

From waste to taste: understanding consumer perceptions and marketing strategies for edible food packaging

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Abstract

Purpose – Traditional packaging materials in the foodservice industry contribute significantly to unrecyclable municipal solid waste. This study aims to explore edible food packaging as a sustainable alternative and examine the factors influencing its adoption, including perceived value and additional costs.

Design/methodology/approach – Two studies were conducted to evaluate consumers' perceptions of edible food packaging. Study 1 examined the effect of food type (hedonic vs. utilitarian) on consumers' purchase intentions. Study 2 explored the interaction effects between food type and pricing strategies (partitioned vs. combined pricing) on purchase intentions. Both studies also tested the mediating role of perceived green value.

Findings – Both Study 1 and 2 revealed that consumers demonstrated higher purchase intentions for food products wrapped in edible packaging when presented with hedonic food options compared to utilitarian ones. Additionally, the study 1 identified perceived green value as a mediator between food type and purchase intention. The findings of study 2 demonstrated that partitioned pricing enhanced purchase intentions for utilitarian food options, compared to combined pricing strategies. Furthermore, the moderated mediation analysis revealed that green perceived value mediates the interactional effect between pricing strategy and food type on purchase intention.

Originality/value – This study contributes to the understanding of consumer behavior toward sustainable food packaging by identifying the roles of food type, pricing strategies and perceived green value. It provides guidance for industry professionals and academic researchers interested in sustainable innovations in the foodservice sector.

Keywords Edible food packaging, Solid waste reduction, Utilitarian and hedonic food, Combined and partitioned pricing, Purchase intention, Perceived green value

Paper type Research article

1. Introduction

The hospitality and foodservice industry play a key role in shaping consumer experiences and is uniquely positioned to address one of today's most challenging environmental issues: packaging waste. Packaging and containers used in food and beverage services contribute significantly to municipal solid waste from restaurants, hotels, and other foodservice establishments. According to the United States Environmental Protection Agency (EPA), containers and packaging accounted for 82.2 million tons of solid waste in 2018, representing 28.1% of total waste (United States EPA, 2023). Materials like glass, steel, aluminum, paper, plastic, and wood are essential for food quality and safety but a significant amount, particularly glass, aluminum, and plastics, ends up in landfills despite efforts to promote recycling (Antón



and Alonso-Almeida, 2019). The limited success of recycling programs highlights the need for innovative solutions in foodservice operations (Martin-Ríos *et al.*, 2018).

In response to these concerns, edible food packaging has emerged as a promising alternative that addresses waste reduction while aligning with sustainability goals in the hospitality and foodservice sectors. Edible packaging refers to the use of edible materials to wrap food or beverages (Zhao *et al.*, 2021). For example, Manchester City Football Club of the English Premier League introduced 100% recyclable, plastic-free beer cups and trialed edible coffee cups in its sustainability efforts (Wong, 2021). This concept offers foodservice operators a way to integrate packaging into the dining experience while minimizing environmental impact (Mazac and Tuomisto, 2020). Although the edible packaging industry is projected to reach a market value of \$2.14 billion by 2030 (Market Future Research, 2021), adoption remains limited due to concerns about cost, safety, and consumer acceptance (Iverson, 2021). For example, while sustainable packaging provides eco-friendly benefits, the additional costs associated with edible packaging may lead to consumer resistance (Allison *et al.*, 2021). Other concerns include taste, safety, and practicality, particularly in fast-paced foodservice industry (Horská *et al.*, 2021). However, previous studies indicate that edible packaging does not compromise food taste or safety (Horská *et al.*, 2021; Saha *et al.*, 2021). Therefore, edible packaging is a feasible solution for reducing packaging waste in the foodservice industry.

This study explores how the foodservice sector can leverage edible packaging to enhance sustainability efforts while optimizing marketing strategies. By examining consumer behavior toward edible packaging in foodservice contexts, this study contributes to understanding the factors influencing consumer acceptance of sustainable packaging. One key factor is the intrinsic nature of food products. Previous study suggests that consumer evaluations are shaped by intrinsic factors, such as whether the product is perceived as hedonic (pleasure-focused) or utilitarian (function-focused) (Babin *et al.*, 1994). Grounded in Dual-Process Theory (Stylos, 2022), which posits that consumer decision-making involves both intuitive (System 1) and rational (System 2) processes, this study examines how hedonic and utilitarian food products influence consumer reactions to edible packaging through different cognitive processes.

While much of the existing research has focused on packaging materials and their impact on consumer behavior (Mihalca *et al.*, 2021; Zhang *et al.*, 2021), only a few studies have touched on consumer responses to edible packaging, such as Horská *et al.* (2021) on acceptability among younger consumers and Saha *et al.* (2021) on perceptions of safety and material types. More recently, Weisstein *et al.* (2023) explored consumer evaluations of sustainable foods, and Lombardi *et al.* (2023) examined the emotional influence of eco-packaging in organic food contexts. However, to date, no published work has directly investigated how food type (hedonic vs. utilitarian) shapes consumer responses to edible packaging, especially within hospitality settings where sensory and emotional appeal are central (White *et al.*, 2019). This scarcity highlights the timeliness and relevance of the present study. Thus, this study investigates the role of food type in shaping consumer perceptions and purchase intentions regarding edible packaging within hospitality settings. It also seeks to explore whether consumers' perceptions of environmental benefits, specifically green perceived value, play a significant role in shaping their intentions to purchase food with edible packaging.

Pricing strategies are also critical in adopting sustainable products (Li and Kallas, 2021), such as edible packaging in hospitality. Reports suggest that additional costs associated with sustainable packaging can be a barrier to consumer acceptance (Iverson, 2021). To address these issues, we designed two experimental studies. Study 1 tests the effect of food type (hedonic vs. utilitarian) and the mediating role of perceived green value on consumers' purchase intentions. Study 2 builds on these findings by introducing pricing tactics, examining how combined and partitioned pricing strategies (Morwitz *et al.*, 1998) interact with food type to shape purchase intentions. Together, these studies provide a comprehensive understanding of how both product attributes and marketing strategies influence consumer acceptance of edible packaging.

The purpose of this study was to reveal the optimal way to promote consumers' purchase of food products with edible food packages. The research objectives are threefold: (1) to examine the effects of food type (utilitarian vs. hedonic) on consumers' purchase intentions for foods with edible packages; (2) to test the role of pricing strategies (partitioned vs. combined) in promoting different types of foods (utilitarian vs. hedonic) with edible packages; and (3) to investigate the mediating role of green perceived value. The findings contribute to academia by shedding light on the influence of food type and pricing tactics on consumer purchase intentions regarding edible packaging. These insights inform researchers in consumer behavior and sustainability and provide actionable guidance for the hospitality industry aiming to promote edible packaging adoption. This could lead to more effective marketing strategies and sustainable packaging initiatives tailored to consumer preferences and environmental concerns.

2. Literature review

2.1 Edible food packaging in foodservice industry

The concept of edible food packaging has become a solution to relieving the environmental challenges associated with traditional packaging materials in the foodservice industry (Díaz-Montes and Castro-Muñoz, 2021). Edible packaging involves the use of edible materials to wrap food products so that the need for non-biodegradable packaging and waste generation will be reduced. This innovative approach not only integrates food with packaging but also offers a sustainable alternative that aligns with the increasing consumer demand for eco-friendly practices within the foodservice industry (Díaz-Montes and Castro-Muñoz, 2021).

The adoption of sustainable packaging alternatives has been driven by growing concerns over plastic pollution and its consequences on ecosystems and human health (Vadera and Khan, 2021). Traditional packaging materials used in foodservice industry, such as plastic, contribute significantly to environmental degradation, with a large amount of plastic waste ending up in landfills or polluting oceans (U.S. Environmental Protection Agency, 2015). Edible packaging could be a solution to this problem by providing a biodegradable and edible alternative that reduces the environmental footprint of packaging waste (Ru *et al.*, 2020). Moreover, edible food packaging offers additional benefits beyond environmental sustainability, including enhanced freshness and shelf life of food products, food waste reduction, and added nutritional value through functional ingredients (Valencia-Chamorro *et al.*, 2011). Edible packaging also potentially offers opportunities for creative packaging designs that could drive product differentiation and consumer engagement (Shukla *et al.*, 2022).

Recent research has begun to explore consumer acceptance of edible packaging more directly. For example, Horská *et al.* (2021) examined acceptability among young consumers, while Saha *et al.* (2021) reviewed perceptions of different edible packaging materials. Building on this, Taylor *et al.* (2024) conducted sensory acceptance tests of edible muffin liners, fruit-leather wraps, and powdered-drink sachets, reporting high liking scores and purchase intent among consumers. Similarly, Zhang *et al.* (2024) applied diffusion of innovation and planned behavior frameworks to show how consumer innovativeness, attitudinal ambivalence, and subjective norms influence acceptance of edible packaging. These findings underscore both the opportunities and complexities of promoting edible food packaging in real-world contexts.

Complementary reviews also emphasize recent advances in materials and technology. Kumar *et al.* (2022) highlighted progress in edible films, detailing formulation methods, barrier properties, and application potential. Nair *et al.* (2023) provided an overview of edible packaging systems, discussing technological innovations, sustainability benefits, and market trends. More recently, Meshram *et al.* (2025) developed Kodo millet-based edible cups, a novel approach leveraging underutilized grains to create biodegradable and structurally resilient packaging. Collectively, these developments show a growing interest in edible

packaging solutions, though their integration into mainstream hospitality and foodservice operations remains limited.

Despite these advances, significant challenges remain. Barriers such as cost, sensory expectations, and food safety continue to hinder widespread adoption (Horská *et al.*, 2021; Iverson, 2021). Moreover, while the literature has begun to examine consumer acceptance in general, very few studies have considered how contextual factors, such as the type of food (hedonic vs. utilitarian), may shape perceptions of and intentions toward edible packaging. Addressing this gap is crucial in hospitality and foodservice settings, where consumer decisions are strongly tied to sensory and emotional experiences with food. Therefore, this study investigates the factors influencing consumer intentions to purchase food products with edible packaging, with a focus on the interplay between food type, pricing strategies, and perceived green value.

2.2 Dual-process theory

The dual-process theory posits that individuals use two cognitive pathways—rational and emotional—when processing information and making decisions (Stylos, 2022). The rational pathway involves deliberate evaluation, while the emotional pathway is more intuitive (Lin, 2021). For example, in a context of a luxury watch purchasing, consumers may both evaluate its features and be influenced by the brand's emotional appeal. This theory underscores the need to consider both cognitive routes in understanding consumer behavior, as it recognizes the simultaneous influence of rational and emotional factors on decision-making (Stylos, 2022).

In this study, dual-process theory provides a framework to explore how factors such as food type (utilitarian or hedonic) and pricing strategies (partitioned or combined) shape consumer behavior. It has been widely applied in hospitality contexts, including tourism (Stylos, 2022) and online reviews (Kwon *et al.*, 2021), and has also been used to examine sustainable behaviors in tourism (Han, 2021), textiles (Rakib *et al.*, 2022), and waste management (White *et al.*, 2019). This framework aligns with the complexity of consumer decision-making, particularly in relation to food type and its impact on purchase intentions. By considering both cognitive pathways, researchers can better understand how rational evaluations and emotional responses interact to shape purchase intentions toward edible packaging. Moreover, dual-process theory supports investigating green perceived value as a mediator and pricing strategy as a moderator in the relationship between food types and purchase intentions. Consumers engaging in rational thinking may carefully evaluate the environmental benefits (i.e. green perceived value) of edible packaging, particularly with utilitarian food products, where environmental impacts are more salient. On the other hand, emotional processing can enhance the perceived green value of edible packaging, especially for hedonic food products, where sustainability adds an appealing emotional dimension to the consuming behaviors.

In summary, dual-process theory offers a robust lens to examine the effects of food type on purchase intentions and the roles of perceived green value and pricing strategy. By accounting for both rational and emotional pathways, the theory deepens our understanding of consumer behavior and provides a solid foundation for the proposed research.

2.3 The effect of food type

Hedonic and utilitarian foods are common concepts in consumer behavior studies within the foodservice and hospitality industries (Kim *et al.*, 2023; Ozturk *et al.*, 2016). Hedonic foods are chosen for sensory pleasure and enjoyment, while utilitarian foods are consumed for their practicality and functionality in meeting basic nutritional needs (Zhou *et al.*, 2021). For instance, in organic food consumption, utilitarian motives relate to functional aspects like health benefits, while hedonic motives focus on sensory pleasure (Kushwah *et al.*, 2019). Consumers evaluate these food types differently, with hedonic foods often linked to emotional responses and utilitarian foods to rational decision-making (Dhar and Wertenbroch, 2000;

Weisstein *et al.*, 2023). For example, based on an experimental design in Weisstein *et al.* (2023) study, chocolate brownies are viewed as hedonic, while whole grain granola is considered utilitarian.

In addition, Kivetz and Zheng (2016) argued that, in general, promoting hedonic aspects of a product will be more likely to encourage consumers' purchasing behavior as long as the reasons for justifying their hedonic purchase are highlighted because consuming hedonic products may lead to guilt (Weisstein *et al.*, 2023). To reduce such feelings of guilt, individuals who consume hedonic products often actively seek reasons to justify their purchasing behavior (Keinan *et al.*, 2016). Pelozo *et al.* (2013) argued that consumers' guilt caused by indulgent products can be alleviated by pro-ethical consumption. Edible food packages are considered pro-environmental products that reduce the use of plastics and non-recyclable materials (Puscaselu *et al.*, 2019). Therefore, in this study, even though consumers foresee the guilt caused by consuming hedonic food (tasty chocolate brownie), the pro-environmental aspect of edible food packaging can significantly reduce the guilt, leading to a stronger intention to purchase the product. Therefore, this study hypothesizes that:

- H1. Compared with utilitarian food, hedonic food with edible packages leads to higher consumer purchase intention.

2.4 The moderating effect of pricing strategies

In the current market, the price of food products and the packaging are displayed as a combined price or partitioned price. Bertini and Wathieu (2007) illustrated that combined pricing can be presented as a single total price, for example, "\$215 including in-flight entertainment (6 movie channels) and a full-service meal", whereas partitioned pricing splits the total into separate components, such as "\$205 + \$10 for in-flight entertainment (6 movie channels) and a full-service meal" (pp. 22). Pricing strategy, combined or partitioned pricing, has been explored in determining its influence on consumers' behaviors in the field of hotel management (Repetti *et al.*, 2015; Zhang and Tang, 2024), brand mandate (Ferguson *et al.*, 2017), retailing (Burman and Biswas, 2007), and product sales (Das and Roy, 2019). However, studies on pricing strategies promoting food items, especially in the realm of sustainable food promotion, are lacking.

Partitioned pricing, by explicitly highlighting the costs of the food product and its packaging separately, is likely to enhance the transparency of the value for consumers (Repetti *et al.*, 2015), particularly in the context of utilitarian food items. Utilitarian products, often characterized by their practicality and necessity, may prompt consumers to evaluate the costs more carefully and to seek assurance that the cost aligns with perceived utility (Burman and Biswas, 2007). Therefore, the transparency offered by partitioned pricing may raise concerns regarding cost allocation of the product, as well as foster a sense of justifiability in the purchase decision. Furthermore, by emphasizing the separate cost of packaging, partitioned pricing draws attention to the additional environmental advantage linked with selecting sustainable packaging options, potentially strengthening consumers' perceived value proposition. Consequently, consumers may perceive utilitarian food products wrapped in edible packaging under partitioned pricing as both economically and environmentally rational choices. As a result, higher purchase intention is triggered compared to the combined pricing strategy.

On the other hand, hedonic food products, characterized by their indulgent flavors, textures, and esthetic appeal, inherently meet consumers' desire for sensory satisfaction (Ryu *et al.*, 2010). As such, consumers may exhibit a predisposition towards these products regardless of the pricing strategy, because they are likely to prioritize hedonic pleasure over rational cost considerations. Moreover, as mentioned earlier, previous studies suggest that individuals tend to justify their hedonic purchases using pro-environmental values (Keinan *et al.*, 2016; Pelozo *et al.*, 2013), leading them to place greater value on hedonic attributes when

making purchase decisions. Therefore, the hedonic food type leads to a greater purchase intention regardless of how the price is formatted.

H2. There is a two-way interaction between food type (utilitarian vs. hedonic) and pricing strategy (combined vs. partitioned) on purchase intention.

H2a. When combined utilitarian food type with partitioned pricing, a higher purchase intention are triggered

H2b. the Hedonic food type leads to a purchase intention regardless.

2.5 The moderated mediating effect of green perceived value

Within the theoretical framework of this study, hedonic food types tend to elicit higher purchase intentions overall, partly due to their emotional appeal. In contrast, utilitarian food types generate higher purchase intentions only under specific conditions, most notably when paired with partitioned pricing. This study proposes that perceived green value serves as a key explanatory mechanism for these effects, and its influence varies depending on both food type and pricing strategy.

Specifically, consumers considering utilitarian food products often adopt a rational mindset that emphasizes practical and environmental values (Weisstein *et al.*, 2023). Partitioned pricing reinforces this rational evaluation by itemizing the cost of each component, such as the edible package, thereby signaling transparency and a stronger commitment to sustainability. This clarity enhances perceived green value, which in turn increases purchase intention. (see Figure 1)

Meanwhile, for hedonic food products, emotional appeal plays a dominant role. Hedonic consumption may trigger feelings of guilt due to its indulgent nature (Keinan *et al.*, 2016; Pelozo *et al.*, 2013). However, the inclusion of an edible, eco-friendly package allows consumers to justify their indulgence through pro-environmental reasoning. This perceived green value helps alleviate guilt, activating the rational pathway and reinforcing the intention to purchase. Thus, this study hypothesizes that:

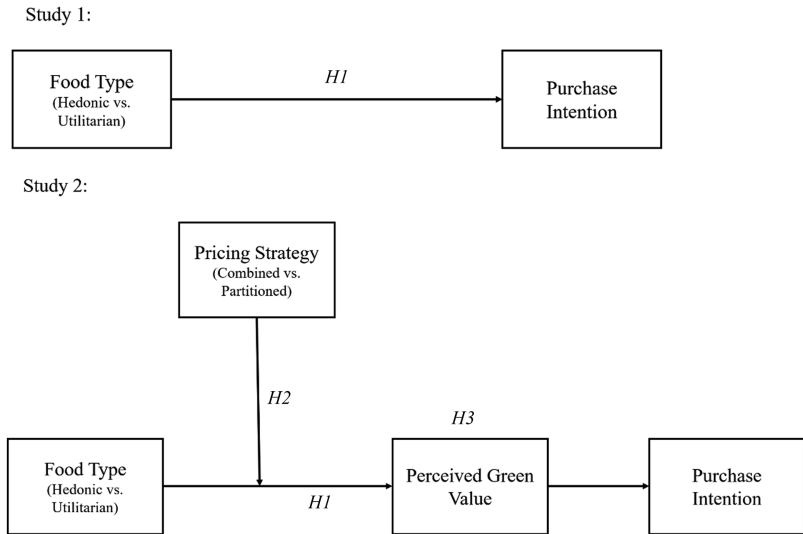


Figure 1. Research model. Source: Authors' own work

- H3. There is a moderated mediating role of green perceived value on the two-way effect between food type and pricing strategy on consumers' purchase intention toward food within edible food packages.

3. Study 1

The aim of Study 1 is to test the main effect of food type (utilitarian vs. hedonic) on customers' purchase intention toward purchasing food products with edible packaging (H_1). This study employed a single factorial experimental design to test the main effect of food type, using two different messages (utilitarian [whole grain granola] and hedonic [chocolate brownie]) designed to manipulate food type. In line with the study by [Weisstein et al. \(2023\)](#), this study utilized chocolate brownies in the hedonic condition and whole grain granola in the utilitarian condition.

3.1 Method

3.1.1 Stimuli and experimental procedure. Two messages were developed to depict the hedonic and utilitarian food products with edible packaging (see [Appendix A](#)). Each message was integrated into a shopping scenario: "Imagine yourself dining at a restaurant that also features a bakery displaying an array of baked goods. You decide to take a look, and you come across a specific bakery item along with its description and the corresponding price shown below." In the hedonic condition, a chocolate brownie wrapped in edible packaging was presented. In contrast, the utilitarian condition featured a whole-grain granola bar wrapped in edible packaging.

An online survey was used for data collection. Before answering the survey questions, participants were required to review a consent letter containing information about the purpose of the study, confidentiality protections, methods of data storage and usage, and potential risks (e.g. minimal risk of privacy loss) associated with participating in the survey. These risks were considered negligible given that anonymity and confidentiality were strictly maintained in accordance with IRB guidelines. Participants who chose "Agree" proceeded to the survey questions, while those who selected "Disagree" had their survey session closed. The research team confirms that this study complies with ethical guidelines for research involving human subjects by ensuring participant anonymity and confidentiality were upheld at all times. This study's research procedures received IRB-exempt approval from the IRB department of a university located in Southern United States.

At the survey's outset, a screening question ("Have you purchased food products from grocery stores, coffee shops, or any other food retailers in the past 6 months?") was included to identify eligible participants with recent food shopping experiences. Subsequently, participants were presented with a food shopping scenario, followed by one of two messages (either chocolate brownie or whole grain granola). After reviewing the scenario and message, participants were directed to respond to two manipulation check questions gauging the perceived hedonic or utilitarian attributes of the assigned food product ([Weisstein et al., 2023](#); [Choi et al., 2020](#)), along with the assessment of dependent variables, a control variable, and demographic information.

3.1.2 Pretest. A pretest involving 56 participants was conducted to assess the effectiveness of manipulating food types. Data were collected through Prolific. The results of a one-way analysis of variance (ANOVA) revealed that participants in the hedonic condition were more inclined to perceive the chocolate brownie as a hedonic food ($M_{ChocolateBrownie} = 5.35$, $SD = 1.59$) compared to the utilitarian condition ($M_{WholeGrainGranola} = 4.54$, $SD = 1.38$; $F = 4.14$, $p < 0.05$). Conversely, participants in the utilitarian condition were more likely to consider the whole grain granola as utilitarian ($M_{WholeGrainGranola} = 5.15$, $SD = 1.29$) compared to the hedonic condition ($M_{ChocolateBrownie} = 2.87$, $SD = 1.18$; $F = 46.55$, $p < 0.001$). Therefore, the manipulation of food type was deemed successful. Moreover, the mean score for the realism check items was 5.37 ($SD = 1.32$). The mean difference in realism check items between the

two experimental conditions was not statistically significant ($F = 0.41, p = 0.53$). Hence, the experimental scenarios were considered realistic.

3.1.3 Measurement. All measurement items were adapted from previous studies and slightly modified to suit this study. Specifically, participants' purchase intention was measured by using three items ($\alpha = 0.97$; [Shen et al., 2022](#)). All items were rated on a 7-point Likert scale ($1 = \text{strongly disagree}$; $7 = \text{strongly agree}$). Demographic questions were included at the end of the survey. [Appendix B](#) displays the measurement items.

3.1.4 Sampling and data analysis. The target population of this study comprises food shoppers in the United States. The survey was limited to individuals aged 18 or older, residing in the United States, and having recent food shopping experiences within the past six months. Data collection was conducted via Prolific, resulting in a total sample size of 118 ($N_{\text{ChocolateBrownie}} = 60$; $N_{\text{WholeGrainGranola}} = 58$). Among the participants, over half were aged between 21–40 years old; 55.93% were female; 77.97% were Caucasian; almost half held bachelor's degrees or above; 29.66% earned \$25,000–\$49,999; and 48.31% had full-time jobs ([Table 1](#)). After data collection, a one-way analysis of covariate (ANCOVA) was used to examine the main effect of food type on consumers' purchase intention ([H1](#)). PROCESS model 4 was used to test the mediation effect of perceived green value between food type and purchase intention ([H3](#)).

3.2 Results

3.2.1 Manipulation and realism checks. The results of the one-way ANOVA showed that participants in the hedonic condition perceived the chocolate brownie as a more hedonic food ($M_{\text{ChocolateBrownie}} = 5.85, SD = 1.26$) compared to those in the utilitarian condition ($M_{\text{WholeGrainGranola}} = 4.40, SD = 1.66$; $F = 48.43, p < 0.001$). Additionally, participants in the utilitarian condition tended to perceive the whole grain granola as a more utilitarian food ($M_{\text{WholeGrainGranola}} = 4.95, SD = 1.28$) than those in the hedonic condition perceived the chocolate brownie ($M_{\text{ChocolateBrownie}} = 3.30, SD = 1.32$; $F = 47.26, p < 0.001$). The mean score of the realism check items was 5.32 ($SD = 1.33$).

3.2.2 One-way ANCOVA ([H1](#)). A one-way ANCOVA was conducted to test the main effect of food type on purchase intention toward the edible food package. Consumer confidence and past experience with consuming edible food packages were utilized as the control variables as those factors have been identified as important predictors of sustainable consumption behaviors and can influence the antecedents of such behaviors ([Kim and Chung, 2011](#); [Kumar and Yadav, 2021](#)). The results (shown in [Table 2](#)) showed that participants in the chocolate brownie condition ($M_{\text{ChocolateBrownie}} = 4.75, SE = 0.24$) reported a higher level of purchase intention than those who received the whole grain granola condition ($M_{\text{WholeGrainGranola}} = 3.92, SE = 0.24$; $F = 5.99, p = 0.02$). Therefore, [Hypothesis 1](#) was supported.

4. Study 2

The aim of Study 2 has three folds: (1) test the two-way interaction between food type and pricing strategy ([H2](#)) and (2) test the moderated mediating effect of perceived green value ([H3](#)). This study employed a 2 (food type: hedonic or utilitarian) $\times$ 2 (pricing strategy: partitioned or combined price) factorial experimental design to test the two-way interaction between food type and pricing strategy.

4.1 Method

4.1.1 Stimuli and experimental procedure. Study 2 utilized an online survey to collect data. The same research procedures as in Study 1 were applied; however, different experimental stimuli were used. Four messages were developed to present both hedonic and utilitarian food products with edible packaging, utilizing either partitioned or combined pricing ([Appendix C](#)). The manipulation of food type remained consistent with Study 1. To manipulate the pricing

Table 1. Respondent profiles

Category	Study 1		Study 2	
	N	%	N	%
<i>Age</i>				
18–20 years	3	2.54%	6	2.50%
21–30 years	28	23.73%	75	31.25%
31–40 years	29	24.58%	62	25.83%
41–50 years	26	22.03%	46	19.17%
51–60 years	21	17.80%	31	12.92%
61–70 years	9	7.63%	15	6.25%
71 years and older	2	1.69%	5	2.08%
<i>Gender</i>				
Male	51	43.22%	91	37.76%
Female	66	55.93%	142	58.92%
Other	1	0.85%	8	3.32%
<i>Race</i>				
Caucasian	92	77.97%	161	66.80%
Black/of African descent	14	11.86%	30	12.45%
American Indian or Alaska Native	1	0.85%	0	0.00%
Asian/of Asian descent	5	4.24%	26	10.79%
Mixed race	5	4.24%	16	6.64%
Native Hawaiian or Other Pacific Islander	0	0.00%	8	3.32%
Other	1	0.85%	0	0.00%
<i>Education</i>				
Some high schools or less	0	0.00%	1	0.41%
High school diploma or GED	18	15.25%	31	12.86%
Some college, but no degree	32	27.12%	51	21.16%
Associate or technical degree	14	11.86%	25	10.37%
Bachelor’s degree	43	36.44%	93	38.59%
Graduate or professional degree	11	9.32%	40	16.60%
<i>Annual household income</i>				
Less than \$25,000	20	16.95%	40	16.60%
\$25,000–\$49,999	35	29.66%	50	20.75%
\$50,000–\$74,999	21	17.80%	56	23.24%
\$75,000–\$99,999	17	14.41%	37	15.35%
\$100,000–\$149,999	13	11.02%	32	13.28%
\$150,000 or more	9	7.63%	19	7.88%
Prefer not to say	3	2.54%	7	2.90%
<i>Employment</i>				
Work full-time	57	48.31%	119	49.38%
Retired	10	8.47%	13	5.39%
Work part-time	21	17.80%	32	13.28%
Own business	6	5.08%	17	7.05%
Unemployed	14	11.86%	37	15.35%
Full-time student	4	3.39%	9	3.73%
Other (please list)	4	3.39%	11	4.56%
Prefer not to say	2	1.69%	3	1.24%
Source(s): Authors’ own work				

strategy, the combined price represented the total cost of the food product and its edible packaging, while in the partitioned price condition, the prices for the food product and edible packaging were listed separately. Data collection was conducted through an online survey, following the same survey process as in Study 1.

Table 2. Results of one-way ANCOVA (Study 1)

Source	Type III sum of squares	df	Mean square	F	p
<i>DV is purchase intention</i>					
Corrected model	25.32	3.00	8.44	2.50	0.06
Intercept	128.56	1.00	128.56	38.12	<0.001
Past experience	2.51	1.00	2.51	0.74	0.39
Gender	3.84	1.00	3.84	1.14	0.29
Food type	20.18	1.00	20.18	5.98	0.02
Error	384.46	114.00	3.37		
Total	2631.33	118.00			
Corrected total	409.77	117.00			

Source(s): Authors' own work

4.1.2 Measurement. The identical questions used for manipulation checks, realism checks, dependent variables, and control variables were replicated (see [Appendix B](#)). In particular, purchase intention was measured by using three items ($\alpha = 0.97$); perceived green value was measured by three items ($\alpha = 0.89$).

4.1.3 Sampling and data analysis. The survey was again restricted to individuals who were aged 18 or older, residing in the United States, and who had food shopping experiences in the past six months. Data collection was conducted via Prolific as well. The total sample size was 241 ($N_{\text{ChocolateBrownie} + \text{Partitioned}} = 60$; $N_{\text{ChocolateBrownie} + \text{Combined}} = 61$; $N_{\text{WholeGrainGranola} + \text{Partitioned}} = 64$; $N_{\text{WholeGrainGranola} + \text{Combined}} = 56$). Among the participants, 31.25% were aged between 21 and 30 years old; 58.92% were females; 66.80% were Caucasian; almost half of them had bachelor's degrees or above; 23.24% earned \$50,000-\$74,999; and 49.38% had full-time jobs ([Table 1](#)). Two-way ANCOVA was used to examine the interaction effect between food type and pricing strategy on purchase intention ([H2](#)). PROCESS model 8 was used to test the moderating effect of pricing strategy on the mediation effect of perceived green value between food type and purchase intention ([H3](#)).

4.2 Results

4.2.1 Manipulation and realism checks. The results from the one-way ANOVA revealed that participants in the hedonic condition perceived the chocolate brownie as a more hedonic food ($M_{\text{ChocolateBrownie}} = 5.39$, $SD = 1.24$) compared to those in the utilitarian condition who rated the whole grain granola lower on the hedonic scale ($M_{\text{WholeGrainGranola}} = 4.17$, $SD = 1.33$; $F = 54.08$, $p < 0.001$). Conversely, participants in the utilitarian condition tended to see the whole grain granola as a more utilitarian food ($M_{\text{WholeGrainGranola}} = 5.08$, $SD = 1.04$) compared to those in the hedonic condition who rated the chocolate brownie lower on the utilitarian scale ($M_{\text{ChocolateBrownie}} = 3.05$, $SD = 1.10$; $F = 217.81$, $p < 0.001$). The average score for realism checks items was 5.19 ($SD = 1.35$).

4.2.2 Two-way ANCOVA (H2). A two-way ANCOVA was used to explore how the interaction between food type and pricing strategies influenced participants' purchase intention. Similar to Study 1, participants' past experience with edible food packages and gender were considered as covariates. The results (as shown in [Table 3](#)) confirmed the main effect of food type on purchase intention ($F = 4.83$, $p = 0.03$). In particular, participants who encountered the hedonic condition ($M_{\text{ChocolateBrownie}} = 4.35$, $SE = 0.16$) expressed greater purchase intentions compared to those in the utilitarian condition ($M_{\text{WholeGrainGranola}} = 3.84$, $SE = 0.16$).

Further, the interaction between food types and pricing strategies on purchase intention was also statistically significant ($F = 6.01$, $p = 0.02$). Specifically, within the utilitarian food

Table 3. Results of two-way ANCOVA (Study 2)

Source	Type III sum of squares	df	Mean square	F	p
<i>DV is purchase intention</i>					
Corrected model	49.96	5.00	9.99	2.78	0.02
Intercept	262.34	1.00	262.34	72.90	<0.001
Past experience	10.76	1.00	10.76	2.99	0.09
Gender	5.12	1.00	5.12	1.42	0.23
Food type	7.74	1.00	7.74	2.15	0.14
Price	7.45	1.00	7.45	2.07	0.15
Food type × Pricing strategy	21.64	1.00	21.64	6.01	0.01
Error	845.68	235.00	3.60		
Total	4962.44	241.00			
Corrected total	895.64	240.00			

Source(s): Authors' own work

condition, participants who received the partitioned price strategy ($M_{\text{WholeGrainGranola} + \text{Partitioned}} = 4.39, SE = 0.24$) reported higher purchase intention than those receiving the combined price strategy ($M_{\text{WholeGrainGranola} + \text{Combined}} = 3.43, SE = 0.25; F = 7.45, p < 0.01$). For the hedonic condition, there was no significant difference in purchase intention between partitioned price ($M_{\text{ChocolateBrownie} + \text{Partitioned}} = 4.15, SE = 0.25$) and combined price strategies ($M_{\text{ChocolateBrownie} + \text{Combined}} = 4.39, SE = 0.24; F = 0.55, p = 0.48$). Please see Figure 2 for relationship patterns. Therefore, Hypothesis 2 was supported.

4.2.3 Moderated mediation. To test the moderated mediation effect, a bootstrapping technique (using PROCESS model 8; Hayes, 2017) was applied. Participants' past experience with edible food package and gender were utilized as covariates. The findings revealed a significant mediation effect of perceived green value between food type and pricing strategy (index = 0.49, $SE = 0.20$, 95% CI = [0.12, 0.91]). In particular, the mediating effect of perceived green value between food type and pricing strategy on purchase intention was statistically significant (index = 0.93, $SE = 0.38$, 95% CI = [0.20, 1.70]). Therefore, the results provided support for Hypothesis 3.

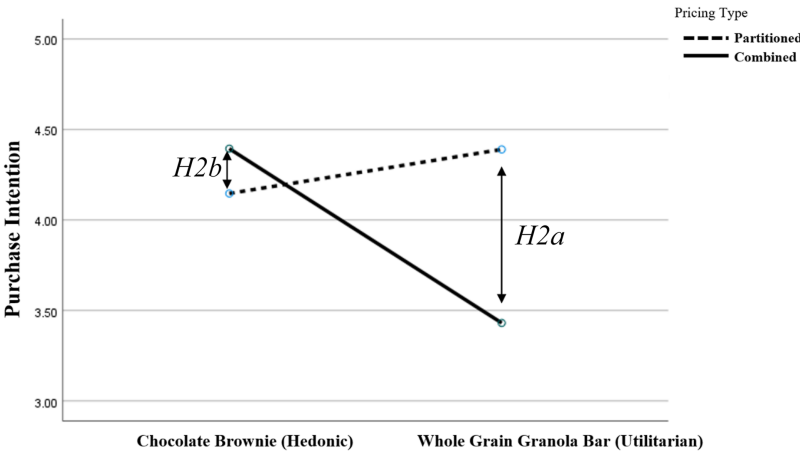


Figure 2. Two-way interaction between food types and pricing strategies. Source: Authors' own work

5. General discussion

This study explored the potential of edible food packaging as a sustainable alternative to traditional packaging materials, addressing the environmental impact of packaging waste, particularly in the food and beverage industries. The findings from two consecutive studies provide insights into consumers' perceptions and intentions regarding edible food packaging and the influence of pricing strategies on these perceptions.

Study 1 revealed that consumers had higher purchase intentions for food products with edible packaging when presented with hedonic options compared to utilitarian ones. This highlights the importance of emotional appeal in promoting sustainable packaging solutions, aligning with [Lombardi et al.'s \(2023\)](#) study that suggested that marketing strategies should leverage emotional responses when promoting sustainable products. Perceived green value was identified as a mediator between food type and purchase intention. This finding shows that consumers' perception of environmental benefits influenced their intention to purchase. Specifically, hedonic food choices positively impacted purchase intentions by allowing consumers to justify their purchase through perceived environmental benefits while deriving emotional value from it.

Building on Study 1, Study 2 confirmed the main effect of food type on purchase intentions, with hedonic options eliciting higher intentions than utilitarian ones. It also found a significant interaction between food type and pricing strategies, where partitioned pricing, where the cost of the food product and packaging was listed separately, led to higher purchase intentions for utilitarian options compared to combined pricing. This finding supports [Liu and Chou's \(2020\)](#) study that transparent pricing enhances perceived value for utilitarian products. The moderated mediation analysis further revealed that the relationship between food type and purchase intention was moderated by pricing strategy. For utilitarian products, partitioned pricing not only increased transparency but also emphasized the sustainable value by highlighting the cost allocation of the product's components.

These findings are consistent with recent research highlighting the importance of emotional appeal in sustainable product marketing. For example, [Weisstein et al. \(2023\)](#) demonstrated that hedonic food products paired with environmental claims elicited stronger consumer evaluations compared to utilitarian products, aligning with our finding that hedonic foods with edible packaging generated higher purchase intentions. Similarly, [Lombardi et al. \(2023\)](#) found that eco-packaging in organic foods triggered emotional influences in consumer choices, supporting our conclusion that sustainability attributes can serve as justifications for hedonic consumption. Our results on pricing strategy also align with [Liu and Chou \(2020\)](#), who showed that transparent payment formats can increase perceived value for utilitarian products, and with [Repetti et al. \(2015\)](#), who found that consumers preferred simpler, partitioned resort fee pricing. Together, these studies reinforce the importance of tailoring pricing strategies to product type. Finally, the mediating role of perceived green value echoes findings in [Chen and Chang \(2012\)](#), who reported that green perceived value enhances purchase intention for sustainable products, and in [Peloza et al. \(2013\)](#), who demonstrated that pro-ethical consumption reduces guilt associated with hedonic purchases. Our study extends these insights by showing how green value interacts with both product type and pricing format in the edible packaging context.

In conclusion, this study examined the viability of edible food packaging as a sustainable alternative. Results indicated that consumers showed a greater evaluation of hedonic food options over utilitarian ones when presented with edible packaging. This result emphasizes the importance of emotional appeal in sustainable product marketing. Additionally, partitioned pricing enhanced purchase intentions for utilitarian products by highlighting cost transparency. Consumers' perceived green value contributes to understanding their behavior toward sustainable packaging and pricing strategies in the foodservice industry.

6. Conclusion

Edible food packages, as an alternative to traditional food packages, offer a great opportunity to reduce solid waste and thus have the potential to move the foodservice industry to the next

sustainable era. However, consumers' perceptions of the value and the added costs associated with edible food packaging have hindered its widespread adoption in the foodservice industry. By conducting two experimental design studies, this study successfully uncovered the mechanisms that influence consumers' purchasing decisions for foods with edible packages. Theoretical and practical implications are discussed below.

6.1 Theoretical implications

This study has contributed to the literature and theory application in various ways. First, the successful application of the dual process theory has broadened its application in the realm of edible food packaging, though previous studies have tested its utilization in tourism and related fields (Kwon *et al.*, 2021; Stylos, 2022). This provides directions for future studies in innovative and sustainable products to utilize this theory in understanding consumers' choices. Besides, it offers a deeper comprehension of consumers' behaviors through both rational and emotional pathways. These cognitive pathways, as the underlying mechanism in the dual process theory, offer researchers the opportunities to test and examine potential mediators impacting consumers' decision-making process.

Second, by examining the main effects of food types, this study adds to our understanding of the differences in consumer behaviors when purchasing hedonic and utilitarian foods. By examining the mediating effects of perceived green value, the study findings further proved that the pro-environmental characteristics associated with edible food packages played the same role as pro-ethical consumption (Peloza *et al.*, 2013) to offset the guilty feeling of consumers when purchasing hedonic-driven food products such as chocolate brownies. This finding has contributed to the framework of hedonic and utilitarian consumption paradigms by uncovering the important role of hedonism in improving consumers' evaluations of eco-friendly products or innovative food. On the other way, it further demonstrated how emotional and rational pathways work together in the dual process theory in the context of hedonic product purchases.

Third, the interaction effects between types of foods and pricing strategies confirm the optimal condition in which the effectiveness of utilitarianism will be maximized by adopting the partitioned pricing strategy in the context of eco-friendly product promotion. This finding added to our understanding of how consumers' rational pathway functions when making purchasing decisions on foods with utilitarian characteristics. This finding also expanded the current literature by showcasing how consumers' value propositions can be strengthened through the rational pathway in the dual process theory.

Finally, the mechanism behind the interactional effect between food type and pricing strategy on consumers' purchase intentions was identified by testing the moderated mediating role of the green perceived value. This finding enhanced our understanding of how the perceived green value rationally strengthens consumers' willingness to pay for the add-on costs of edible food packaging. Theoretically, it expanded the current literature on consumers' sustainable food consumption behaviors in the foodservice industry. Future studies in other contexts exploring consumer behavior and decision pathways may benefit from incorporating perceived green value as a moderated mediator.

6.2 Practical implications

The results identified in the current study have yielded a plethora of recommendations pertinent to the foodservice and hospitality industry. First, during the initial phases of developing and promoting edible food packaging, foodservice operators should start by applying edible packages to hedonic food types. As evidenced by the findings from this study, consumers have a higher inclination to pay for edible food packages along with foods with indulgent and sensory-rich food characteristics. Implementing the above-mentioned strategy may have the potential to attract consumers and thereby maximize the efficiency of the early promotion of edible food packages among consumers. Additionally, considering the emotional

path under the dual process theory in which consumers proceed to decision-making, foodservice operators should incorporate an emotional appeal in the marketing and presentation of food products, particularly when introducing sustainable food options.

Rooted in the empirical evidence presented, when promoting utilitarian food types, marketing practitioners in the foodservice and hospitality industry should adopt a partitioned pricing strategy instead of a combined pricing strategy. Foodservice business operators seeking to increase consumers' purchase intentions for utilitarian foods may benefit from adopting the partitioned pricing strategy as it elevates the transparency of the cost allocations while at the same time highlighting the sustainable values of the food products.

Considering the roles played by the perceived green value in the current study, foodservice and hospitality practitioners are recommended to effectively communicate the environmental advantages and sustainable characteristics of foods with edible packages. Besides, educational materials could be developed for consumers through different channels. For example, communicating the environmental advantages of edible food packing through digital platforms such as social media sites or company websites, or displaying a graphic note with information about edible food packaging on the food shelf or the dining table. Educating the staff members bears similar importance as they will be the ambassadors who advocate such messages and information to customers. Increasing consumers' awareness and knowledge of the ecological advantages of edible food packaging may help generate a higher perceived green value, thus increasing their intention to purchase such food products.

Moving toward the next phase of sustainability initiatives, edible food packaging is very promising with wide implications considering its value and consumers' willingness to pay for it. Hospitality operators are recommended to work with suppliers specialized in sustainable food packaging to ensure its seamless integration in the next decade. Besides food retailing places and restaurants, hospitality business operators should also consider adding foods with edible food packages in min bars in hotel rooms. Such implementation not only with the growing trend of sustainability but also the hotel's Corporate Social Responsibility initiatives.

6.3 Limitations and future studies

The current study is not exempt from limitations. First, the current study was conducted in the U.S. so the results may not be generalizable to consumers in other countries. Consumers who come from different cultural backgrounds may react differently toward edible food packages. Future studies are encouraged to expand the data collection to a broader context and further compare the cross-cultural differences. Second, due to time and resource constraints, the studies in this study were conducted in artificial experiment settings. The artificial environment may not fully capture the complexities of the real business environment. Consumers may react differently in a real shopping environment when they're spending their own money. Future studies may conduct this experiment in a real business context and collect second-hand sales data to verify the findings reported in this study. Lastly, due to the nature of experimental design studies, limited external variables were included in this study. Future studies may use other types of methodologies to identify how other possible factors such as individual characteristics, prior experience of consuming edible food packages, and income status influence consumers' purchase intentions.

Supplementary material

The supplementary material for this article can be found online.

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