is to provide a deep and rich understanding of how packaging professionals see the interaction of consumers with packaging in daily life, which goes beyond the buying process. However, this study did not focus on sustainable packaging and did not involve interviewees from producing companies.

All other studies treat consumers merely as one of many factors that influence packaging strategies of companies or the success of packaging solutions.

Moreover, the samples of all studies comprise stakeholders from academia, politics, and NGOs in addition to experts from companies and design agencies. Too often, they are based on the statements of very few

producing companies (two brand owners out of 25 participants in the study by Bening et al. (2021), five food producers out of 17 experts in the study by Kleine Jäger and Piscicelli (2021), seven experts from food companies out of 17 interviewees in the study by Molina-Besch and Keszleri (2023), two producers out of 28 interviewees in the study by Steinhorst and Beyerl (2021) and no interviewees from manufacturers in Gustavo et al. (2018), Roy et al. (2023) as well as Ryyänen and Rusko (2015). This severely limits the opportunity to get a deeper understanding of the views of producing companies while our study focuses solely on industrial professionals.

For these two reasons, consumers only as one factor and no focus on participants from producing companies, the conceptual models of consumers presented are often superficial, or limited to specific issues.

Past studies reveal contradictory views held about consumers by industry. Experts in Steinhorst and Beyerl (2021), including experts from companies, did not see consumers as the most important change agents. Moreover, they clearly stated that other stakeholders, primarily from politics and business, are responsible for removing barriers and introducing incentives to make consumers change their behaviour. Interviewees in Roy et al. (2023) on the other hand saw them at the centre of the plastic problem because they do not practice correct waste-sorting behaviour but the interviewees also saw government as responsible to increase recycling through regulation. Packaging experts in Kleine Jäger and Piscicelli (2021) identified green consumers as potential drivers for reusable packaging, while retailers in Gustavo et al. (2018) saw consumers mainly as a risk in redesigning packaging for more sustainability. In their case, a bigger package containing a higher amount of product would mean less packaging per number of product units, but the higher price per package that comes with a bigger package could deter price-sensitive customers. The interviewees in Ma et al. (2020) portrayed consumers as a “double-edged sword” (Ma et al., 2020, p. 6) on a path towards zero plastic in FMCG packaging, since they are seen both as enablers, if educated properly about plastic packaging and its impact on the environment, and barriers because convenience is perceived to come first for consumers and many consumers are perceived not to care about the environment.

If, partly in contradiction with consumer research (see 2.1), a negative view of the consumer prevails, which some of the abovementioned studies suggest and which we will further explore in our study, this may lead to inertia on the part of food producing companies. This in turn may lead to them missing market opportunities for more sustainable packaging.

Experts from companies in several studies stated their belief that consumers are confused by the information on the packaging (Roy et al., 2023), especially with bioplastics (Bening et al., 2021; Molina-Besch and Keszleri, 2023). Consumer confusion about bioplastics concerns, in the experts' view, the fact that biodegradable packaging cannot simply be left in the environment to degrade and that it is often sorted wrongly by consumers (Molina-Besch and Keszleri, 2023) and may thus contaminate waste streams (Bening et al., 2021).

Further, consumer awareness (Steinhorst and Beyerl, 2021) and knowledge (Ma et al., 2020; Kleine Jäger and Piscicelli, 2021; Roy et al., 2023) need to be raised in the experts' view, especially on how to sort plastic packaging for recycling (Roy et al., 2023) or on the benefits of plastic reduction (Ma et al., 2020). Experts from these studies maintain that consumers choose packaging based on convenience (Chakori et al., 2022) and low price. Convenience pertains to buying to-go drinks or fruits and vegetables in plastic packaging (Ma et al., 2020), while more sustainable solutions like bringing your own bottle are less

convenient. Moreover, they are believed not to care about sustainability (Gustavo et al., 2018; Ma et al., 2020).

This way of thinking sees eco-driven packaging re-design as risking the loss of customers. Only those re-designs that yield a cost or convenience advantage are seen as feasible (Gustavo et al., 2018).

A look at the methods of the nine studies we identified reveals that all are qualitative, mostly using interviews as their data acquisition method and qualitative content analysis as their data analysis method. This is not surprising, first, because understanding company views of complex subjects such as the choice of packaging in detail is difficult to accomplish in a quantitative survey and second, it would be difficult for most researchers to identify and reach a large sample of packaging decision makers.

Theories are not widely used in this field: Five out of nine studies did not use any theories. One uses systems theory and network theory (Chakori et al., 2022) but not to explain the behaviour of companies and in one study, the authors developed their own theoretical framework including process steps and roles in collaborations between companies (Kleine Jäger and Piscicelli, 2021).

Regarding the measures, perceived quality was measured with three items adapted from Magnier et al. (2016), perceived expensiveness with two items adapted from Monnot et al. (2015), perceived environmental friendliness with three items adapted from Chen et al. (2015), perceived convenience with two items adapted from Steenis et al. (2018), and purchase intention with three items adapted from Steenis et al. (2018). As moderators, this study measured price sensitivity with three items adapted from Monnot et al (2015) and environmental behaviour with four items adapted from Kilbourne and Pickett (2008).

4. Methodology

A descriptive research method is used in this study. Structured questionnaire was distributed to 100 customers across urban and semi-urban places of Kerala for data collection. Purposive sampling technique is used. The questionnaire included sections on knowledge level, factors influencing consumers' choices, willingness to pay and impact of branding on consumers' preferences. Data analysis was conducted using SPSS software

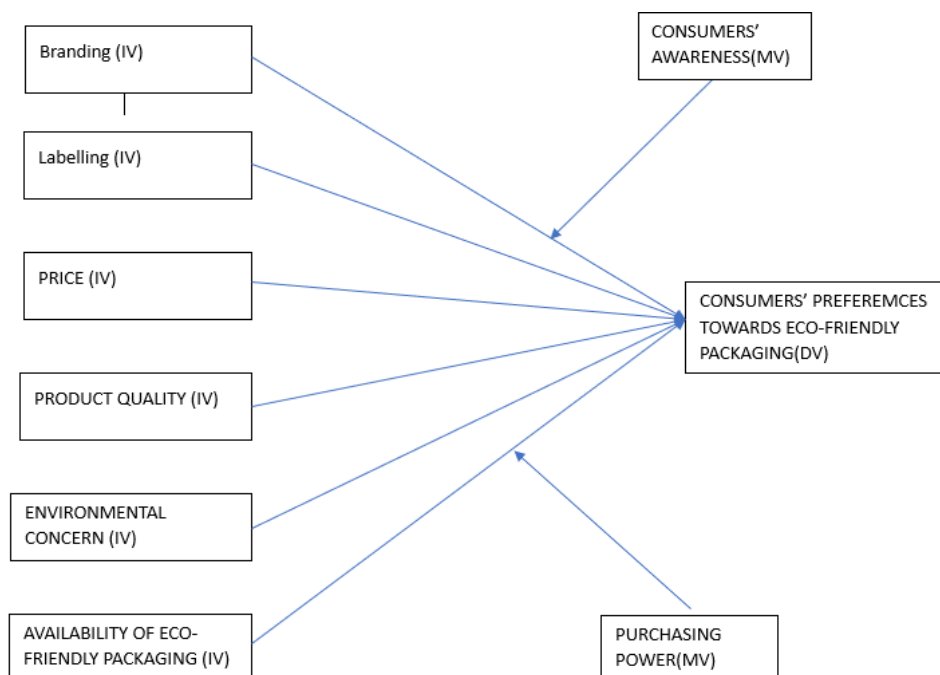


FIGURE 4.1

Interpretation: Figure 4.1 shows the conceptual model of the study, highlighting how different independent variables such as branding, labelling, price, product quality, environmental concern, and availability of eco-friendly packaging affect consumers' preferences for eco-friendly packaging. Consumers' awareness and purchasing power act as mediating variables, proposing that higher awareness and financial capacity can nourish the relationship between these factors and preferences of consumers. This framework shows that while multiple external forces drive choices of consumers, their eventual preferences for eco-friendly packaging is formed by how well-educated they are and their ability to afford such options.

TABLE 5.1

Results

		I am aware of the concept of eco-friendly packaging in the food industry.	I can easily identify eco-friendly packaging when purchasing food products.	I understand the environmental benefits of using eco-friendly packaging.	I regularly come across advertisements or campaigns about eco-friendly packaging.	My awareness of eco-friendly packaging has increased in recent years.
N	Valid	100	100	100	100	100
	Missing	0	0	0	0	0
Mean		3.8800	3.9100	2.9500	3.8800	3.9400
Median		4.0000	4.0000	3.0000	4.0000	4.0000
Std. Deviation		.59084	.51434	.35887	.59084	.42212

Interpretation: The descriptive statistics stipulate that consumers show a proportionate high level of knowledge regarding environment-friendly packaging in the food industry, as reflected in mean score close to 4 for options related to awareness, identification, and the growth of awareness in recent years. The low standard deviations further suggest that this awareness is equitably consistent across respondents. However, the mean score for understanding the environmental benefits of eco-friendly packaging is only 2.95, indicating a neutral stance and highlighting a notable gap between general awareness and in-depth understanding.

		I prefer eco-friendly packaging because it helps reduce environmental pollution.	The quality and durability of eco-friendly packaging influence my purchase decision	I choose eco-friendly packaging because it is safer for food storage	The design and appearance of eco-friendly packaging affect my buying decision.	Recommendations from friends, family, or social media influence my choice of eco-friendly packaging
N	Valid	100	100	100	100	100
	Missing	0	0	0	0	0
Mean		3.5800	3.0700	3.9700	3.6100	3.9100
Median		4.0000	4.0000	4.0000	4.0000	4.0000
Std. Deviation		1.04621	1.39447	.30000	1.01399	.51434

TABLE 5.2

Interpretation: Consumers actively prefer eco-friendly packaging for food safety (Mean = 3.97, SD = 0.30) and are also affected by social recommendations (Mean = 3.91, SD = 0.51) and environmental concerns (Mean = 3.58, SD = 1.05). Design and appearance show a moderate effect (Mean = 3.61, SD = 1.01), while quality and durability record the lowest preference (Mean = 3.07, SD = 1.39) with high variability. Overall, safety, social influence, and pollution reduction drive preference, but doubts about durability remain a barrier.

Statistics

		I am willing to pay a higher price for products with eco-friendly packaging.	I believe the extra cost for eco-friendly packaging is justified.	I would continue purchasing eco-friendly packaging even if prices increase slightly.	I prefer eco-friendly packaging over cheaper non-eco-friendly alternatives.	Price is not a major barrier for me when choosing eco-friendly packaging.
N	Valid	100	100	100	100	100
	Missing	0	0	0	0	0
Mean		3.8500	3.4000	3.6700	4.5000	4.6200
Median		4.0000	4.0000	4.0000	5.0000	5.0000
Std. Deviation		.65713	1.20605	.94340	1.25931	.91872

TABLE 5.3

Interpretation: Consumers strongly prefer eco-friendly packaging over cheaper alternatives (Mean = 4.50, SD = 1.26) and report that price is not a major barrier (Mean = 4.62, SD = 0.92). They are also willing to pay a higher price (Mean = 3.85, SD = 0.66) and continue purchasing even with slight price increases (Mean = 3.67, SD = 0.94). However, the belief that the extra cost is justified is weaker (Mean = 3.40, SD = 1.21), showing mixed opinions.

Statistics

		I trust brands that use eco-friendly packaging more than those that do not.	Labels indicating “eco-friendly” influence my purchase decision.	I believe brands using eco-friendly packaging are more socially responsible.	Attractive eco-friendly labels encourage me to choose those products.	I am more loyal to brands that promote sustainable packaging practices.
N	Valid	100	100	100	100	0
	Missing	0	0	0	0	100
Mean		4.5600	4.3000	2.8000	2.8200	2.8200
Median		5.0000	5.0000	3.0000	3.0000	3.0000
Std. Deviation		1.25786	1.38170	.77850	.57525	.57525

TABLE 5.4

Interpretation: Consumers show high trust in brands using eco-friendly packaging (Mean = 4.56, SD = 1.26) and are strongly influenced by eco-friendly labels when making purchases (Mean = 4.30, SD = 1.38). In contrast, perceptions of social responsibility (Mean = 2.80, SD = 0.78), attractive label appeal (Mean = 2.82, SD = 0.58), and brand loyalty (Mean = 2.82, SD = 0.58) are relatively low. Overall, eco-friendly

packaging builds trust and shapes purchase decisions but does not strongly drive loyalty or responsibility perceptions.

5. Conclusion

Based on the findings, the study concludes that consumers show strong awareness of environment-friendly packaging and generally recognize its significance in reducing pollution, enhancing food safety, and supporting sustainable practices. While elements like trust in eco-friendly brands, social impact and readiness to pay more positively form consumer choices, gaps remain in their deeper insight of environmental benefits, perceptions of product durability, and the extent to which branding, labelling, and design convert into loyalty or long-term commitment. Overall, the results highlight that environment-friendly packaging is assessed and preferred, but businesses must focus on improving consumer education, addressing quality concerns, and building stronger emotional connections through branding and labelling to enhance adoption and sustained loyalty.

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