

Online Food Shoppers: An exploration of the relationship between frequency of use and sustainable household food practices.

Summary Report

Researchers

Professor Mary McCarthy, Management and Marketing, Cork University Business School

Dr Claire O'Neill, Management and Marketing, Cork University Business School

Dr Seamus O'Reilly, Food Business and Development, Cork University Business School

Professor Frode Alfnes, School of Economics and Business, Norwegian University of Life Sciences

SUSFOOD2: ERA-NET

Funding scheme: PLATEFORMS – H2020 EU project – [2018 – 2021]

Department of Agriculture, Food and Marine (DAFM)

1. Background

Significant attention has been given to food in debates emerging around the mechanisms necessary to address sustainability challenges. Indeed, polarised perspectives among experts and various stakeholders are evident due to the complex dynamics between the environment, equity and the economy that characterise sustainability. However, this debate and the broader sustainability narrative has led to a general awareness of the role of food in resolving current sustainability challenges and rising consumer demand for sustainable foods and sustainable businesses. Many consumers are looking to producers and manufacturers to make food systems more sustainable while also adjusting their own behaviours. It is within this context that we consider where consumers acquire their foods and how this connects with household sustainable practices.

Consumer demands for convenience, high quality, sustainable and healthy foods has prompted many retailers to respond by altering their operational and marketing strategies. Among these responses is the emergence of new routes to reach target markets, with a wide range of food provisioning services (e.g. artisan shops, farmers markets, online services) now available which offer consumers greater opportunities to satisfy their specific food needs. One route that major retail multiples, independent local stores (artisanal shops, health food stores) and Alternative Food Networks alike are developing is the online grocery food provisioning service. This can offer several advantages, such as ability to compare prices and product offerings, access to specialised regional and international foods, information provision, time saving and reducing the physical effort of shopping (Alaimo, Fiore M. and Galati, 2020). While still in its infancy, demand for this service has grown considerably in the last three years. Indeed prior to Covid-19 it was anticipated that online share of the grocery trade would reach 5% by 2022 (Berry 2018) but it is likely to have gained more share than this when one examines the more recent consumer uptake. In 2017 approximately 13% of Irish adults were ordering at least some of their groceries online (Bord Bia Periscope, 2017) however in the three intervening years, between 2017 and 2020, online grocery shopping has grown by 75% and it is forecasted to grow by a further 55% in the next three-year period (Bord Bia, 2020).

Gilge et al (2005) suggested that moving towards being more sustainable must be seen as a shift towards new lifestyles, incorporating cross cutting purchase-related and habitual elements. This may include what we consume, how we consume this and how we ultimately dispose what is not consumed. Use of online grocery food provisioning services could potentially enable users to become more sustainable in their everyday practices through greater access to food with strong sustainability credentials and better food planning and management. Fuentes (2014) notes that one of the

mechanisms used by those attempting to behave more sustainability was to they avoid buying too much. While this related to outdoor products, a similar type of approach could be taken for food, buy only what is needed (rather than what might be needed or what 'offers good value for money') and thus avoiding waste. This could be accommodated by on-line buying through the greater ability to avoid impulsive purchasing. However, according to Heidenstrøm N. and Hebrok (2021) online grocery shopping is to a larger extent mirroring in-store shopping, thus the benefits of this route to the household may not be witnessed.

Additionally, reasons cited for not consuming more ethically produced foods include, having to pay more, expending more time and effort to identify ethical products, or having to sacrifice on enjoyment (Eckhardt et al., 2010).

Considering the recent growth in these online services, it is interesting to profile users to establish if level of use links with a broader desire be sustainable within the household. Thus, the findings presented here addresses a simple question: Do those that spend more on online food provisioning services for food groceries¹ display a greater disposition towards sustainable food practices in the household?

2. Methods

Data were collected through an online survey in December 2020 and included questions addressing online food purchase behaviour, purchasing patterns, and food interest, preferences and behaviours that are linked to food sustainability. In keeping with other similar surveys, quotas were set to ensure a balanced sample on gender, age, education, and degree of urbanisation (see table 1 for demographic profile). Forty-three respondents from the valid sample of 324 were excluded as they were very infrequent users of online food supply services. Thus, 281 respondents were included for analysis.

¹ In this study food groceries are defined as all food products usually available in a grocery store. This excludes food bought in restaurants, takeaways/home delivery (from food service outlets) and foods bought and consumed outside of the home. It also excludes non-food items purchased in the grocery store.

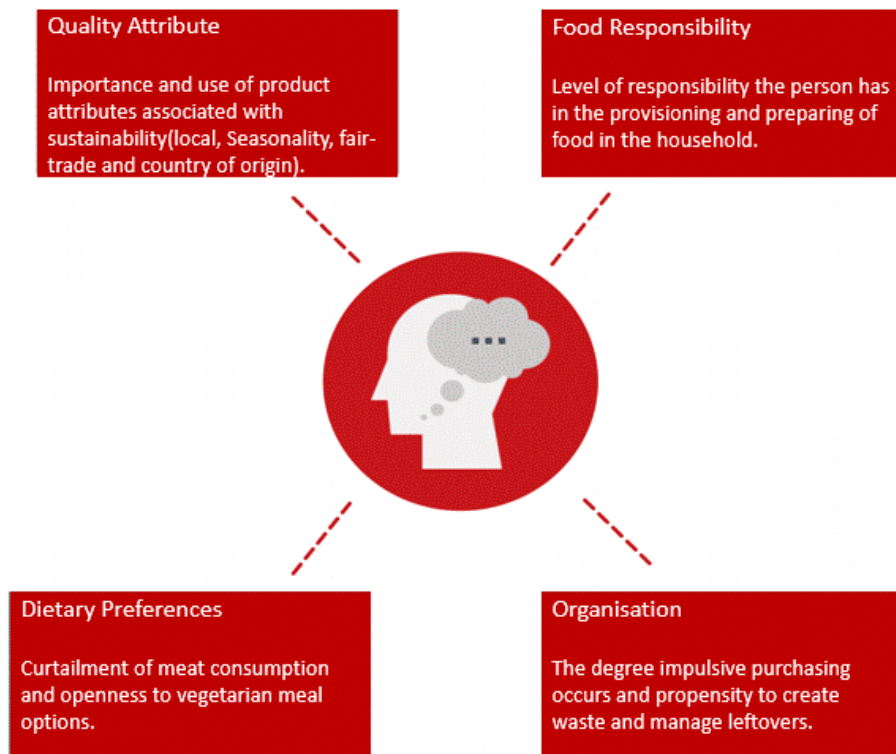
Table 1: Socio Demographic Sample Profile

	Level	N	%		Variable	Level	N	%
Age	18-29	54	19		Number of adults in household	1.00	54	19
	30-44	125	45			2.00	144	51
	45-60	65	23			3+	83	30
	> 60	37	13			Total	281	100
	Total	281	100					
Number of dependent children	0	161	57		Highest education level achieved	Primary	7	2.5
	1	53	19			Secondary	50	18
	2	44	16			Post- Secondary	60	21
	3+	23	8			University level	164	58
	Total	281	100			Total	281	100
Occupation status	Full-time paid ¹	166	59		Self-identified Social Class	Upper/Upper middle	49	17
	Part-time paid ²	43	15			Middle class	156	56
	Unemployed	16	6			Lower middle class	63	22
	Other ³	56	20			Lower class	13	5
	Total	281	100			Total	281	100
Gender	Female	159	57		¹ more than 30 hours work per week			
	Male	122	43		² between 15 and 29 hours work per week			
	Total	281	100		³ others include student, homemaker, retired, etc.			

Measures

Frequencies of online purchases for 14 food categories were measured. Additionally, indicators of 16 food sustainability characteristics across four general elements of practices were included. The elements of interest were: Organization and planning; Product choice attitudes and purchase; Dietary choice (e.g., curtailment); and Surplus, leftovers, and waste management. More details on each element are contained in Figure 1. For each of the 16 characteristics, one positive and one negative statement was included, thus a total of 32 statements were analysed. These statements relate to different aspects of the practice (interests, preferences, or actions), consequently the measures were not, by necessity, expected to be highly correlated.

Figure 1: Sustainability Elements



Two measures of ‘being more sustainable’ were also included. The first related to intention to change food behaviours for sustainability and the second included five statements on willingness to take actions to be more sustainable in everyday lives. Respondents were also asked to indicate when they commenced shopping for groceries online and their spend over the previous 3 months. Spend levels were used to classify respondents for further analysis.

3. Findings

Purchase behavior, Spend and Purchase Location

The majority (52%) commenced online grocery food shopping in 2020, 39% had done so between 2015 and 2019 and the remaining 9% had commenced prior to 2015. Just under a third of respondents were classified as ‘low spenders’, having spent less than €100 in the previous three months on online food purchases, ‘moderate spenders’ accounted for 40% of the sample, spending between €100 and €499 and the remaining 28%, while ‘high-spenders’ had spending €500 or more in the 3-month period.

This suggests that there is significant variety in the proportion of food grocery spend that is directed towards online food provision services. No significant relationship was noted between commencement of food grocery shopping online and 'spender' segment. Interestingly respondent's share of grocery spend directed to online food purchases increased since the emergence of the Covid-19 pandemic. An 11 point-scale for share of food grocery shopping done online, where 0 denoted none and 10 denoted all, was used. A pre-Covid-19 mean score of 3.07 (SD 2.81) suggests that online grocery shopping was not the dominant source of groceries for most using this service however the mean score increased to 5.97(SD 2.66) following the introduction of Covid-19 related restrictions. This might suggest an increased reliance of online services emerging from the change in the external environment. However while an increase in online grocery purchases is evident from this survey of users, the survey did not gather information about potential leavers.

Table 2: Online shopping behaviours

Spend in last three months			Main Online Service Provider used	
Spend	Segment Label	N(%)	Service Provider	N(%)
Less than €100	Low spenders	86(30)	Alternative and Other	31(11)
€100-€499	Moderate spenders	117(42)	Aldi/Dunnes/Lidl	51(18)
€500 plus	High spenders	78(28)	SuperValu	45(16)
Total		281(100)	Tesco	154(55)
			Total	281(100)
Share of grocery shop spend online ⁱ				
Segment	Pre-Covid $\bar{X}$ (SD)	ANOVA	Covid restrictions onwards $\bar{X}$ (SD)	
Low Spender	2.98 (2.80)	P = 0.344	4.62 (2.26)	P ≤ 0.001
Middle Spender	2.88 (2.49)		5.79 (2.60)	
High Spender	3.46(3.25)		7.74 (3.25)	
Total	3.07(2.81)		5.97 (2.66)	
ⁱ 11 point scale from 0 none to 10 all				

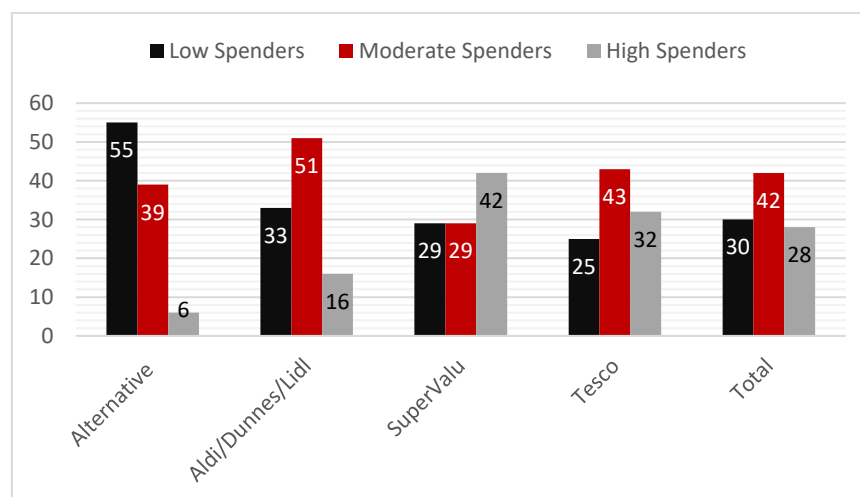
ⁱ 11point scale from 0 none to 10 all

While there were no significant differences ($p = 0.344$) in online share of grocery spend prior to Covid-19 across the segment's this changed following the introduction of Covid-19 restrictions (Table 2). High spenders online share of grocery food spend was significantly greater ($p < 0.001$) than the other two segments, as were the moderate spenders relative to the low spenders ($p = 0.002$). Finally, respondents were asked to indicate their future likely online food grocery shopping behaviour, 36% suggested that they will increase the share of food grocery shopping done online while 43% and 21% indicated that it will remain as is or decline respectively. A significant (Chi-Square = 22.38; DF=4; $p < .001$) moderate association (Cramér's $V = 0.2$) between commencement of food grocery shopping

online and future online grocery online shopping intentions was noted. Thirty two percent of those who commenced using these services post Covid-2019 intended to decrease their reliance on them in the future this compared to 10% for those who commenced between 2015-2019 and 8% for those who commenced prior to 2015 (8%). Of the remaining 68% who had commenced using these services post 2019, 34% intended to continue using the service at the same level and 34% intended to increase their use.

Chi-squared analysis highlighted some significant demographic differences across the ‘spender’ segments. Households with 2 adults and households with 2 or more children were more likely to be in the high spender category, while low spenders were more likely to be one-adult households and/or households with no children ($p < 0.001$). Occupation, social status, and dwelling location (urban/rural) did not differ across the three segments.

Figure 2: Average 3 month spend by Food Supply Service Provider (%)



An analysis of the main online service providers (Figure 2) highlighted that those spending more online were more likely to shop from the established mainstream retail stores (i.e., SuperValu and Tesco). Interestingly, Tesco has a mix of ‘moderate’ and high spenders while SuperValu had the largest percentage of high spenders. The customers of mainstream retailers who had recently launched (at the time of the survey) their online services (Aldi, Lidl, and Dunne Stores) were more likely to spend moderately. This is unsurprising as customers of these outlets transition to online grocery shopping. A majority of those using ‘non-mainstream’ retailers (55%) as their main service were low spenders.

Foods Purchased Online

As evident from Table 3 fresh food products are purchased with most regularity online, however the frequency of purchase differed across the three segments (figures 3a and 3b). For example, in the case of dairy 83% of high spenders buy these at least every second week, this drops to 29% for low spenders. At the other end of the spectrum only 2.5% of high spenders are not purchasing dairy products online which compares to 33% for low spenders. This pattern was evident across all fresh food categories with significant relationships between frequency of purchase and level of spend; in all cases high spenders were significantly more likely to be regular purchasers when compared to the other two segments.

Treat products are also frequently purchased, with 50% of respondents doing so at least every second week. This rises to 78% for high spenders and drops to 25% for low spenders. Shelf-stable groceries were in the basket of many online shoppers but a majority of those that did purchase from these categories did so once a month or less often. Again, the patterns of purchase are as expected, with high spenders buying more frequently across all shelf-stable food categories.

Table 3: Frequency of online Purchases by food category

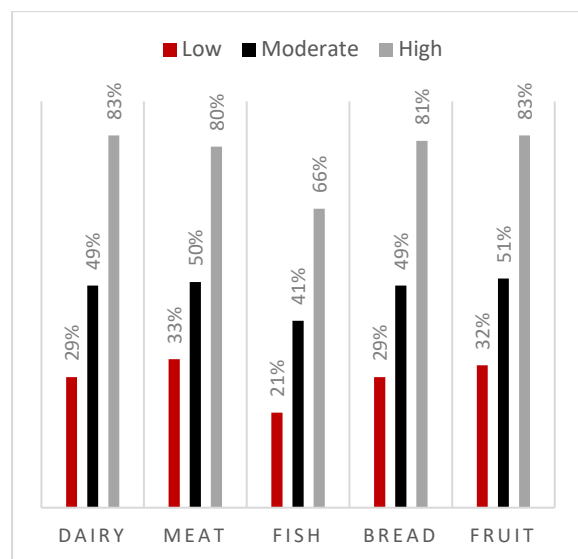
Categories	Product	Every week	Two to three times a month	Two to three times per three months	Once or less per 3 months	Never
Fresh foods	Dairy products and eggs	34	22	17	12	16
	Meat and meat products	33	22	14	14	16
	Fish and seafood	21	24	13	15	27
	Bread and bakery products	35	20	14	17	14
	Fresh fruit and vegetables	38	19	13	15	15
Treat foods	Snacks, chocolate and candies	25	25	21	19	10
Shelf stable foods	Oils	11	19	26	29	15
	Canned /bottled food products	18	23	26	21	12
	Seeds, dried fruits and pulses	12	22	25	22	19
	Pasta, rice and grains	16	28	25	18	13
Beverages	Non-alcoholic beverages	21	20	22	20	17
	Alcoholic beverages	13	21	22	19	25
	Coffee and tea	18	26	28	18	10
Special dietary	Products for special dietary needs	12	15	15	17	41

This pattern followed into the beverages categories as evident with 57% of high spenders buying alcoholic beverages at least every two weeks compared to 25% and 13% for moderate and low spenders respectively. Overall, this pattern is unsurprising when one considers that low spenders tend to shop in alternative stores, most likely, for specific food items while high spenders are, most likely, using the service to meet their weekly shopping needs.

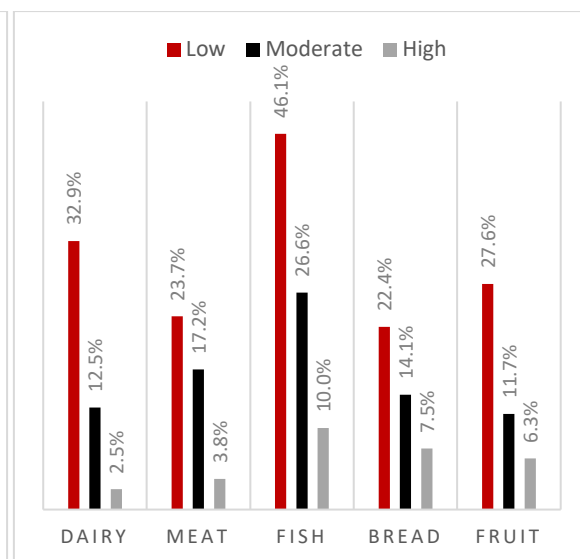
Figure 3a: Purchase behaviour fresh food: % purchasing from category at least every second week by segment

Figure 3b: Purchase behaviour fresh food: % never purchasing from category by segment.

3(a)



3(b)



Household Food Practices: Behaviours, preferences and interests

As part of this analysis the relationship between household food practices and online food spend was explored (table 4). This was of interest as it provided an insight into the extent that online food supply services formed part of a conscious consumer response to their sustainability goals. Sustainable household food practices can be broken into two broad categories, organisation and management and consumption.

Table 4: Household Food Practices: Behaviours, preferences and interests for 4 elements of practice. A comparison of mean ($\bar{x}$) scores across segments.

		Low spenders ($\bar{x}$)	Moderate Spenders ($\bar{x}$)	High Spenders ($\bar{x}$)	Total ¹ ($\bar{x}$)
Organisation and Management	I frequently buy food products I had not planned to buy	3.98	3.96	4.15	4.02NS
	I usually use a shopping list	4.78	5.03	5.00	4.95 NS
	I always throw away food that is past the best before date	3.45	3.48	3.77	3.55NS
	I sometimes eat food even if it has past the best before date	3.92	4.19	3.88	4.02NS
	I rarely eat leftover food	2.90	2.73	2.45	2.70NS
	I store and use leftover food	4.91	5.27	5.26	5.16NS
	I sometimes find food in my kitchen that has gone off	3.34	3.38	3.31	3.35NS
	I try to avoid creating food waste	5.56	5.62	5.76	5.64NS
	I often find food in my kitchen that I had forgotten about	3.35	3.18	3.09	3.21NS
	I have a good overview of the food I have at home	5.07 ^a	5.63 ^b	5.81 ^b	5.51*
	I cook most of my meals from scratch	4.97 ^a	5.20 ^{ab}	5.64 ^b	5.25**
	I frequently buy ready-made food	3.33	3.12	2.97	3.14NS
Responsibility	I am rarely involved in providing food to the household	2.64 ^a	2.11 ^b	1.94 ^b	2.22**
	I am rarely involved in the preparation of the food eaten in my household	2.78 ^a	2.24 ^b	2.13 ^b	2.37**
	I am responsible for most of the food purchases in my household	5.49 ^a	5.68 ^{ab}	6.00 ^b	5.71***
	I am responsible for most of the cooking in my household	5.30	5.56	5.28	5.40NS
Quality Attributes: Preference and behaviours	I am not very interested in the seasonality of products.	3.40 ^a	2.67 ^b	3.10 ^{ab}	3.01*
	I mainly buy fresh fruits and vegetables that are in season.	5.05	5.21	5.12	5.14 NS
	I rarely check the country of origin of the food I buy	3.47	3.35	3.64	3.47NS
	I prefer domestically produced food	4.65 ^a	5.10 ^b	5.14 ^b	4.98**
	I am not very interested in locally produced food	3.00	2.84	2.72	2.85NS
	I prefer locally produced food	4.78	4.97	4.92	4.90NS
	I rarely buy organic food	4.08 ^a	3.29 ^b	3.58 ^{ab}	3.61*
	I prefer organic food	4.03	4.38	4.04	4.18NS
	I seldom choose Fairtrade products	3.58	3.48	3.74	3.58NS
	I prefer products where I can be sure that the producer has received a fair price	4.41 ^a	4.93 ^b	4.73 ^{ab}	4.72**
	I usually choose the cheapest option	3.92	3.67	3.55	3.71NS
	I value quality over price	4.59 ^a	5.12 ^b	5.15 ^b	4.97*
Dietary Choices NS	I try to avoid consuming red meat	3.98	3.92	3.54	3.83NS
	I have meat-based meals most days	3.99	3.94	4.37	4.07NS
	I seldom eat vegetarian meals	4.07	3.69	4.01	3.90NS
	I eat vegetarian meals at least every second day	3.38	3.53	3.33	3.43NS
	I eat at least five portions of fruits and vegetables a day	4.27	4.43	4.74	4.47NS
	I eat very little fruit and vegetables	3.10	2.82	2.62	2.85NS

¹ 7 point scale where 1 is DOES NOT DESCRIBE ME AT ALL and 7 is DESCRIBES ME VERY WELL

Significance level: NS: Not Significant; * 99.99% confidence interval; **99.95% confidence interval; *** 99.90% confidence interval

The analysis highlighted few 'organisation and management' differences across the segments. It is however interesting to note that the moderate and high spenders have a better overview of the food they have in the home than the low spenders. This could be accounted for due to the nature of the purchasing process where purchasers have real time access to their store cupboards when making purchases and thus are more engaged in the process. Additionally, the heavy users are significantly more likely to cook meals from scratch than the other two segments. It is also interesting to note that level of spend was linked to household food related responsibilities with the low spenders tending to have less responsibilities than the other two segments.

In the case of sustainable food consumption behaviour two broad strategies can be applied; sustainable product choices (quality attribute) and sustainable dietary patterns including consumption curtailment (dietary choices). While in the current analysis no significant differences were noted across the segments with regard to dietary choices some interesting differences were observed with regard to preferences, interest and reported behaviours.

Sustainability Intentions and Willingness to take Environmentally Friendly Actions

Some clear distinctions are evident between preference/interests and behaviours/choices, but these did not translate into differences in reported behaviours. In the case of seasonality, domestic products, equity (fair price), and value significant differences were observed. While overall, respondents displayed an interest in the seasonality of products this was stronger among moderate spenders than low spenders ($p = 0.004$). This did not translate into differences in the extent to which they buy fresh fruits and vegetables that are in season with all three segments indicating a strong tendency towards this behaviour ($\bar{X} = 5.14$). Domestically produced foods were of interest to all ($\bar{X} = 4.98$) but moderate and high spenders displayed a stronger interest in these products than the low spend segment ($p \leq 0.084$). Moderate spenders also displayed a stronger preference for products where producers receive a fair price ($p < 0.05$) compared to low spenders. Interestingly this again did not translate into a more vigilant checking of country-of-origin labelling or an increased reported likelihood to choose fair trade products ($p > 0.1$). Finally, the moderate and high spenders place greater emphasis on quality over price compared to the low spenders. The evidence here would suggest that preferences alone do not translate into behaviours and online providers are not taking full advantage of potential sustainability related preferences amongst their online customers.

Fifty percent of the respondents had adopted some sustainable practices (table 5). Slight differences were noted across the segments at 53%, 49% and 47% for high, moderate and low spenders respectively. Seven percent of respondents had adopted and embedded sustainable practices in their everyday food lives, 16% had changed some of their practices for over 6 months while another 27% had made some changes in the previous 6 months. There were some notable differences between segment behaviour change profiles, with high spenders (22%) being significantly more likely to have changed their behaviour for more than six months compared to low spenders (10.5%). Furthermore, while only 7% of the sample indicated that they had adopted sustainable practices that they were 100% confident they would sustain, this raised to 9% for low spenders and dropped to 3% for the high spenders. For the 50% of the sample that had not engaged in behavioural changes for sustainability reasons, the low spenders (23%) were more likely to indicate that they did not intend to make changes in the next 6 months compared to the moderate spenders (14%), however the lower spender segment (20%) also contained the largest percentage of consumers who intended to take action within the next 30 days. Interestingly the moderate spenders had the largest percentage contemplating change within a 6-month timeframe (26%), this compared to 10.5% for low spenders.

Table 5: Sustainability intentions

		Low spenders	Moderate Spenders	High Spenders	Total	Chi-square (df) sig
		N(%)	N(%)	N(%)	N(%)	
Intention to take food behaviour related actions to become more sustainable	No intention to take action within the next 6 months.	20(23)	17(14)	14(18)	51(18)	19.12 (df 10) 0.039
	I intend to take action within the next six months.	9(10.5)	30(26)	15(19)	54(19)	
	I intend to take action within the next 30 days and have taken some behaviour steps in this direction.	17(20)	11(9)	8(10)	36(13)	
	I have changed my behaviour within the last six months.	23(27)	30(25)	22(28)	75(27)	
	I have changed my behaviour for more than six months.	9(10.5)	20(17)	17(22)	46(16)	
	I have adopted sustainable practices and I am 100% confident that I will not relapse.	8(9)	9(8)	2(3)	19(7)	
Total		86 (100)	117(100)	78(100)	281 (100)	

Generally, there is a willingness to engage in environmentally friendly behaviours (table 6) from taking personal responsibility through to rewarding or sanctioning organisations for their practices. This was not significantly different across the segments (table 6), or purchase location.

Table 6: Willingness to engage in environmentally friendly behaviours

	Low Spenders (X)	Moderate Spenders (X)	High Spenders (X)	Total (X)
I willingly and wholeheartedly take responsibility to become environment-friendly ⁱ	2.72	2.54	2.64	2.63
I am willing to pay higher prices for environment-friendly products	3.62	3.07	3.54	3.38
I will boycott the products that damage the environment in one way or other	3.34	3.35	3.50	3.38
I am willing to take steps to control my activities which are not good for the environment	2.91	2.97	3.05	2.29
I am willing to stop buying products from companies that are guilty of polluting the environment	3.07	2.90	2.96	2.97
I am willing to make sacrifices for the sake of slowing down pollution	2.97	2.90	2.95	2.94
ⁱ 7 point Likert scale where 1 is Strongly agree and 7 is Strongly disagrees				

Conclusion

According to Bord Bia (2021) 34% of Irish consumers who bought their groceries online in 2020 were ‘first-timers’. Findings here support this and indeed the evidence suggests that the ‘first-timers’ proportion may be even greater as over 50% of respondents had commenced within this timeframe. A third of these so called ‘first-timers’ may have used this service solely as a means of addressing the immediate challenges associated with Covid-19. Consequently, they intend to reduce reliance on the service in a post-Covid environment. Thus, some of the growth in demand for the service may be short lived. This, however, is offset with many indicating that they will continue to use these services at the same or higher levels and indeed 32% of these ‘first-timers’ planned to increase their reliance on the service. It is therefore unsurprising that online food groceries are now the fastest-growing food sales distribution channel (Bord Bia, 2021).

The purpose of online and physical stores may differ for customers, with some using the physical stores as their primary shopping channel and the online as a supplementary channel, whereas others may follow the reverse pattern (Chu, J., 2010). This, in part, is evidenced in the shoppers who were in the infrequent category, accounting for over half of those buying from alternative/independent stores. Decisions on preferred online purchase location or level of use of such locations does not appear to be linked to sustainable food choices. Notwithstanding this, there is a general willingness to engage in environmentally friendly behaviours from taking personal responsibility through to rewarding or sanctioning organisations for their practices. This suggests that businesses need to

continue to support product and process developments within the sustainability domain and support consumer endeavours to become more circular in their consumption behaviours. High and moderate spenders tended to have a better overview of the food in their homes than low spenders. This suggests that these platforms offer value in terms of ensuring households are appropriately stocked, thus supporting sustainable practices.

The somewhat unique context of Covid-19 pivoted many towards online services affording them the opportunity to evaluate the value proposition of such a service. This evaluation can be based on a broad range of factors such as convenience, ease of use, efficiency, and quality of service, and indeed enabling better management of household food provisioning. For some these benefits offset the perceived losses associated with an in-store shopping experience, for others this was not the case. A possible explanation for this may lie in how the in-store shopping experience is viewed. It may be experienced as a source enjoyment or as a chore. Thus, whether the shopper is hedonic or utilitarian may be important in determining long-term engagement with online services. Hedonic shoppers, may find the online service as lacking in excitement, while the utilitarian may see it as offering increased efficiency in their shopping (cf. Alba et al. 1997, Childers et al. 2001). The potential for more interactive experiences when shopping for food online may warrant further consideration if retailer wish to maximise their market share in this selling space while also supporting more sustainable practices.

4. References

Alaimo, L.S., Fiore M. and Galati A. (2020). How the Covid-19 Pandemic Is Changing Online Food Shopping Human Behaviour in Italy. *Sustainability*, 12(22), 9594; <https://doi.org/10.3390/su12229594>

Alba, J. Lynch, J. Weitz, B. Janiszewski, C. Lutz, R. Sawyer, A. and Wood S. (1997). Interactive home shopping: consumer, retailer, and manufacturer incentives to participate in electronic marketplaces. *Journal of Marketing*, 61 (3) (1997), 38-53

Berry (2018). Overview of Retail in Ireland, Kantar World Panel, Presentation by Bord Bia, January, Dublin, Ireland.

Bearing Point, 2021. *Digital Leaders in Ireland 2021*. [online] Dublin: Bearing Point. Available at: <https://www.bearingpoint.com/en-ie/our-success/digital-leaders-2021/>

Bord Bia, 2020. *Selling Ireland's Meat & Seafood in Online Grocery*. [online] Dublin: Bord Bia. Available at: <https://www.bordbia.ie/globalassets/bordbia2020/industry/think-digital/steps-for-digital-success-2021/selling-irish-meat--seafood-online-2020.pdf>

Bord Bia (2021). Bord Bia encourages Ireland's food industry to 'Think Digital'. Press release. <https://www.bordbia.ie/industry/news/press-releases/bord-bia-encourages-irelands-food-industry-to-think-digital-as-e-commerce-becomes-critical-business-driver/>

Childers, T., Carr, C., Peck, Carson, S (2001). Hedonic and utilitarian motivations for online retail shopping behavior. *Journal of Retailing*, 77, (4), 511-535.

Chu, J., Arce-Urriza, M., Cebollada-Calvo, J.J. and Chintagunta, P.K. (2010). An Empirical Analysis of Shopping Behavior across Online and Offline Channels for Grocery Products: The Moderating Effects of Household and Product Characteristics. *J. Interact. Mark.* 24, 251–268.

Eckhardt, G.M. Belk, R. and Devinney T.M (2010) Why don't consumers consume ethically? *J. Consum. Behav.*, 9 (2010), pp. 426-436, 10.1002/cb.332

Fuentes, C., 2014. Managing green complexities: consumers' strategies and techniques for greener shopping. *Int. J. Consum. Stud.* 38, 485–492. <http://dx.doi.org/10.1111/ijcs.12124>

Gilg, A. Barr, S. Ford, N (2005) Green consumption or sustainable lifestyles? Identifying the sustainable consumer. *Futures*, 37 (2005), pp. 481-504, 10.1016/j.futures.2004.10.016

Heidenstrøm N. and Hebrok M (2021) .Towards realizing the sustainability potential within digital food provisioning platforms: The case of meal box schemes and online grocery shopping in Norway. *Sustainable Production and Consumption* <https://doi.org/10.1016/j.spc.2021.06.030>