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Bridging the Gap: Determinants of Consumers' Willingness to Pay for Environmentally Friendly Packages of Leafy Greens

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Abstract: Government and corporate policies have mandated a reduction in plastic packaging to combat issues of waste and climate change. This move towards sustainable packaging alternatives in the fresh food sector will increase costs for consumers. Much of the present research finds consumers are willing to pay more for sustainability, but their willingness to pay (WTP) does not align with real-world purchases, representing an attitude–behaviour gap. To combat this gap, it is posited that consumers' current purchasing- and sustainability-related behaviours will meaningfully correlate with their WTP and bridge the attitude–behaviour gap. This research used an online survey (n = 476) to gauge consumers' attitudes and behaviours regarding sustainability as it relates to packaging, biofortification, and WTP in the fresh leafy greens sector. Using binary logistic regression, this research finds that price- and sustainability-related purchasing habits and attitudes towards sustainable packaging meaningfully narrow the attitude–behaviour gap, but organic purchasing habits, waste segregation habits, and sustainability literacy do not. This research contributes the knowledge that, for environmentally friendly leafy greens, past price- and sustainability-related purchasing behaviour should be used instead of merely attitudes as an indication of WTP.

Keywords: leafy greens; sustainable packaging; attitude–behaviour gap; current purchasing habits; willingness to pay



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1. Introduction

In 2020, 27% of all packaging waste in Ireland was plastic (306,000 tonnes), and only 29% of this was recycled [1]. Limited data on plastic food packaging waste is available in the EU and Ireland, so it is unknown how much is generated and how it is treated. However, some sources estimate that between 40% and 50% of all plastic packaging is used for food packaging [2,3].

The most popular types of food packaging in Ireland are single-use and are often difficult to recycle [4]. These packages are most commonly made of polyethylene, polystyrene, polypropylene, or polyvinyl chloride [5]. To pivot towards sustainability in packaging, referred to as any food packaging that is recycled, recyclable, biodegradable, or made from bio-based materials [6,7], EU-, national-, and corporate-level policies aim to move away from plastic packaging primarily due to the negative environmental effects of plastic production and waste (e.g., [8–11]).

However, the switch to sustainable packaging in the fresh food sector is not straightforward. Growers and retailers are wary of the ability of sustainable packaging “to protect [their products] or endure various conditions” [4] (p. 27). The reliability of traditional plastic packaging has been proven, and a switch away from this could mean a loss of product, time, and money if the substitute is poor.

The strongest barrier to advancing sustainable actions in the fresh leafy greens market is cost [4]. Upfront costs to switch to sustainable growing techniques and sustainable

packaging materials—e.g., through direct materials costs and investments in packaging machinery and growing technologies—are mainly shouldered by growers, resulting in increased downstream costs for consumers [4,8,12,13]. Upstream changes in food packaging will inevitably affect how consumers shop and how they generate food waste at home, making it critical to explore.

This paper is structured as follows. The remainder of this chapter focuses on the theoretical background and supporting literature review, which together form the basis for identifying the research question. The following chapter focuses on the methods, survey design, and six hypotheses that this research has implemented and will address. The results are then laid out for each hypothesis and the interactions between each of the six variables tested, followed by a chapter to discuss the results in the context of the literature. Finally, the conclusion chapter lays out the research's implications and its shortcomings, as well as potential future research ideas and considerations.

1.1. Theoretical Background

In the context of this research, 'environmentally friendly' consists of sustainable packaging and leafy greens grown in a manner that will reduce food waste. Despite environmentally friendly produce taking up only a small market share presently, retailers will be forced to expand their offerings in the coming years to abide by the aforementioned EU and national regulations. As more expensive, sustainable options trickle into shops, it is important to understand what factors can contribute to consumers' shift to sustainable purchases.

Theories like the Theory of Planned Behaviour [14] postulate that attitudes are important predictors of behaviours. This research takes it as a given that pro-environmental attitudes lend themselves to a willingness to pay more for environmentally friendly products [15–17]. Research has been conducted to gauge consumers' willingness to pay (WTP) for sustainable food products and has shown that WTP is highest for fruit and vegetable products [18].

Research has also shown that consumers often do indicate a WTP for sustainable packaging when they can identify and trust that it is sustainable [19]. However, this WTP is mostly tested via surveys and not in practice [19,20].

Many studies on the WTP for environmentally friendly products are hindered by the attitude–behaviour gap and factors like social desirability biases [21,22]. That is, these studies predict a higher WTP than is evident in real world purchases, as shown by the small market share taken up by eco-friendly products [17,23]. For example, despite positive attitudes towards organic and sustainable food, organic vegetables accounted for only 6% of the 2020 Irish vegetable market [24].

To bridge the attitude–behaviour gap that is often found in sustainability research regarding WTP, this research follows the work of Aarts et al. [25] that habit is a strong force and that not all choices are made consciously. Additionally, Zepeda and Deal [26] found that, among organic consumers, habit was a strong bridge between behaviour and attitudes. Purchasing history is a generally well-accepted predictor of future purchases. In this research, we use habitual purchasing history as a mediator between attitudes and behaviours, i.e., purchases.

1.2. Literature Review

As stated above, the transition to sustainable packaging and sustainable growing techniques to produce environmentally friendly leafy greens will result in increased costs for consumers. However, higher prices can be a deterrent for consumers buying more environmentally friendly leafy greens [27,28]. For example, consumers in Ireland claim they are willing to pay more for products in sustainable packaging while simultaneously showing a preference for any less expensive alternative [4]. Rokka and Uusitalo [29] also found that price and packaging were nearly equal in terms of consumers' ranking of importance (35% and 34%, respectively).

It is important, therefore, to determine if there are existing factors that indicate a meaningful WTP for environmentally friendly leafy greens beyond pro-environmental attitudes.

As noted above, consumers often indicate a WTP for sustainable food and sustainable packaging, but this is not matched by actual purchasing practices. Many factors have been found to influence a consumer's WTP for a sustainable alternative, including their pro-environmental attitudes towards plastic packaging, adequate sustainability literacy, and behaviours surrounding sustainability, including waste segregation and current purchasing habits.

1.2.1. Attitudes towards Sustainable Packaging

Household food waste generation is first and foremost controlled by consumers themselves. The reasons for generating food waste at home are complex, but one of the most prevalent reasons is spoilage [30,31]. It is a well-accepted concept that packaging extends the shelf life of fresh foods, thereby slowing spoilage and reducing food waste [32–34]. The negative costs of packaging often far outweigh the negative costs of the food waste that would result without the packaging. Despite this, consumers are generally more mindful of the packaging they dispose of than the food they waste, even if they are otherwise environmentally conscious consumers [34–36].

Consumers have, in a variety of research, shown a positive WTP for food in sustainable packaging, whether it be recyclable, bioplastics, or even packaging-free [19,20,29]. However, other studies have shown that sustainable packaging is not a meaningful purchase criterion [20]. Despite this heterogeneity in research findings, there will be a commercial transition to sustainable packaging per EU and national regulations and it is important to understand consumers' WTP for sustainable packaging in Ireland.

1.2.2. Secondary Actions towards Packaging

Positive pro-environmental attitudes can influence actions but may require education and resources to develop. Conversely, just having environmental knowledge does not directly affect pro-environmental behaviour [37]. In order to perform sustainable actions, however, it could be argued that consumers must have some environmental knowledge. Being able to identify sustainable packaging from non-sustainable packaging, for example, represents the knowledge and skills needed to make an informed, sustainable purchase. This ability fits the idea of sustainability literacy, as put forward by the UN [38]. Popovic et al. [23] found that ecoliteracy, a similar idea, can be used as a predictor of consumers' positive attitudes towards environmentally friendly packaging.

In order to increase sustainability literacy with regard to sustainable packaging, it must be clearly marked and provide consumers with trustworthy information to combat scepticism brought on by greenwashing [19,39–41]. It has been well established in 'green' research that sceptical consumers are unwilling to pay for claims they do not understand or believe [19,42]. There is little research on greenwashing scepticism in Ireland. However, understanding Irish consumers' sustainability literacy in terms of packaging may be important for predicting consumer uptake of sustainable packaging and should therefore be further explored.

Sustainability literacy can also be demonstrated when disposing of food and packaging waste. For sustainable packaging to be truly sustainable, it needs to be handled properly at its time of disposal. For example, recyclable plastic materials should be cleaned and sent to recycling streams instead of general waste. Contamination of waste streams presents a significant barrier to adequate material recovery and sustainable practices [4,43].

Popovic et al. [23] found that consumers who already segregate their waste are less willing to spend more on sustainable packaging. The availability of soft plastic recycling in Ireland might cause a similar outcome, but the topic must be explored further.

1.2.3. Sustainable Purchasing Habits

Global sales of organic food and drink neared EUR 135 billion in 2022 [44]. The market for organic vegetables in Ireland was valued at EUR 54.7 million in 2020, representing a year-on-year growth of 17.9% and accounting for 6% of the vegetable market [24]. Many consumers already trust organic produce and choose to purchase it for their own sustainability values, among other reasons [12,26]. Consumers with higher levels of environmental knowledge have been shown to opt for organic produce [45,46].

Organic options are more expensive than conventionally produced options. Even without the organic label, many consumers take price as an indication of quality and opt for more expensive options [47]. In this instance, opting for the more expensive option is often habitual. Habit has been shown to be an important part of why some consumers opt—or do not opt—to buy organic foods [26,48].

Beyond organics, there is a literature gap surrounding purchasing habits of sustainable food products. There is research regarding consumers' switch to environmentally friendly dietary habits, such as the switch to vegetarianism or veganism, but little that is directly related to their purchases between sustainable substitutes, e.g., sustainably packaged versus traditionally packaged.

Relevant research on willingness to pay for sustainable food has been mostly generalised to broad food categories such as fruits and vegetables. Fruits and vegetables are consistently the highest-wasted food products by weight in studies about food waste [30,49]. Leafy greens can have an especially high rate of waste in households [50,51], but there is little research to understand how consumers would react to environmentally friendly leafy greens specifically. Additionally, there is substantial heterogeneity between studies measuring willingness to pay depending on the location, food product, and classification of 'sustainable', i.e., organic, fair trade, local, or environmentally friendly [18]. Therefore, other studies' results may not perfectly translate to the Irish market for fresh leafy greens, presenting a literature gap that must be filled.

1.2.4. Attitude–Behaviour Gap

The road to reducing household plastic packaging waste and food waste is not a straight line for consumers and involves trade-offs and internal conflicts. While positive pro-environmental attitudes are positive indicators of a transition to sustainable consumption, a significant gap exists between attitudes and real purchasing behaviours [16,31,52–54]. Consumers who indicate they would be willing to pay more for sustainable products may, in reality, be unwilling to pay when a comparable item is less expensive [4,27]. Consumers often would like to purchase sustainable foods but are unable to do so because of issues like price and availability [4,28].

The attitude–behaviour gap is a well-established concept, but it is not consistently recognised in sustainability-related research. In a 2020 systematic review of 46 studies investigating intention to buy, willingness to buy, or willingness to pay for environmentally friendly packaging, Ketelsen et al. [20] found only 6 studies discussed their results with an acknowledgement of the attitude–behaviour gap. Therefore, the limited research on the attitude–behaviour gap in relation to sustainable packaging in food presents a literature gap to be filled.

1.3. Research Question

From the above, we can identify multiple literature gaps as they relate to the Irish market and consumer: the importance of sustainable packaging; sustainability literacy as it relates to packaging; self-reported waste segregation habits of leafy greens and their packaging; self-reported sustainable purchasing habits (including organics, price, and overall sustainability); and willingness to pay for sustainable leafy greens. This research therefore looks to build on this new information and bridge two overarching gaps: the literature gap regarding willingness to pay for environmentally friendly fresh leafy greens

and the attitude–behaviour gap that exists between sustainability research and actual purchasing choices.

It is evident that a consumer’s choice to opt for sustainably grown and sustainably packaged fresh foods is complicated. This research asks: how effectively can attitudes and behaviours related to sustainability and current purchasing habits meaningfully bridge the attitude–behaviour gap related to consumers’ willingness to pay more for environmentally friendly leafy greens?

This research draws on and adds to the knowledge base created by other consumer research of sustainable food and sustainable packaging, including Popovic et al. [23] and Robinson and Smith [28].

2. Materials and Methods

2.1. Methods

The target audience for this survey was adults living in the Republic of Ireland and Northern Ireland who regularly purchase leafy greens. To qualify for the survey, respondents had to be at least 18 years old and responsible for regularly buying leafy greens for themselves or their households.

Data for this research was gathered through an online survey, and respondents were recruited using snowball sampling. The survey was promoted through Leaf No Waste’s direct social media channels (LinkedIn, Twitter, and Facebook) and through cold emails to community groups, charities, businesses and sporting groups, among others. Additionally, paper flyers with QR codes directing to the survey were posted on community noticeboards throughout Leinster.

There were no financial incentives for respondents to complete the survey. Only completed surveys were received and qualified for analysis. The survey was open for responses between September 2022 and March 2023. Overall, 559 responses were submitted, of which 476 were eligible for analyses.

2.2. Survey Design

After consent, eligibility, and demographic questions, the survey was divided into three sections with the following topics covered: attitudes towards the packaging of leafy greens (8 questions), attitudes towards biofortified plant production (5 questions), and willingness to pay for a more sustainable leafy green product (5 questions).

Six variables across three categories relating to consumer attitudes and behaviours were analysed for significant relationships with their willingness to pay more for an environmentally friendly package of leafy greens:

1. Attitude towards the importance of sustainable packaging of fresh leafy greens.
2. Secondary actions related to sustainable packaging:
 - a. Waste segregation practices related to fresh leafy greens and packaging; and
 - b. Sustainability literacy regarding plastic packaging of fresh leafy greens.
3. Current purchasing habits:
 - a. Current organic purchasing habits related to fresh leafy greens;
 - b. Current price- and sustainability-related purchasing habits related to fresh leafy greens; and
 - c. Current overall eco-friendly purchasing habits related to fresh leafy greens.

2.3. Hypotheses

This research tests the relationships between WTP for sustainable leafy greens with variables from categories (1) and (2) above. The following hypotheses were proposed:

H1. *Consumers’ ranking of the importance of sustainable packaging of leafy greens is positively correlated with WTP for environmentally friendly leafy greens.*

H2a. *Consumers' waste segregation habits are negatively correlated with WTP for environmentally friendly leafy greens.*

H2b. *Consumers' sustainability literacy is positively correlated with WTP for environmentally friendly leafy greens.*

Considering leafy greens generally make up only a small portion of a consumers' shopping basket, the sustainability of a small product might not be viewed as vital and even consumers with strong attitudes towards sustainability may not make the change. Additionally, given the present economic setting, including rising food prices (there was an 11.7% increase in food and non-alcoholic beverage prices in Ireland between December 2021 and December 2022 [55]), this research posits that factors unrelated to purchase history will alone not explain why a consumer would demonstrate a WTP for environmentally sustainable leafy greens.

This research posits that the question of WTP for an environmentally friendly leafy green is strongly associated with self-reported current purchasing habits. Therefore, the following hypotheses related to current purchasing habits of leafy greens based on variable category (3) were proposed:

H3a. *The frequency with which consumers opt for organic fresh leafy greens is positively correlated with WTP for environmentally friendly leafy greens.*

H3b. *Price- and sustainability-related current purchasing habits are positively correlated with WTP for environmentally friendly leafy greens.*

H3c. *Consumers' belief that they always purchase environmentally friendly leafy greens when available is positively correlated with WTP for environmentally friendly leafy greens.*

It is hypothesized that the habits of opting for organic fresh leafy greens over conventionally grown fresh leafy greens; choosing a more expensive, sustainable option; and always opting for sustainable options are habits that will be meaningfully correlated with consumers' WTP for environmentally friendly fresh leafy greens. When respondents indicate their current purchasing habits involve more organic/expensive/sustainable options, it follows that the choice to repurchase the same or an equivalent (sustainable) product cannot be fully accounted for by attitudes because habits have a strong influence on the perceived choice. These habits will bridge the attitude-behaviour gap found in research on similar topics.

3. Results

Overall, 76.9% of the 476 eligible survey respondents identified as female (n = 366), 21.4% identified as male (n = 102), and 1.7% identified as non-binary, transgender, or did not disclose their gender (n = 8). Most respondents were aged 36 years or older, with 40.3% of respondents between the ages of 36 and 50 (inclusive) (n = 192) and 33.4% aged 51 or over (n = 159). Moreover, 19.3% of respondents were aged between 26 and 35 years old (n = 92), and 6.9% were aged between 18 and 25 years old (n = 33). In addition, 98.1% of respondents lived and did their shopping in the Republic of Ireland (n = 467), with the additional 1.9% doing their shopping outside of the Republic (i.e., in Northern Ireland) (n = 9). In total, 70.6% of respondents lived in the province of Leinster (n = 336), followed by the provinces of Connacht (13.7%, n = 65) and Munster (12.0%, n = 57), and finally the province of Ulster (3.8%, n = 18). Overall, 71.6% of respondents lived in a city or town (n = 341), and 28.4% lived in the countryside or a village (n = 28.4%). Moreover, 81.5% of respondents were employed (n = 388), of which 10.6% were also students (n = 41). Other respondents were categorised as retirees (n = 37), students not in employment (n = 35), full-time unpaid carers (n = 8), and unemployed (n = 8). The annual household income of 37.0% of respondents was between EUR 33,000 and EUR 72,999 (n = 176). Additionally, 21.6% had an annual household income below EUR 33,000, 20.2% had an annual household income between

EUR 73,000 and EUR 100,999 ($n = 96$), and 21.2% had an annual household income greater than or equal to 101,000 ($n = 101$). Most respondents had achieved a third-level qualification (92.2%, $n = 469$). Overall, 6.5% of respondents had completed a Leaving Cert (secondary school) ($n = 31$), and the remaining 1.3% had completed a Junior Cert (junior secondary) or had no formal qualifications ($n = 6$). Approximately one-third of respondents lived in households with two adults and zero children ($n = 155$). Meanwhile, 60.3% of households had zero children ($n = 287$), 13.0% had one child (62), 18.5% had two children ($n = 88$), and 8.2% had three or more children in the household ($n = 39$). In total, 16.0% of respondents lived in a household with one adult ($n = 76$), 60.1% had two adults ($n = 286$), 16.0% had three adults ($n = 76$), and 8.0% had four or more adults in the household ($n = 38$).

To gauge WTP, respondents were asked how much extra they would be willing to pay for an environmentally friendly package of leafy greens if the product costs EUR 2.00. They were grouped into two categories for analyses: those willing to pay more than EUR 2.00 for environmentally friendly leafy greens and those unwilling to pay more than EUR 2.00 for environmentally friendly leafy greens. Overall, 89.50% of survey respondents indicated a willingness to pay more than EUR 2.00 (Table 1). The proportion of respondents who indicated they would be willing to pay more here is higher than other studies on similar subjects (e.g., Popovic et al. [23]). This high proportion of respondents with a WTP for sustainability emphasises the need to bridge the attitude–behaviour gap to better understand realistic consumer demand.

Table 1. Frequency of consumers’ willingness to pay more for an environmentally friendly package of leafy greens.

Willingness to Pay More for an Environmentally Friendly Package of Leafy Greens	Frequency (n)	Percent (%)
Not willing to pay more	50	10.50%
Willing to pay more	426	89.50%
5–25% more (EUR 0.10–EUR 0.50)	295	69.25%
25–50% more (EUR 0.50–EUR 1.00)	116	27.23%
50–75% more (EUR 1.00–EUR 1.50)	15	3.52%
Total	476	100.00%

Results of the relationships between consumers’ WTP and factors interacting with their WTP in this research are presented in Table 2.

Table 2. Relationships between consumers’ willingness to pay more for environmentally friendly leafy greens and all other research variables.

Variable		Not Willing to Pay More		Willing to Pay More	
		n	%	n	%
From 1 to 5, how important is sustainable packaging of fresh leafy greens to you?	1	5	62.50%	3	37.50%
	2	2	10.53%	17	89.47%
	3	8	14.81%	46	85.19%
	4	13	9.85%	119	90.15%
	5	22	8.37%	241	91.63%
Frequency of Separating Spoiled Leafy Greens from Packaging when Discarding Both	Never	5	15.63%	27	84.38%
	Sometimes	10	9.43%	96	90.57%
	Always	35	10.36%	303	89.64%
I find it difficult to distinguish between ecofriendly and non-ecofriendly packaging of leafy greens	Strongly Disagree	3	15.79%	16	84.21%
	Disagree	6	13.95%	37	86.05%
	Neither Agree nor Disagree	2	4.88%	39	95.12%
	Agree	17	9.77%	157	90.23%
	Strongly Agree	22	11.06%	177	88.94%

Table 2. Cont.

Variable		Not Willing to Pay More		Willing to Pay More	
		n	%	n	%
How Frequently Respondents opt to Buy Organic Fresh Leafy Greens over Conventionally Produced Leafy Greens	Never	10	20.00%	40	80.00%
	Sometimes	32	9.28%	313	90.72%
	Always	8	9.88%	73	90.12%
Current Purchasing Habits	Conventionally Produced—EUR 1.58	29	27.62%	76	72.38%
	Not sure	10	11.76%	75	88.24%
	Sustainably Produced—EUR 2.00	11	3.85%	275	96.15%
When I have a choice between 2 equal leafy greens, I always choose the one that is less harmful for the env.	Disagree/Strongly Disagree	6	20.00%	24	80.00%
	Neither Agree nor Disagree	16	16.49%	81	83.51%
	Agree/Strongly Agree	28	8.02%	321	91.98%

Predictably, as the proposed price range increased, the number of respondents willing to pay more decreased. Among these respondents who indicated a WTP for leafy greens in sustainable packaging, 69.25% indicated a WTP between EUR 0.10 and EUR 0.50 more. Moreover, 27.23% were willing to pay between EUR 0.50 and EUR 1.00 extra, but only 3.52% would be willing to pay more than EUR 1.00 on top of the baseline EUR 2.00.

3.1. Sustainability Attitudes, Knowledge, and Habits

3.1.1. H1: The Importance of Sustainable Packaging

To gauge consumers' attitudes towards sustainable packaging, respondents were asked to rate the importance of sustainable packaging of leafy greens to them, from 1 to 5, where 1 was 'Not Important' and 5 was 'Extremely Important'. Overall, 82.98% of consumers ranked the importance of sustainable packaging of leafy greens as a '4' or '5' (n = 395).

There is a statistically significant relationship between WTP and a respondents' ranking of the importance of sustainable packaging of leafy greens ($\chi^2(4) = 25.415$, $p < 0.001$, Cramer's V = 0.231). Cramer's V indicates a moderate relationship between these variables.

Respondents who ranked the importance of sustainable packaging as a '1' (Not Important) were the least likely among respondents to be willing to pay more (n = 3, 37.50%) and were the only subgroup where respondents were more likely to be unwilling to pay more than willing to pay more (n = 5, 62.50%). Respondents who ranked the importance of sustainable packaging of leafy greens as '4' or '5' were the most likely to demonstrate a WTP, with over 90% of each group willing to pay more. Therefore, H1 has been supported in this context.

3.1.2. H2a: Waste Segregation Habits

To gauge waste segregation habits, consumers were asked how often they separate spoiled leafy greens from the packaging when discarding both.

Respondents who reported they 'Never' separate the leafy greens from the packaging were the least likely to be willing to pay more, compared to their counterparts who reported they 'Sometimes' or 'Always' separate the waste. However, the differences between these groups were not enough for there to be a statistically significant relationship between the behaviour and WTP ($\chi^2(2) = 1.030$, $p = 0.598$). Therefore, H2a has not been supported in this context.

3.1.3. H2b: Sustainability Literacy

As a measure of sustainability literacy, consumers were asked to rank their agreement/disagreement on a Likert-type scale to the statement "I find it difficult to distinguish between eco-friendly and non-eco-friendly packaging of leafy greens".

Unexpectedly, respondents who believed they could distinguish between eco-friendly and non-eco-friendly packaging of leafy greens (representing a high level of sustainability literacy) were the subgroup least likely to be willing to pay more for sustainable packaging ($n = 53$, 85.48%). Respondents who were neutral, agreed, or strongly agreed that it was difficult to distinguish between eco-friendly and non-eco-friendly packaging (representing a lower sustainability literacy) were more likely to be willing to pay for sustainable packaging ($n = 406$, 90.42%). Overall, there was no significant relationship between sustainability literacy and WTP ($\chi^2(4) = 2.653$, $p = 0.617$). Therefore, H2b has not been supported in this context.

3.2. Sustainability-Related Purchasing Habits

3.2.1. H3a: Frequency of Buying Organic

To gauge consumers' organic purchasing habits, they were asked whether they 'Never', 'Sometimes', or 'Always' opt for organic fresh leafy greens when buying their fresh leafy greens.

Predictably, respondents who reported 'Never' buying organic fresh leafy greens were the least likely subgroup to be willing to pay more for sustainable packaging ($n = 40$, 80.0%). Approximately 90% of respondents who 'Sometimes' or 'Always' opted for organic were willing to pay more for sustainably packaged leafy greens. However, the subgroup differences were not large enough to indicate a statistically significant relationship between these two variables ($\chi^2(2) = 5.384$, $p = 0.068$). This lack of a significant relationship has not supported H3a in this context.

3.2.2. H3b: Current Purchasing Habits

Respondents were asked to choose which 100 g, pre-packaged leafy greens product they would be most likely to buy based on their current purchasing habits: one that was conventionally produced and costs EUR 1.58 or one that was sustainably produced and costs EUR 2.00. They could also opt to be 'Not Sure'. The purpose of this question was to gauge respondents' purchasing habits related to price and sustainability simultaneously.

There was a statistically significant relationship between what type of leafy greens a person currently buys and their WTP for sustainably packaged leafy greens ($\chi^2(2) = 46.347$, $p < 0.001$). Knowing what type of leafy greens a respondent currently opts for allows us a 9.5% reduction in error in predicting their WTP for sustainable packaging. Respondents who opted for more expensive, sustainably grown leafy greens were more likely to be willing to pay more ($n = 275$, 96.15%) compared to respondents who opted for the less expensive, conventionally produced products ($n = 76$, 72.38%). This statistically significant relationship supports H3b in this research.

3.2.3. H3c: Choosing the Less Harmful Option When Available

To gauge overall eco-friendly purchasing behaviours, respondents were asked how they agree/disagree on a five-point Likert-type scale with the statement "When I have a choice between two equal leafy greens, I always choose the one that is less harmful for the environment".

There is a statistically significant relationship between respondents' overall eco-friendly purchasing habits and their WTP for leafy greens in sustainable packaging ($\chi^2(2) = 8.866$, $p = 0.012$, Cramer's $V = 0.136$). However, Cramer's V indicates a weak relationship between these variables. Predictably, respondents who disagreed or strongly disagreed with this statement were the least likely to be willing to pay more ($n = 24$, 80.00%). Respondents who agreed or strongly agreed that they do opt for the sustainable option were the most likely subgroup to be willing to pay more for environmentally friendly leafy greens ($n = 321$, 91.98%). Therefore, H3c is supported in this context.

3.3. Interactions between Variables

The table below (Table 3) shows the Pearson correlation values between all variables analysed in this research. Consumers' ranking of the importance of eco-friendly packaging, their price- and sustainability-related purchasing habits, as well as their overall eco-friendly purchasing habits, were significantly correlated with all other variables except sustainability literacy.

Table 3. Pearson correlations between all variables.

Variable	(1)	(2)	(3)	(4)	(5)	(6)
(1) Willingness to Pay	-					
(2) Waste Segregation Habits	0.024	-				
(3) Sustainability Literacy	0.016	−0.059	-			
(4) Importance of eco-friendly packaging	0.149 **	0.206 ***	0.088	-		
(5) Organic Purchasing Habits	0.069	0.128 **	−0.062	0.187 ***	-	
(6) Price- and sustainability-related purchasing habits	0.308 ***	0.125 **	−0.027	0.332 ***	0.271 ***	-
(7) Overall eco-friendly purchasing habits	0.134 **	0.141 **	−0.068	0.359 ***	0.234 **	0.402 ***

** $p < 0.01$; *** $p < 0.001$.

As above, attitudes towards sustainable packaging, price- and sustainability-related purchasing habits, and overall eco-friendly purchasing habits were significantly correlated with WTP.

In a binary logistic regression with all three significant variables, if a person's attitudes towards the importance of sustainable packaging are known, once their current purchasing habits are added in, only their current price- and sustainability-related purchasing habits make a meaningful contribution to understanding consumers' WTP (Table 4).

Compared to respondents who reported currently opting for the cheaper, traditionally produced leafy greens, respondents who were 'not sure' which option they would choose were 2.67-times more likely to demonstrate a WTP (OR(95% CI):2.666 (1.177–6.039), $p = 0.019$). Respondents who currently opt for the more expensive option were 8.57 times more likely to demonstrate a WTP than consumers who currently opt for the cheaper option (OR(95% CI):8.573 (3.798–19.350), $p < 0.001$).

Consumers' overall eco-friendly purchasing habits made no significant difference in the model. Respondents who were neutral or agree/strongly agree that they choose the less harmful option were not significantly more likely to demonstrate a WTP than those who disagree/strongly disagree.

Table 4. Willingness to pay binary logistic regression with ranking of importance of sustainable packaging, current price- and sustainability-related purchasing habits, and overall eco-friendly purchasing habits.

	β (SE)	95% CI (Lower)	Odds Ratio	95% CI (Upper)
Constant	0.563	(0.651)	1.755	
From 1 to 5, how important is sustainable (eco-friendly) packaging of fresh leafy greens to you	0.136	(0.152)	0.850	1.543
Current Purchasing Habits: Cheaper Option (reference)				
Current Purchasing Habits: Not Sure	0.981 *	(0.417)	1.177	2.666
Current Purchasing Habits: More Expensive Option	2.149 **	(0.415)	3.798	8.573
I always choose the less harmful option: Disagree/Strongly Disagree (reference)				
I always choose the less harmful option: Neutral	−0.145	(0.570)	0.283	0.865
I always choose the less harmful option: Agree/Strongly Agree	−0.097	(0.568)	0.298	0.907

* $p < 0.05$; ** $p < 0.001$; note: $R^2 = 0.085$ (Cox & Snell), 0.173 (Nagelkerke). Model $\chi^2(5) = 42.147$, $p < 0.001$.

4. Discussion

4.1. H1: The Importance of Sustainable Packaging

Consumers' preferences for sustainable packaging indicated that they were willing to pay more for things they deem important, as is often the case in research regarding sustainability and green attitudes [15–17]. This result corroborates Bullock et al.'s finding that Irish consumers do demonstrate a hypothetical WTP for sustainable packaging [4]. This result should also, however, be mediated by Bullock et al.'s [4] finding that consumers generally prefer cheaper options overall.

Sustainable packaging may be a mobilising factor for consumers who think it is important, but it alone should not be fully trusted to predict real world purchases. Rather, the moderate, positive relationship between WTP and the ranking of the importance of sustainable packaging of leafy greens may add to the attitude–behaviour gap. Consumers' attitudes were so heavily skewed towards sustainability that their WTP was not realistically translatable into real world purchases. This effect has also been seen in other research on sustainability-related packaging purchases, such as in Herrmann et al. [19] and Rokka and Uusitalo [29].

4.2. H2a and H2b: Waste Segregation Habits and Sustainability Literacy

Unlike Popovic et al. [23], this study found no significant relationship between consumers' waste segregation habits and their WTP for sustainable packaging. Therefore, waste segregation habits cannot be used to mediate the attitude–behaviour gap.

From the results on sustainability literacy, it can be deduced that consumers are equally (un)willing to pay for sustainable packaging, regardless of how easy or difficult it is for consumers to identify it. Sustainability literacy, therefore, cannot bridge the attitude–behaviour gap. The ability to add soft plastics to home recycling in Ireland since 2021 might contribute to an apathy towards identifying sustainable packaging, as it might be assumed that any packaging could be recycled.

This finding also adds support to the popular idea that sustainable packaging must be easily identifiable and trustworthy for meaningful consumer uptake [40,41]. If consumers cannot identify or trust the sustainable packaging, they will not have a meaningful opportunity to purchase it, let alone properly dispose of it.

4.3. H3a, H3b, and H3c: Current Purchasing Habits

Based on similar studies and the price differentials between organic and non-organic produce, the lack of a significant relationship between organic purchasing habits and WTP was unexpected. This research found that consumers who purchased organic foods were not necessarily swayed to purchase otherwise sustainable food; they may consider organic options to be sufficiently eco-friendly. Similarly, Bastounis et al. [12] found that sustainability labels were less effective at driving up WTP than were organic labels.

It may also be the case that consumers who are already opting for organic produce are already at their upper price limit. Zepeda and Deal [26] found that, among consumers who intentionally and often purchase organic foods, 91% found that price was still a barrier to consumption. Increasing the price further to account for sustainable packaging, therefore, would likely not increase purchasing behaviour. This is supported in this research by the fact that consumers who bought organic produce were significantly more likely to, based on current purchasing habits, say they opt for the more expensive option and choose the less environmentally harmful option.

Despite this, consumers' current organic purchasing habits are not related strongly enough to their WTP for sustainable packaging such that the attitude–behaviour gap can be bridged.

This research corroborates findings that habits can play an important part in food- and sustainability-related purchasing behaviour [26,48]. Finding that consumers who currently opt for a more expensive option would be willing to pay more for sustainable packaging is evidence of purchasing habits having a positive relationship with WTP. This demonstrates

that current purchasing habits simultaneously related to price and sustainability can be used to bridge the attitude–behaviour gap.

From this example, we can deduce that price is likely a stronger contributing factor than the sustainability of the product for the purchasing decision, as the price differences here are large relative to the price. Where consumers may express a WTP but currently opt for the less expensive option, their actions represent the disconnect often found between idealised purchasing habits and actual purchases. If they presently opt for the less expensive option, their habits are likely to keep them from switching to a more sustainable leafy green product.

The subgroup of consumers who believe they ‘always choose the less environmentally harmful option’ was composed of 73.32% of respondents overall (n = 349). Used as a consumer market segment, this subgroup would be the one most likely to engage with more expensive, environmentally friendly leafy greens. However, while using this variable does reduce the size of the sample who indicate a WTP, the size of this subgroup still implies it is not a complete mediator of the attitude–behaviour gap found in sustainability research.

The measurement of overall eco-friendly purchasing habits illustrates that current purchasing habits can again be used as an indicator of future WTP for a package of environmentally friendly leafy greens. However, this variable alone does not contribute meaningfully to a model to bridge the attitude–behaviour gap between intention and practice with regard to paying more.

5. Conclusions

This research has bridged the literature gap on consumers’ attitudes and behaviours regarding environmentally friendly leafy greens. Overall, many consumers held pro-environmental attitudes regarding sustainable packaging of fresh leafy greens and demonstrated a WTP (willingness to pay) for environmentally friendly leafy greens.

Non-purchase related sustainability habits and knowledge (waste segregation and sustainability literacy) and organic purchasing habits were insignificantly correlated with consumers’ WTP for environmentally friendly leafy greens. Consumers’ attitudes towards sustainable packaging, their current price- and sustainability-related purchasing habits, and their current overall sustainable purchasing habits related to leafy greens were all significantly correlated with their WTP for environmentally friendly leafy greens.

The significance of two of the three current purchasing habits proposed here indicates that habits should be used to mediate the attitude–behaviour gap.

In practice, sustainable packaging may not convert a large market share to change their purchasing habits. However, people who currently spend more money on what they perceive to be sustainable leafy greens compared to cheaper, non-sustainable leafy greens will continue to do so and may be absorbed into the sustainable packaging market. One of the managerial implications of this research lies in the knowledge that sustainable packaging is extremely important to many consumers.

Attitudes, as suggested by the Theory of Planned Behaviour, are an important part of sustainability research regarding WTP. This research supports other research that habits have continuously been found to be mediating factors in sustainability and predicting WTP. Therefore, the theoretical basis for future sustainability research should include habits as a strong predictor of future WTP and future purchases. In practice, this means that the sustainable fresh food industry must take into account present consumer behaviour to mitigate any overly positive intentions to purchase their sustainable but more expensive products.

5.1. Study Shortcomings

The attitude–behaviour gap found in sustainability-related research often arises from biases and wishful thinking. Survey data is important to supplement and understand consumer behaviour, but the nature of the attitude–behaviour gap calls for more real-world evidence (even from a discrete choice experiment, for example) to truly understand the difference between current purchasing habits, attitudes, intentions and real-world

purchases. This study would have benefited from semi-structured interviews to supplement the data and enhance its richness.

Due to the survey's sampling methods, voluntary nature, and lack of incentive, this survey was subject to self-selection biases. It was expected that participants would have a pre-existing interest in topics related to the survey. The sample was relatively homogenous in having positive attitudes towards sustainable purchasing behaviours, as evidenced by nearly three-quarters of respondents saying they 'Agree' or 'Strongly Agree' that they always choose the less environmentally harmful leafy green option when given the opportunity. This may be because of self-selection bias, social desirability biases, or both.

Social desirability biases are also potential barriers to response accuracy. To combat this, the survey was anonymous and self-administered. However, strong attitudes and social pressures surrounding sustainability can still bias responses and cause a "mismatch between self-reported and observed pro-environmental behaviour" [21] (p. 2). While it is hard to counter these biases, it is important to acknowledge their existence as a trend in research.

Compared to national demographics, the sample was heavily skewed by respondents with third-level qualifications ($n = 439, 92.23\%$).

5.2. Future Research

Continuing research on the topic of sustainable packaging of fresh leafy greens, there is a good opportunity to research whether sustainability preferences can overtake brand loyalty in the fresh food sector. There should also be research to understand why consumers who purchase organic food are unwilling to spend more for sustainable packaging, especially considering organic produce is always packaged so it can be distinguished from non-organic produce.

Additionally, there is a need to understand the barriers growers and retailers face in transitioning to sustainable packaging for fresh leafy greens.

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