

Food interests, preferences and behaviours: a profile of the sustainable food consumer

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Abstract

Purpose – Sustainability challenges are omnipresent. This study aims to identify consumer segments based on food consumption practices from purchasing to disposal. A priori work identified quality attributes, food responsibility, dietary choices and food organisation and management within the home as key influences. Each represents an opportunity for consumers to employ more sustainable food behaviours. A priori work identified several indicators for each of these influences. This study explored the suitability of these indicators for measuring the identified key influences.

Design/methodology/approach – The authors used an online survey of 324 Irish food consumers in January 2021 to address online food interests, purchasing preferences and purchase behaviour linked to food sustainability.

Findings – The authors identify four consumer segments – food dabblers, food appreciators, pro-sus and pressured – which present a holistic view of the sustainable behaviours practiced by food consumers. The findings provide insight into the range of sustainability-related food behaviours actioned by consumers – from interest in meat-free products, organics and local produce to having an organised stock at home and minimising waste. The findings shed light on how consumers integrate elements of sustainability into their food lifestyles.

Originality/value – This study captures sustainability-related food behaviours from the point of purchase through to consumption and disposal and identifies four new consumer segments based on interests, preferences and behaviours.

Keywords Sustainable consumer, Food consumption, Segmentation, Food responsibility

Paper type Research paper



Introduction

Consumers play a significant role in addressing the sustainability challenges of food systems (Hedin *et al.*, 2019; Vermeir *et al.*, 2020; Verain *et al.*, 2015). Globally, 36% of household material footprint (a consumption-based indicator of resource use) (Wiedmann *et al.*, 2015) is attributed to food consumption (Ivanova *et al.*, 2015). The food choices and food consumption-related behaviours of consumers is increasingly important (Vermeir *et al.*, 2020). Reported consumer demand for healthy, sustainable food continues to rise (Pricewaterhouse Coopers (PwC) 2021). However, consumers tend to hold producers and manufacturers accountable for making food systems more sustainable (Eurobarometer, 2020; Mintel, 2021) indicating a lack of consumers' sense of responsibility (Luchs *et al.*, 2015). As much as 30% of the environmental impact of European Union (EU) households can be attributed to food consumption practices (Notarnicola *et al.*, 2017). Over half of all food wasted in Europe is concerned with food waste at the household level, mainly due to poor food management habits and behaviours (Principato *et al.*, 2020). Thus, the role of consumers in terms of their product choices and food behaviours (e.g., buying local produce or curtailing meat consumption) is crucial (Vermeir *et al.*, 2020; Verain *et al.*, 2015). Quality attributes, approaches and responsibility around cooking and storing food, dietary choices, and food waste generation are all implicated (Tukker and Jansen, 2006; Reisch *et al.*, 2013). Consequently, private households, as key actors in this context, are essential in emerging solutions (Schanes *et al.*, 2018). According to McKinsey and Company, a new shopping reality exists for consumers with an increase in basket size, a decrease in shopping frequency and an increase in online grocery shopping, alongside a rise of 54% points for cooking within households (McKinsey and Company, 2020). However, it is not clear whether these changes will persist over time (Giudice *et al.*, 2020). Transitioning to circular economy principles has been noted as a means of bolstering the sustainability of food systems. This requires circular food behaviours, such as conscious consumption practices and consumer demand for green products by consumers (do Canto *et al.*, 2021). Fittingly, according to EU communications, 'green recovery' is central to the post-pandemic world (see Giudice *et al.*, 2020).

This study aims to identify consumer segments based on key food consumption practices. Unlike previous studies that focus solely on point-of-purchase behaviours (Carrero *et al.*, 2016; Polzin *et al.*, 2023; Su *et al.*, 2019) or routines in the household (Chen, 2023; Jastran *et al.*, 2009; Marshall, 2005), this study considers consumption behaviours ranging from point of purchase to point of disposal. A priori work identified quality attributes, food responsibility, dietary choices, and food organisation and management within the home as key influences. A priori work has also identified several indicators for each of these influences, with this study exploring the suitability of these indicators to measure the identified key influences. Broader willingness to engage in environmentally friendly practices beyond food-related behaviours is also considered.

Sustainability-related food behaviours

Europeans prioritise taste, safety and cost over sustainability concerns (such as climate change, biodiversity loss and carbon emissions) (Eurobarometer, 2020). Mintel's (2021) report supports this by highlighting that "*consumers won't compromise on quality or brand familiarity in the name of sustainability*" (Mintel, 2021, p. 16). With regard to the range of sustainable consumer behaviours, the most popular are those that are simple and frugal (Mintel, 2021). Notably, Generation Z consumers are mostly aspirational about sustainability-related behaviours, with their widely reported eco-sensitivity appearing to be overrated and ideals are not translated into purchasing behaviour (PwC, 2021). Food considerations, particularly in wealthier societies, are complex (Verain *et al.*, 2012). People may lack a clear understanding of the environmental threats to humanity or who should be responsible

(Thøgersen, 2014). Emphasis has been placed on individuals' dual roles as citizens and consumers to address environmental sustainability issues via green consumerism (e.g., purchasing fair trade and organic, buying less packaging, and supporting local producers) (Barr *et al.*, 2011; De Tavernier, 2012; Tittarelli *et al.*, 2022). However, the checkout is not the only place where consumers can make a difference. The reality of everyday practices (e.g. shopping, cooking and eating) is that habits or routines are embedded in consumers' social, structural and cultural lives (Southerton, 2012).

The heterogeneity and richness of pro-environmental behaviour have been well documented in the segmentation literature (Haider *et al.*, 2022; Lavelle *et al.*, 2015; McDonald *et al.*, 2012). Many studies have focused on food consumption (Carrero *et al.*, 2016; Macharia *et al.*, 2013; Su *et al.*, 2019; Verain *et al.*, 2012, 2015). Environmental values and concerns, socio-demographic variables, and psychological factors have dominated much of this research (Testa *et al.*, 2021). Empirical research tends to focus on point-of-purchase settings (e.g., Carrero *et al.*, 2016; Su *et al.*, 2019) or habitual behaviours (e.g., Chen, 2023; Gilg *et al.*, 2005). Less attention has been paid to understanding sustainable behaviours at various stages of the consumption process. From purchase to disposal, each step represents a touchpoint for enhancing or compromising sustainable food practice. Sustainability-related food behaviours in this study refer to quality attributes (e.g., purchasing local food), food responsibility (e.g., using a shopping list), dietary choices (e.g., adopting vegetarianism) and food organisation and management within the home (e.g., avoiding food waste).

Regarding dietary choices, experts have advised shifting to diets that include more wholefood plant-based and less meat-based foods (Willett *et al.*, 2019; Lea *et al.*, 2006). As a result some citizens are reducing their meat intake and consuming vegetarian meals and associate such actions with being more sustainable (Sanchez-Sabate *et al.*, 2019). In addition to recommendations on what to eat, certain food quality attributes are associated with being more sustainable. Local/domestically produced, seasonality, organic, along with fairtrade have been associated with a more sustainable system (Macdiarmid, 2014; Zepeda and Deal, 2009). Generally, foods promoting these characteristics are perceived as more expensive and as a result may not be chosen by those who are price sensitive (Verain *et al.*, 2012; Aschemann-Witzel and Zielke, 2017). Indeed, consumers may choose engage in one or the other – sustainable product choice strategy based on product attributes (e.g. organic, local, free range, etc.), or engage in consumption curtailment strategies (e.g. reduce quantities of meat consumption). Consumers are likely to differ in the strategies which appeal to them most, and thus their sustainable behaviours may centre around one strategy over the other (Verain *et al.*, 2015). Given the consensus around the resource intensity of animal-based products, many advocate curtailment or abstinence (e.g. decreasing portion size, decreasing frequency or adopting vegetarian/veganism) within this food category to address and lower the sustainability impact of one's diet (see Garnett, 2011). In Verain *et al.*'s (2015) distinction between product-oriented consumers and curtailers, where sustainability motives and subjective knowledge of sustainable food predict both types of behaviour, they found that product-oriented consumers attach more importance to social norms and are subjective in their judgements of sustainable foods, whereas curtailers are usually older, female and have lower incomes. However, eating meat is deeply embedded in the routines of everyday life, and thus reducing or omitting meat poses significant challenges in contexts where meat consumption is expected and desirable (Mylan *et al.*, 2016). Indeed, as attested by Carrigan (2017, p. 17), consumer responsibility '*manifests itself flexibly*' and is impacted by complex contextual influences. Empirical evidence suggests that, despite positive attitudes towards 'green' products and intentions to purchase, this does not consistently follow through to the checkout or result in long-term sustainable behaviours, resulting in the well acknowledged attitude-behaviour gap (Moraes *et al.*, 2012; Szmigin *et al.*, 2009; Tittarelli *et al.*, 2022; Yamoah and Acquaye, 2019).

Nonetheless, reducing food consumption, particularly in the Global North, is one of the most critical strategies for sustainable consumption; however, very few studies have investigated this (do Canto *et al.*, 2021). Where the issue of overconsumption is researched it is based primarily on reducing food waste (Gollnhofer, 2017; Makhal *et al.*, 2020) or curtailing the consumption of animal-based products (Verain *et al.*, 2015). Renewed interest in local food supply chains as a means of transitioning to sustainable food consumption offers economic, environmental and social benefits. Purchasing from local, short supply chains ‘reduces storage and transportation, provides a better supply-demand balance, creates more transparency and tracking and contributes to waste reduction’ (Giudice *et al.*, 2020, p. 11). Indeed, food purchased from local channels is ascribed a higher value by consumers and, consequently, is much less likely to enter the waste stream (O’Neill *et al.*, 2022).

With regards to food organisation and management, consumers do not hold a careless disregard for food they waste at home (Evans, 2012a). Rather, food-related routines such as meal planning, shopping, cooking, eating, storing and cleaning routines play a major role in food waste (Stancu *et al.*, 2016) and “[...] food waste is a largely unintended outcome of entangled daily routines revolving around food” (Dobernic and Schanes, 2019, p. 480). Impulse buying is a significant antecedent of food waste (Lahath *et al.*, 2021; Porpino *et al.*, 2015; Schmidt, 2016). For food responsibility, consumers who do not plan their grocery needs and who shop without shopping lists are more exposed to marketing cues and internal stimuli such as emotions which may result in impulsive buying (Massara *et al.*, 2014). Specifically, making shopping lists, meal planning and checking food stocks before shopping have all been shown to reduce food waste (Quested *et al.*, 2013). Additionally, activities around waste minimisation also represent an action that households can take to be more sustainable (Thøgersen and Grunert-Beckmann, 1997; Aschemann-Witzel *et al.*, 2015). In the case of food, the use of leftovers, how people deal with foods past its best-before-date and attitude to generating food waste could influence this. Where prior planning doesn’t occur and impulse buying leads to surplus, consumers try to manage the “anxiety laden” process of wasting food via complex procedures that allow them to dispose of surplus or leftovers with as little guilt as possible (Evans, 2012a, b). While the majority of the food surplus ends up in the waste stream, it is usually not immediately put there. Rather, procrastination around wasting food means that it is stored, usually in the fridge, and then “quietly but actively forgotten” (Evans, 2012b, p. 1130) until rendered inedible and placed in the bin (Evans, 2012a, b).

Food marketing and retailers contribute to consumer-related food waste via expiration date confusion, pricing strategies and encouragement to impulse purchase large pack sizes (Aschemann-Witzel *et al.*, 2016; Davenport *et al.*, 2019). Purchasing food online may lead to an increased likelihood of wasting food due to psychological distance (Ilyuk, 2018) or may lead to less waste due to less impulse purchasing and more structured eating habits (Berg and Henriksson, 2020). Here, recognising the material context of food practices is important, as it highlights how the infrastructure of provision, and indeed the material properties of the food itself, affects food waste (Evans, 2012a; Mylan *et al.*, 2016).

Methods

Procedure and respondents

We collected data through an online survey of Irish food consumers conducted in January, 2021. The survey formed part of the Horizon 2020 ERA-NET SUSFOOD (SUStainable FOOD) (Horizon, 2020) project “PLATEFORMS” and included questions addressing online food purchase behaviour, purchasing preferences and food choice motivations, attitudes and behaviours that are linked to food sustainability. The draft online survey was piloted with a sample of 40 respondents. Ethical approval for this study was obtained from the Social Research Ethics Committee of the University.

According to [Berry \(2018\)](#) online grocery shopping in Ireland accounts for a small proportion of purchase at 2.2% (of sales) with an average grocery spend per online purchase in 2017 of €66.43. At the point of undertaking the survey in January 2021 this had changed due to the lockdown, with for example, [McKinsey and Company \(2022\)](#) suggesting that sales had increased by 50% in North America during the pandemic. However, even with such an increase, the overall percentage of the population engaging in online grocery shopping remains low. This presented a survey recruitment challenge. As a result the survey was delivered online via the Qualtrics platform (QualtricsXM, Dublin, Ireland) to their consumer panel. Standard quality control protocols were in place to ensure the integrity of the data (e.g., avoidance of over-surveying participants and professional survey takers). As an addition precaution, to capture a diverse set of users, quotas were set to ensure a balanced sample on gender (minimum to 40% for male or female) and age (50% under 45 and 50% 45 and older). We also sought to recruit a mix of urban and rural dwellers. Descriptive statistics for the sample are presented in [Table 1](#). A total of 400 respondents were recruited for the study. Data cleaning excluded 66 participants from the analyses because of a lack of dispersion in their responses to a range of variables. With regard to adequacy of sample size for factor analysis, consideration was given to accepted guideline which indicates that a sample size should ensure 10 to 20 observations per variable ([Nunnally, 1978](#); [Arrindel and van der Ende, 1985](#); [Pett et al., 2003](#)). For the purposes of exploring key influences on sustainable food consumption practices, 17 variables were identified and included in this study (see [Table 2](#)), consequently sample size was set at 400 to ensure adequacy of sample size. Data analysis was conducted using Statistical Package for the Social Sciences (SPSS) version 28.

Measures

Purchasing behaviour questions. We measured the frequency of online purchases for 14 food categories with a five-point frequency ordinal scale ranging from once a week to never. These

Variable	Level	N	%	Variable	Level	N	%	
Age	18–29	63	19.4	Number of children in house	1	62	19.1	
	30–44	137	42.3		2	164	50.6	
	45–60	78	24.1		3+	98	30.2	
	>60	46	14.2			Total	324	100
	Total	324	100			Highest education level achieved	Primary	8
Number of children in household	0	187	57.7	Secondary	63		19.4	
	1	60	18.5	Post-secondary	70		21.6	
	2	51	15.7	University level	183		56.5	
	3+	26	7.7	Total	324		100	
	Total	324	100	Self-identified social class	Upper and upper middle	50	15.4	
Occupation status	Full-time paid ¹	182	56.2		Middle class	184	56.8	
	Part-time paid ²	50	15.4		Lower middle class	72	22.2	
	Unemployed	20	6.2			Lower class	18	5.6
	Other ³	72	22.2			Total	324	100
	Total	324	100	Gender	¹ more than 30 h work per week			
Female	188	58.0	² between 15 and 29 h work per week					
Male	136	42.0	³ others include student, homemaker, retired, etc					
Total	324	100						

Table 1. Socio demographic sample profile

Source(s): Authors work

	Label of characteristics	Statement 1	Statement 2
Organisation and planning	HH preparation responsibility	I am responsible for most of the cooking in my household	I am rarely involved in the preparation of food in my household (RS)
	HH provisioning responsibility	I am responsible for most of the food purchases in my household	I am rarely involved in providing food to the household (RS)
	Organised purchasing	I usually use a shopping list	I frequently buy food products I had not planned to buy
	Organisation	I have a good overview of the food I have at home	I often find food in my kitchen that I had forgotten about
Product choice attitudes and purchases	Seasonality	I mainly buy fresh fruits and vegetables that are in season	I am not very interested in the seasonality of products
	Domestic COO	I prefer domestically produced food	I rarely check the country of origin of the food I buy
	Organic	I prefer organic food	I rarely buy organic food
	Price quality	I value quality over price	I usually choose the cheapest option
	Local	I prefer locally produced food	I am not very interested in locally produced food
Dietary choice	Fair price for producer	I prefer products where I can be sure that the producer has received a fair price	I seldom choose Fairtrade products
	Five a day	I eat at least five portions of fruits and vegetables a day	I eat very little fruit and vegetables
	Reducing meat	I try to avoid consuming red meat	I have meat-based meals most days
	Increasing vegetarian	I eat vegetarian meals at least every second day	I seldom eat vegetarian meals
Surplus, leftovers and waste	Ready meals	I cook most of my meals from scratch	I frequently buy ready-made food
	Best before	I sometimes eat food even if it has past the best before date	I always throw away food that is past the best before date
	Managing leftovers	I store and use leftover food	I rarely eat leftover food
	Minimise creating waste	I try to avoid creating food waste	I sometimes find food in my kitchen that has gone off

Note(s): Question: How well do the following statements describe you as a food consumer? Answer on a 7-point scale, where 1 is DOES NOT DESCRIBE ME AT ALL and 7 is DESCRIBES ME VERY WELL

Source(s): Authors work

Table 2. Sustainability related practices indicators – Food interests, preferences and behaviours statements

frequency data were used to profile the identified segments. The 14 categories were dairy products and eggs, meat and meat products, fish and seafood, bread and bakery products, fresh fruit and vegetables, oils, cans/bottled food products, seeds, dried fruits and pulses, non-alcoholic beverages, alcoholic beverages, coffee and tea, snacks, chocolate and candies, pasta, rice and grains, and products for special dietary needs.

Sustainability related practices indicators: food interests, preferences and behaviours indicator statements. In addition to literature informing the broad food sustainability activities of households, as previously discussed, an informant perspective was used to identify the behaviour and practice characteristics that were relevant to this study. An earlier stage in the

work involved in depth interviews to identify the most salient behaviours and preferences that consumers associate with sustainable practices. These behaviours and preferences relate to pre-purchase planning, acquisition, dietary preferences, product attribute preferences, food management in the household, and dealing with waste and surplus. This work was undertaken by research partners in the Platforms SUSFOOD2 funded research project. Following an initial analysis of country specific data (Norway, Sweden, German, Italy and Ireland) the project team jointly discussed participant behaviours and characteristics that were connected to sustainability and how this translated into measures. Dietary choices (e.g. avoiding meat, eating vegetarian meals), product attribute choices (e.g. seasonality, origin) and organisation and management of food related activities (e.g. responsibilities, shopping planning, and managing leftovers) were common themes across all partner countries. The statements allowed for conflicting perspectives on the same characteristic created due to issues such as cognitive dissonance. [Table 2](#) presented these statements.

Indicators of sustainability were developed through the measurement of 17 food behaviour and practice characteristics. Two statements per characteristic (one positive and one negative), which have been associated with food sustainability in consumers everyday food lives, were employed. Using 7-point Likert type scale response statements, respondents were asked to indicate how well each statement described them from not at all (1) to very well (7). Each indicator score was calculated by subtracting the negative from the positive item, with scores ranging from 6 to -6. A higher score indicate that the consumer is displaying more of the measured characteristic. [Table 2](#) presents the statements for each of these indicators.

“Being more sustainable” measures. Two measures of ‘being more sustainable’ were included. The first was an intention to change food behaviours for sustainability reasons and reflects a widely used stages-of-change measure. Respondents were asked to indicate which of six behaviour change options best described them (the options are presented in [Table 5](#)). The second represented willingness to be environmentally friendly and included six statements from the scale designed by [Kautish et al. \(2019\)](#), based on the work of [Abdul-Muhmin \(2007\)](#) and [Zabkar and Hosta \(2013\)](#). These measures were used to profile the segments.

As outlined in the results section, exploratory factor analysis using principal component analysis with varimax rotation was applied to identify the underlying structure within a set of observed variables ([Stewart, 1981](#)). Interrelationships among statements are identified and represented through underlying dimensions (factors) ([Hair et al., 1998](#)). This method is commonly used in similar segmentation studies ([Grunert et al., 1998](#); [Ryan et al., 2002](#); [Buckley et al., 2007](#)). K-means clustering was conducted to identify segments. Both parametric and non-parametric tests were applied with similar results observed. In such situations, as suggested by [Turner et al. \(2020\)](#), it is reasonable to report non-parametric equivalent. Thus ANOVA (analysis of variance) with post-hoc Bonferroni tests were employed to identify significant differences based on attitudinal and behavioural preferences between these segments.

Results

Exploratory factor analysis, using principal component analysis with varimax rotation, was applied to identify the underlying structure within a set of observed variables ([Stewart, 1981](#)). Interrelationships among statements are identified and represented through underlying dimensions (factors) ([Hair et al., 1998](#)). This method is also used in many segmentation studies ([Grunert et al., 1998](#); [Ryan et al., 2002](#); [Buckley et al., 2007](#); [Wongprawmas et al., 2021](#)).

The seventeen sustainability related practices indicators (presented in [Table 2](#) and discussed in the methods section) based on various stages of food consumption (from purchase planning to waste management) were included in the factor analysis. Statements with a <0.40 factor loading on more than one factor were excluded as scores of over 0.4 are considered stable ([Guadagnoli and Velicer, 1988](#)). Following this approach, four factors (measured by 12

indicators) that explained 60.86% of the data variation were identified. The Kaiser-Meyer-Olkin measure of sampling adequacy (0.78) and Bartlett’s test of sphericity ($\chi^2 = 1351.2845$; p -value < 0.001) confirmed the suitability of these data for factor analysis. The final factor solution made sense in the context of food practices. Reliability analysis using Cronbach’s α was performed to test the reliability and internal consistency of each of the four factors (see Table 3). Cronbach’s coefficients range from 0.54 to 0.85. Based on Streiner’s (2003) observations, these coefficients were deemed satisfactory. Three of the four factors identified have coefficient alpha of 0.8, however one factor, “organisation”, has 0.54. We retained this due to its relevance. While less than ideal, “organisation” captures a number of relevant variables (minimising waste, managing leftovers, organising purchasing). Further, presentation of the items used may serve to prompt future research that explores this “organisation” construct. The factors, statements, factor loadings and reliability coefficients are presented in Table 3.

The first factor, *Quality Attributes*, represents the potentially important product attributes associated with sustainability. These include local trade, seasonal trade, fair trade and country of origin. The second factor, *Food Responsibility*, includes statements addressing the level of responsibility the individual has in the provisioning and preparation of food in the household. The third factor, *Dietary Preferences*, relates to meal choices associated with more environmentally sustainable practices. This factor focused on avoiding meat and consuming vegetarian meals. The fourth factor, *Organisation*, represents the degree to which food practices are planned and organised. This includes the tendency to be organised when purchasing food, managing leftovers and avoiding food waste.

To identify the existence of segments, K-means clustering was conducted using the food provisioning practices factor scores. A range of cluster solutions (2–5) was evaluated by comparing the mean variable scores across the identified clusters. Based on this assessment, a four-cluster solution was identified as the best explanation for these data and reflected the differences in the sample population. The clusters were named based on their distinguishing features. The segments identified are labelled, “*Food Dabblers*”, “*Food Appreciators*”, “*Pro-Sus*” and “*Pressured*”.

Figure 1 illustrates the relative positioning of each identified segment on the segmenting variables, while Figure 2 provides this detail at the sustainability indicator level. *Food*

	μ (SD)	Quality attributes	Responsibility	Dietary preferences	Organisation
Local	1.11(2.08)	0.821			
Domestic COO	0.49(1.83)	0.801			0.225
Price quality	0.33(1.73)	0.763			
Seasonality	0.59(2.30)	0.762	0.275		
Fair price for producer	0.54(1.72)	0.682			
HH provisioning responsibility	0.54(1.72)		0.885		
HH preparation responsibility	0.077(1.83)		0.884		
Reducing meat	0.17(2.43)			0.897	
Increasing vegetarian	-0.61(2.17)			0.892	
Minimise creating waste	-0.13(2.11)				0.734
Managing leftovers	0.91(2.20)		0.40		0.669
Organised purchasing	0.54(2.05)				0.628
α -score		0.847	0.828	0.791	0.540

Source(s): Authors work

Table 3.
Segmentation variables included in Factor Analysis



Figure 1.
Radar plot of mean factor scores by segmenting variable

Source(s): Authors work

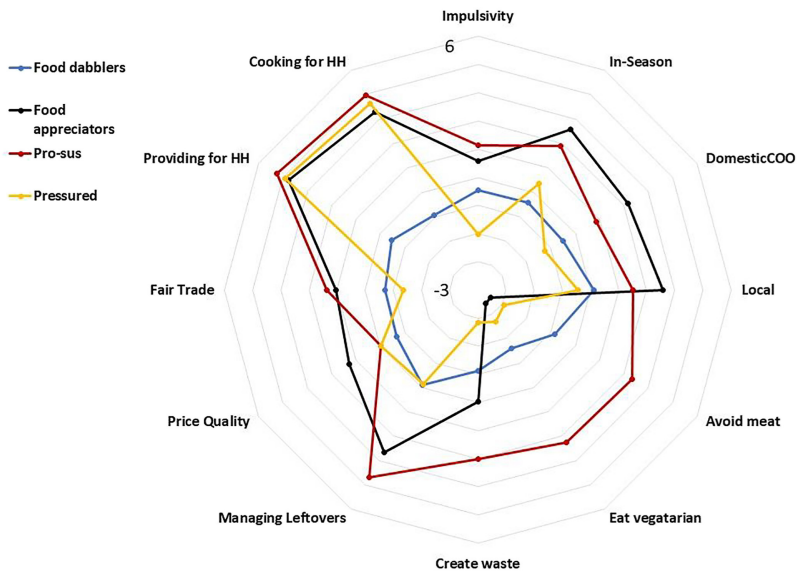


Figure 2.
Segment profile based on sustainability indicator scores

Source(s): Authors work

Dabblers are distinguished from other segments by their lower levels of responsibility for food and meal provisioning. *Food Appreciators* display strong interest in quality-related food choice attributes. The *Pro-Sus* segment tends to engage in a range of practices linked to positive sustainability outcomes. Their dietary choices and organisation of food activities, to

a lesser extent, suggest that they are taking personal responsibility for food sustainability. Finally, the *Pressured* segment, while responsible for household food provisioning, is not interested in food-related practices, and food is a chore for them.

The detailed profiling of each segment follows and is supported by the information presented in Tables 4–7. ANOVA-analysis with post-hoc Bonferroni tests was employed to identify significant differences based on attitudinal and behavioural preferences (Table 4). This profile examines differences at the factor level and further explores this by considering the core measures that primarily represent each factor. Segments were also profiled based on their intention to change food behaviours for sustainability reasons and online food purchase behaviours in food categories (Tables 5 and 6). Finally, segments were profiled based on demographic characteristics: age, gender, occupation, number of adults and dependents in the household, education levels, social classification and dwelling location (urban/rural). The characteristics of the significant differences are presented in Table 7. No significant differences were observed in education level, number of dependent children and dwelling location ($p > 0.05$).

Segment 1: Food Dabblers (n = 104, 32%)

The “*Food Dabblers*” segment is less likely than the other segments to take responsibility for acquiring and cooking food in their homes (p -value < 0.001). For example, their mean scores of 0.54 and 0.77 for food preparation and food purchase respectively compared to 5.24 and 4.97 in the case of the *Pro-Sus* segment (Table 4). They are most likely not the primary food

	Statements (mean \bar{x})*	Food dabblers (\bar{x})	Food appreciators (\bar{x})	Pro-sus (\bar{x})	Pressured (\bar{x})
Segmentation variables	Quality attributes (\bar{x})	-0.332 ^{b**}	0.691 ^a	-0.001 ^b	-0.509 ^b
	Food responsibility (\bar{x})	-1.174 ^c	0.328 ^b	0.650 ^a	0.807 ^a
	Dietary choices (\bar{x})	0.109 ^b	-0.752 ^d	1.164 ^a	-0.292 ^c
Quality attributes	Organisation (\bar{x})	-0.086 ^b	0.276 ^b	0.740 ^a	-1.098 ^d
	Local (\bar{x})	1.115 ^c	3.575 ^a	2.515 ^b	0.550 ^c
	Domestic COO (\bar{x})	0.490 ^c	3.149 ^a	1.864 ^b	-0.250 ^c
	Price quality (\bar{x})	0.327 ^b	2.294 ^a	0.985 ^b	0.967 ^b
	Seasonality (\bar{x})	0.587 ^b	3.600 ^a	2.89 ^a	1.367 ^b
Responsibility	Fair price for producer (\bar{x})	0.298 ^b	2.032 ^a	2.364 ^a	-0.350 ^b
	HH provisioning responsibility (\bar{x})	0.539 ^b	4.777 ^a	5.242 ^a	4.900 ^b ^a
	HH preparation responsibility (\bar{x})	0.077 ^b	4.309 ^a	4.970 ^a	4.633 ^a
Dietary choices	Reducing meat (\bar{x})	0.173 ^b	-2.468 ^c	3.333 ^a	-1.917 ^c
	Increasing vegetarian (\bar{x})	-0.606 ^b	-2.457 ^c	3.273 ^a	-1.700 ^b ^c
Organisation	Minimise creating waste (\bar{x})	-0.125 ^c	0.968 ^b	3.000 ^a	-1.850 ^d
	Managing leftovers (\bar{x})	0.914 ^c	3.681 ^b	4.697 ^a	0.0867 ^c
	Organised purchasing (\bar{x})	0.539 ^b	1.575 ^a	2.152 ^a	-1.017 ^c

Note(s): * Mean Score range from 6 to 6. A higher score means that the segments displays more of the characteristic

**The superscripts “a-d” indicates significant mean differences between segments at the 95% confidence interval ($p < 0.05$) based on ANOVA test with Post hoc Bonferroni. Superscript letters should be read by row. If letters differ between two segments the mean scores are significantly different. For example, in the case of quality attributes, ‘food appreciators’ mean score is significantly higher than the other three segments, as indicated with the “a” superscript, the remaining three segments means scores are not significantly different from each other as indicated with common “b” superscript annotation. In each row the green shaded cells highlight the segment with the highest mean score on the item and the yellow indicates the lowest mean score

Source(s): Authors work

Table 4.
Detailed segment profiles based on food provisioning statements

		Food dabblers N(%)	Food appreciators N(%)	Pro-sus N(%)	Pressured N(%)	Total N(%)	Chi-square df sig
Intention to take food behaviour related actions to become more sustainable	No intention to take action within the next 6 months	24(23)	11(12)	7(11)	16(27)	58(18)	45.11 (df 15) <0.001
	I intend to take action within the next six months	21(20)	16(17)	10(15)	17(28)	64(20)	
	I intend to take action within the next 30 days and have taken some behaviour steps in this direction	22(21)	7(7)	6(9)	3(5)	38(12)	
	I have changed my behaviour within the last six months	25(24)	25(27)	18(27)	15(25)	83(26)	
	I have changed my behaviour for more than six months	7(7)	26(28)	16(24)	6(10)	55(17)	
	I have adopted sustainable practices and I am 100% confident that I will not relapse	5(5)	9(10)	9(14)	3(5)	26(8)	
Total		104(100)	94(100)	66(100)	60(100)	324 (100)	

Source(s): Authors work

Table 5.
Food behaviour change
intentions due to
sustainability concerns

decision makers in their households. In comparison, *Food Appreciators* and the *Pressured* are more likely to engage in sustainable dietary choices (*p-value* <0.001). They were more likely to reduce their meat consumption [1] than both of these segments (*p-value* <0.001) and more likely to eat vegetarian meals frequently compared to *Food Appreciators* (*p-value* <0.001). Additionally, they were more organised in their food behaviours than the *Pressured* and less organised than the other two segments (*p-value* <0.001). While their ability to manage leftovers is similar to the *Pressured* (*p-value* >0.05), they are less likely to create waste and be disorganised in their shopping than this segment (*p-value* 0.001). Their outlook on quality attributes is generally similar to that of the *Pressured* and *Pro-Sus*. On closer inspection, they place less importance on all quality attributes (local, domestic country of origin (COO), seasonality and fair price for producers) except one (price-quality) than on the *Pro-Sus* (*p-value* <0.001). Their attitudes towards the range of quality attributes examined were not significantly different from those of the *Pressured*.

Considering intention to change due to sustainability concerns (Table 5), compared to the other three segments (5–9%), the *Food Dabblers* had the highest proportion (21%) who intended to take food-related sustainability actions within the next 30 days and have taken behavioural steps in this direction. However, only 12% of *Food Dabblers* changed their behaviour over the preceding six months, compared to 38% for both *Pro-Sus* and *Food Appreciators*. In this respect, the *Pressured* segment is similar to the *Food Dabblers*’ with only 15% changing their behaviour in this six-month period.

	Food dabblers N(%)	Food appreciators N(%)	Pro-sus N(%)	Pressured N(%)	Total N(%)	Chi square Sig
Meat and meat products	Every week	25(24)	33(35)	18(27)	22(37)	33.156 df 12
	2 to 3 times a month	26(25)	11(18)	11(17)	12(20)	<0.0001
	2 to 3 times per 3 months	21(20)	11(12)	4(6)	8(13)	
	Once or less per 3 months	12(12)	16(17)	7(11)	14(23)	
	Never	20(19)	17(18)	26(39)	4(7)	
Total	104(100)	94(100)	66(100)	60(100)	324(100)	
Fish and seafood	Every week	16(15)	23(25)	11(17)	11(18)	22.15 df 12 0.036
	2 to 3 times a month	28(27)	12(13)	12(18)	17(28)	
	2 to 3 times per 3 months	20(19)	7(7)	8(12)	4(7)	
	Once or less per 3 months	14(14)	16(17)	9(14)	12(20)	
	Never	26(25)	36(38)	26(39)	16(27)	
Total	104(100)	94(100)	66(100)	60(100)	324(100)	
Oils	Every week	19(18)	5(6)	7(11)	1(2)	30.77 df 12
	2 to 3 times a month	22(21)	16(17)	10(15)	10(17)	0.002
	2 to 3 times per 3 months	23(22)	17(18)	12(18)	22(37)	
	Once or less per 3 months	20(19)	37(39)	27(41)	18(30)	
	Never	20(19)	19(20)	10(15)	9(15)	
Total	104(100)	94(100)	66(100)	60(100)	324(100)	
Dietary and special requirements	Every week	14(14)	6(6)	10(15)	5(8)	26.41 df 12
	2 to 3 times a month	21(20)	10(11)	7(11)	7(12)	0.013
	2 to 3 times per 3 months	21(20)	9(10)	9(14)	5(8)	
	Once or less per 3 months	17(16)	13(14)	11(17)	9(15)	
	Never	31(30)	56(60)	29(44)	34(57)	
Total	104(100)	94(100)	66(100)	60(100)	324(100)	

Note(s): *Each subscript letter denotes a sub-set of cluster number of case categories whose column proportions do not differ significantly from each other at the 0.05 level

Source(s): Authors work

Table 6.
Segment online food
purchase frequency
profile

		Food dabblers N(%)	Food appreciators N(%)	Pro-sus N(%)	Pressured N(%)	Total N(%)	Chi square df sig
Number of adults in HH	1	10 (10)	25 (27)	15 (23)	12 (20)	62 (19)	12.730 df 6 0.048
	2	54 (52)	48 (51)	33 (50)	29 (48)	164(51)	
	3	40 (38)	21 (22)	18 (27)	19 (32)	98(30)	
Gender	Total	104(100)	94(100)	66 (100)	60(100)	324(100)	25.906 df 3 <0.001
	Female	55(53)	39(41)	49 (74)	45(75)	188(58)	
	Male	49 (47)	55(59)	17(26)	15 (25)	136(42)	
	Total	104 (100)	94(100)	66(100)	60(100)	324(100)	
Age	18–29	30(29)	11(12)	12(18)	10 (17)	63(19)	35.114 df 9 <0.001
	30–44	49(47)	34(36)	30(46)	24(40)	137(42)	
	45–59	21(20)	22(23)	19(29)	16(27)	78(24)	
	>60	4 (4)	27(29)	5(8)	10 (17)	46(14)	
Employment	Total	104(100)	94(100)	66(100)	60(100)	324(100)	17.201 df 9 0.046
	Full-time	63(61)	54(57)	34(52)	31(52)	182(56)	
	Part-time	20(19)	9(10)	14(21)	7(12)	50(15)	
	Unemployed	9(9)	4(4)	4(6)	3(5)	20(6)	
	Student/ homemaker/ retired	12(12)	27(29)	14(21)	19(32)	72(22)	
Social classification total	Total	104(100)	94(100)	66(100)	60(100)	324(100)	37.192 df 12 <0.001
	Upper middle and upper	28(36)	5(5)	8(12)	9(15)	50(15)	
	Middle	56(54)	57(61)	36(55)	35(58)	184(57)	
	Lower Middle	16(15)	30(32)	14(21)	12(20)	72(22)	
	Lower	4(4)	2(2)	8(12)	4(7)	18(6)	
Total	104(100)	94(100)	66(100)	60(100)	324(100)		

Table 7. Segment demographic profile

Note(s): *Each subscript letter denotes a sub-set of cluster number of case categories whose column proportions do not differ significantly from each other at the 0.05 level
Source(s): Authors work

Their online purchase frequency for specific food categories also differentiates them from the other segments (Table 6). They were more likely (75%) than the *Pro-Sus* (61%) to purchase fish and seafood online; additionally, their purchase of oils was noteworthy, with 18% indicating that they buy this product weekly, compared to 2% for the *Pressured*. Interestingly, they are also more likely (p -value <0.05) to be online purchasers of products that meet special dietary needs (70%) than *Food Appreciators* (40%) and the *Pressured* (43%).

A higher proportion of this segment (36%) identified themselves as upper or upper middle class compared to the other segments, *Food Appreciators* (5%), *Pro-Sus* (12%) and *Pressured* (15%) (Table 7). *Food Dabblers* are more likely to be composed of a younger cohort than other segments. Indeed, almost 30% of this segment is aged 18–29 which compares to 12% for *Food Appreciators*. Compared to the other segments, they were more likely to live in households with three adults ($p = 0.048$). Indeed, 38% of this segment lived in 3+ adult households in comparison to 22%, 27%, and 32% for *Food Appreciators*, *Pro-Sus* and *Pressured* respectively. They are more likely to be in some form of employment (full-time or part-time), with 80% falling into one of these categories compared to 64% of the *Pressured*.

Segment 2 food appreciators (n = 94; 29%)

The “*Food Appreciators*” are different from the other segments given their focus on quality attributes that have been associated with sustainability ($p < 0.001$). In comparison to the other

three segments they appear to have a stronger interest in food placing greater emphasis on quality over price ($\bar{x} = 2.30$; $p < 0.001$) and prefer/are more interested in local ($\bar{x} = 3.58$; $p < 0.001$) and domestic foods ($\bar{x} = 3.15$; $p < 0.001$). This suggests that provenance appears to play a notable role in their food choice processes, and this differentiates them from other segments. With regard to organisation, they are second only to the *Pro-Sus in the management of leftovers* ($\bar{x} = 3.68$), and trying not to be overly disorganised in their purchases ($\bar{x} = 1.58$) (Table 4). The importance of a fair price for producers and in-season purchases is similar for these and the *Pro-Sus* (p -value < 0.05) and means more to them compared to the other two segments. They are the second most organised segment, with the *Pro-Sus* paying more attention to waste minimisation and managing leftovers. Their commitment to a meat diet was evident in that they were the least likely to eat vegetarian meals ($\bar{x} = -2.58$) or meals without meat ($\bar{x} = -2.47$) ($p < 0.001$).

It is interesting to note that 62% of this segment has changed their food behaviours to become more sustainable. They and the *Pro-Sus* displayed a similar behaviour change profile which was significantly different from the *Food Dabblers* and *Pressured* segments ($p < 0.001$) in that they embedded some food-related sustainable actions in their everyday lives (Table 5).

There are a few notable differences between online food purchase behaviour and the sample average (Table 6). They have the highest proportion of individuals who never buy dietary and special requirement foods at 60%, which is comparable to the sample average of 46% (p -value < 0.05). Additionally, they were significantly more likely to never purchase fish online (44%) than *Food Dabblers* (25%) and *Pressured* (27%) ($p < 0.05$).

Food Appreciators were more likely to include those aged > 60 years ($p < 0.001$) (Table 7). Indeed, 29% of this segment were 60 plus compared to 14% for the sample average and 4% for *Food Dabblers*. They were the least likely of all segments to live in a household with three or more adults ($p = 0.048$) and were significantly more likely to be male compared to the other segments at 59% compared to a sample average of 42%.

Segment 3: *pro-sus* ($n = 66$, 24%)

The “*Pro-Sus*” appear to be the sustainability early adopters amongst our food consumers. They are very much engaged with sustainability initiatives with their high mean scores for dietary change (reducing meat $\bar{x} = 3.33$; increasing vegetarian $\bar{x} = 3.27$) and organisation (minimise creating waste $\bar{x} = 3.00$; increasing vegetarian $\bar{x} = 4.7$) (Table 4). They were more likely to try to avoid meat-based meals and eat vegetarian meals than the other three segments ($p < 0.001$). Their organisation patterns also differ in that they are more likely to minimise waste ($p < 0.001$) and manage leftovers ($p \leq 0.047$) than the other segments and are more likely to engage in organised in their purchases than *Food Dabblers* and *Pressured* segments ($p < 0.001$). Additionally, while placing less emphasis on quality attributes than *Food Appreciators* they are more interested in these than the other two segments. This segment displays a strong disposition towards a range of activities and preferences associated with a more sustainable food system.

This segment displays a similar pattern of responses to food-related sustainability behavioural intentions (Table 5) as the *Food Appreciators* with 38% of this segment indicating that they have already embedded some food-related sustainable actions in their everyday lives for more than six months and a further 27% having changed their behaviours within the last six months. Unsurprisingly, only 11% of this segment suggested that they had no intention of taking sustainable action within the next six months. This was compared with 18% for the total sample and 27% for the *Pressured* ($p < 0.001$).

This segment's online food purchase behaviour reflects their tendency to avoid meat-based meals, as 39% never purchase meat or fish and seafood fish on such platforms (Table 6). Meat purchase behaviour is particularly noteworthy when compared to the other segments, where 7–19% of these segments never buy meat online (p -value < 0.001).

While *Pro-Sus* spanned across the age categories, they were more likely to be female (75%) than male, compared to 53 and 41% for the *Food Dabblers* and *Food Appreciators*, respectively (Table 7). Additionally, compared to the other segments, there is a disproportionate number of *Pro-Sus* in the part-time employment category at 21%. This is compared to 10 and 12% for *Food Appreciators* and *Pressured*.

Segment 4: pressured (n = 60, 19%)

The “*Pressured*” maintain the least sustainable household food practices amongst our food consumers. They are not focused on sustainability, as evident in their lack of interest in avoiding waste ($\bar{x} = -1.85$), and attention to the management of leftovers ($\bar{x} = 0.87$) (Table 4). While responsible for household food provisioning, of the 4 segments they are the least organised in their purchases ($\bar{x} = -1.02, p < 0.001$). They are more likely to create waste and make unplanned food purchases ($p < 0.001$) than the other segments. Their management of leftovers was similar to *Food Dabblers* ($p > 0.05$) and significantly poorer than that of the other two segments ($p < 0.001$). They were among the least concerned with quality attributes, displaying a similar pattern to the *Food Dabblers’* segment ($p > 0.05$). Their dietary choices differ significantly from those of the *Pro-Sus* and fall between the *Food Dabblers* and *Food Appreciators*. Their position on avoiding red-meat-based meals was similar to that of the *Food Appreciators* ($p > 0.05$). This position on meat is further evidenced when one examines online meat purchases by just 7%, indicating that they never buy from this category (Table 6). This is comparable to the 39% for *Pro-Sus*. In contrast, in keeping with their profile, 57% never bought dietary and special requirements. This is compared to 30% for the *Food Dabblers’* segment.

Interestingly, over a quarter of this segment (27%) suggested that they had no intention to change their food behaviours for sustainability reasons within the next six months (Table 5). This was 11 and 12% for *Pro-Sus* and *Food Appreciators*, respectively ($p < 0.001$). An additional 28% of this segment indicated that they intended to take action within the next six months. This suggests that the level of procrastination was not as evident in the other segments ($p = 0.001$). This female (75%) dominated segment displayed no other notable demographic characteristic differences from the sample population (Table 7).

Discussion

The aim of this study was to identify online consumer segments based on key food consumption practices, from purchasing to disposal, with a view to providing a holistic view of the range of sustainable behaviours practiced by food consumers. The consumer segments emerging from the findings are *Food Dabblers*, *Food Appreciators*, *Pro-Sus* and *Pressured*. Quality attributes, food responsibility, dietary choices and levels of food organisation and management are embedded in a complex mix of sustainability-related food behaviours practiced by the different consumer segments. Therefore, these segments present a picture of food consumers relating to not only their food purchase behaviours but also their interests, preferences and habitual behaviours in the home.

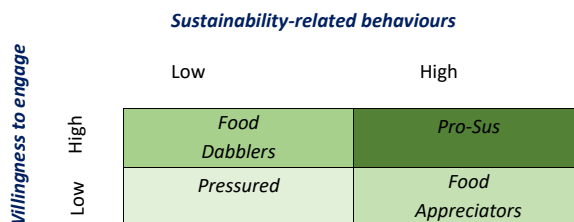
The mix of sustainable behaviours actioned in each segment may shed light on a broader willingness to engage in environmentally friendly practices beyond food-related behaviour. Considering the stated food behaviour change intentions due to sustainability concerns for the four segments along with their current behaviours in terms of quality attributes, level of food responsibility in the home, dietary choices and preferences, and levels of food organisation and waste management offers insight into overall dispositions towards engaging with sustainability. The quadrants in Figure 3 indicate willingness to engage (high or low) with sustainability-related behaviours (high or low).

From **Figure 3**, we can see that where *Food Dabblers* do not necessarily display behaviours consistent with pro-sustainability, their willingness to engage is high and therefore presents an opportunity to encourage more active purchasing and behaviour change towards sustainability. *Pressured* individuals display low sustainability-related behaviours along with an overall low willingness to engage, although there is some potential to draw on their good intentions so long as they fit within their pressured lifestyle. *Pro-Sus* consumers score high in both willingness and behaviour, making them the most engaged with sustainability, while the *Food Appreciators* display a good degree of sustainable behaviours; they may be unwilling to change certain aspects of their consumption, for example, their meat consumption.

The findings presented in this paper offer four distinct segments with different approaches to sustainable food consumption, integrating elements of quality attributes sought (e.g. local, seasonal, origin), level of food responsibility in the home (e.g. food preparation), dietary choices and preferences (e.g. meat avoidance, vegetarian), and levels of food organisation and waste management (e.g. best-before dates, using leftovers, food waste).

Food Dabblers are most distinguished from the other segments by their lower levels of responsibility for food and meal provisioning and are more likely to comprise of younger consumers than other segments. While not taking primary charge for food provisioning, relative to some of the other segments, they have a greater disposition towards some sustainable food behaviours. In comparison to *Food Appreciators* and the *Pressured* they are more likely to engage in sustainable dietary choices and are more likely to reduce their meat than both of these segments. Interestingly, the *Food Dabblers* had the highest proportion (20%) of consumers who intend to take food-related sustainability actions within the next 30 days, but they are the least likely to have changed their behaviours for at least six months, suggesting that this young cohort is indeed aspirational about sustainability-related behaviours – their widely reported eco-sensitivity (PwC, 2021) appears to be either overrated or, more promisingly, not yet reaching the point where they have the capacity and/or need to action out their preferences, that is, this segment may be pro-active once they leave the family home and become responsible for their own food choices. However, based on their attention to eating less meat and more vegetarian meals, thus engaging in consumption curtailment strategies (Verain et al., 2015), the low percentage indicating that they have taken food related actions to become more sustainable may infer that, for now, they tend to follow certain trends and are less concerned about the environment.

Food Appreciators displayed a strong interest in quality-related food choice attributes, which distinguishes them from other segments. This segment has a strong interest in food, valuing quality over price via their preferences for origin, seasonality and fair trade. Given their appreciation for their food, particularly local food, this segment is more likely to be older males, manage their waste very well and not shop on impulse. Being second only to the most sustainable group in terms of waste minimisation and managing leftovers, *Food Appreciators* however, do not compromise meat consumption. They were the least likely group to go



Source(s): Authors work

Figure 3. Disposition towards engaging with overall sustainability

without meat or eat vegetarians. These meat eaters, however, do not disregard their responsibilities when it comes to food sustainability and are, in fact, performing favourably both in terms of purchase-related behaviours (e.g. local) and habitual behaviours (e.g. using leftovers).

Notable in the character of *Food Appreciators* is their careful selection and use of resources and their general avoidance of waste. This segment displays personal norms around frugality, which ties with a quality consciousness that minimises impulsive purchases (through organised purchasing) and consumption. The attention given to enjoyable eating experiences by this segment reflects their interest in good food, where values are attained through careful curated choices which emphasises a preference for quality over quantity. A willingness to spend more per unit combined with a minimisation of waste appears as their *modus operandi* and ties with concepts associated with frugality (Bouckaert *et al.*, 2008; Farrell, 2010). Frugality is also relevant to *Food Dabblers* given their younger profile. Naderi and van Steenburg (2018) highlight frugality, along with future orientation, as a significant determinant of sustainable behaviour among millennials. In this context, connecting positive emotions, possibly through peer influence, to concepts of frugality and reinforcing these through social approval could offer a useful avenue to prompt greater responsibility for all aspects of food in everyday life and more sustainable behaviours. This type of action could be further supported by drawing attention to both immediate and long-term benefits for the self and environment. Frugality in this group may be due to limited resources, time and money.

The *Pro-Sus* segment displayed a tendency to engage in a range of practices linked to positive sustainability outcomes and thus represents the most sustainability-focused segment of the four. Indeed they appear to be at the forefront of behavioural change as they embrace many of the suggested food actions that support a more sustainable diet. This segment is the most notable for meat and vegetarian meal preferences. Their dietary choices and organisation of food activities suggest that they are taking personal responsibility in response to sustainability-related concerns such as carbon emissions, climate change and biodiversity loss (Luchs *et al.*, 2015). This segment, more likely to be female, avoids meat-based meals in favour of vegetarian meals, more so than the other three segments and equally minimises waste and manages their food leftovers. These early adopters embrace a variety of positive purchase-related and habitual behaviours, with indications that many have already changed many of their behaviours to be more sustainable.

Finally, the *Pressured* segment, who are responsible for household food provisioning, are not interested in food-related sustainability practices. This segment does not display sustainable behaviours but rather appears to be time-poor and prioritises getting food on the table. They are likely to be female, employed outside the home and have full responsibility for food provisioning but lack any obvious interest in the food they provide beyond meeting functional needs. This group are disorganised in their purchasing behaviour and tend to lack in the area of managing leftovers and food waste. Although not concerned with quality attributes, they are similar to *Food Appreciators* in terms of their preference for meat. Interestingly, in this segment, almost a third suggested intentions to change their food behaviours towards sustainability in the next six months. This suggests that they are aware of the unsustainable aspects of their consumption, but have not yet managed to change their daily consumption purchases/habits. These are an important group to recognise in addressing the sustainability of the food system, as they appear open to change but procrastinate due to other lifestyle demands. Given the competing demands on time and energy experienced, attention could be given to creating conditions conducive to their engagement in more sustainable food behaviours. Innovations in how food producers and retailers engage with and deliver food to this group could help mitigate barriers to sustainable practices; these could involve innovative packaging and more malleable ordering

delivery services. Such developments would evolve with consumer needs, offering a service that responds to ebbs and flows of food consumption patterns within the household. As this segment already engages in online shopping services, the utilisation of a range of digital technologies could support more personalised shopper experiences that aim to fit within the household's food lives while supporting sustainable food practices.

Triggering and reinforcing emotional connections with sustainable food practices and attributes warrants consideration. Ila and Sanjaya (2019) highlight the potential role of gratitude, pride and happiness in embedding sustainable practices. They suggest that it is important to “capitalise” on positive feelings triggered through the individual's engagement with these sustainable behaviours. Through the leveraging of emotion, specific sustainable practices could become more meaningful to groups, such as *Food Dabblers* and *Pressured* groups. For the latter, this may relate to next-generation security and quality of life with communications that trigger emotions such as guilt to initiate a behaviour and expression of gratitude that triggers pride and happiness to reinforce these. For the former, the emotions of joy and pride could be triggered by conveying what they can do with this, reinforced by confirming that these actions meet social/peer approval.

Conclusion

Food consumption and related behaviours is complex (Verain *et al.*, 2012). Research has tended to focus on point-of-purchase settings (Carrero *et al.*, 2016; Su *et al.*, 2019) or habitual and routine behaviours (Chen, 2023; Gilg *et al.*, 2005) but less attention has been paid to understanding sustainable food behaviours at various stages of the consumption process. Based on literature and prior research, sustainability-related food behaviours in this study referred to quality attributes (e.g., purchasing local food), food responsibility (e.g., using a shopping list), dietary choices (e.g., adopting vegetarianism), and food organisation and management within the home (e.g., avoiding food waste). This study offers insight into the sustainability-related food behaviours of four consumer segments – *Food Dabblers*, *Food Appreciators*, *Pro-Sus* and *Pressured*. This holistic view of the range of sustainable behaviours practiced by food consumers offers insight into the transition to “green recovery” in our post-pandemic world (Giudice *et al.*, 2020) and the mix of sustainable behaviours actioned in each segment may shed light on a broader willingness to engage in environmentally friendly practices beyond food-related behaviour.

Note

1. Table 2 presents the base statements used in the creation of indicators and forms the basis for reporting on each of the segments. Table 4 present the significant difference associated with these indicators.

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