Developing consumer segments in Canada for a shift towards sustainable diets

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Abstract

Purpose – The purpose of this study was to identify consumer segments for the Canadian population based on factors guiding their food choices, to leverage their preferences and dietary characteristics as a robust starting point for the development of interventions aimed at promoting sustainable eating behaviours.

Design/methodology/approach – An online nation-wide survey was developed and administered collecting socio-demographic and food attitude and behaviour related data. A total of 3,329 respondents were included in the study. Using exploratory factor analysis to identify the determinants of food choices, followed by a cluster analysis, respondents were grouped into segments to create relatively homogeneous groups.

Findings – Five factors were identified as determinants of food choices including: sustainability and health, food influencers, joy and pleasure, convenience and familiarity. Six consumer segments were also identified: the "concerned" consumer, the "trend and tradition-follower" consumer, the "conventional" consumer, the "eat what you love" consumer, the "sustainable and healthy" consumer and the "convenience seeker." This study highlighted that convenience and familiarity tend to be important deciding factors of food choices across all segments, and almost one fifth of the consumers were reluctant to try new food concepts or brands, further emphasising the importance of familiarity. Finally, respondents reported health as one of the main reasons why they would make short-term or long-term dietary changes, and health and sustainability, were deciding factors for many consumers.

Originality/value – This study contributes to the field of consumer segmentation as it is applied to sustainable eating patterns, and to leverage points for transforming the food system. Additionally, this study used the social cognitive theory as the underlying framework to create consumer segments, and it provides a more effective understanding of the Canadian population's eating patterns, identifying two new segments. Finally, the findings support the necessity of a transition towards sustainable eating behaviours through a systems approach rather than focusing on individual level interventions that create short-term adjustments.

Keywords Sustainability, Consumer segmentation, Behaviour, Diet, Eating patterns, Leverage point

Paper type Research paper

1. Introduction

Food sustainability is one of the main aspects considered in achieving a sustainable future as food is one of the key determinants of health and social well-being, and has major environmental impacts (Willett *et al.*, 2019). Additionally, agricultural production, is a major driver of exceeding planetary boundaries, particularly livestock production (Campbell *et al.*, 2017). Thus, to achieve food system sustainability and positive health outcomes requires major shifts in eating patterns. From a systems thinking point of view, transforming the food system plays a critical role in achieving sustainability milestones. Dietary shifts towards sustainable food choices, such as lowering the consumption of animal-based products and reducing food waste are among the key leverage points that have been identified for this systemic transformation (Armstrong McKay *et al.*, 2023). Furthermore, consumer's food choices are important in advancing sustainability and food system transformation (Poore and Nemecek, 2018). Thus, a shift towards sustainable food consumption requires that a variety of personal and food environment variables be taken into consideration. This requires a mix of interventions that target both information- and market-based instruments (Reisch *et al.*, 2013).

Although there have been many interventions aimed at promoting sustainable eating, Abson *et al.* (2017) argue that most of these interventions are weak, meaning they are easy to implement but have limited potential for change. For example,

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raising awareness about the benefits of certain food choices has been a commonly used intervention. However, some research on food sustainability labels demonstrated that this approach was not the most efficient way of increasing consumers' tendency to choose environmentally-responsible food (Lazzarini *et al.*, 2018) and therefore may not result in a meaningful shift in eating patterns, possibly because the responsibility to make the right choice is still with the consumer. The complexity of food choices means that information alone is unlikely to create/encourage change (Lynes and Wolfe, 2017; McKenzie-Mohr, 2024). Therefore, in addition to information provision through tools such as labelling, a combination of interventions (for example product placement and nudging intervention in food outlets) is necessary to facilitate consumer shifts, rather than relying solely on individual agency (Olstad and Kirkpatrick, 2021; Wetherill *et al.*, 2018). Furthermore, not all interventions target the same levels and actions of the food system, and there is a need to target those leverage points that support change on a larger societal and structural level (Leventon *et al.*, 2021). Finally, no single intervention can effectively resonate with or persuade all consumers to change their food consumption patterns. Different consumer groups have unique needs, preferences and motivations (Dietrich *et al.*, 2015b; Jenkins *et al.*, 2021; Visschers *et al.*, 2013).

Therefore, understanding consumer perceptions regarding their food choices, the underlying motives, needs and wants is critical to advancing interventions aimed at improving eating behaviours and promoting sustainable food choices particularly for policy and decision makers. There is evidence that interventions that do not consider segment-specific characteristics undermine the success of potential behaviour change as a result of the intervention (Dietrich *et al.*, 2015b; Visschers and Siegrist, 2015). Thus, policies and interventions should account for segment differences among the population to have the most impact (Grunert, 2019; Jenkins *et al.*, 2021). Given the heterogeneity of eater profiles among consumers, it is essential to understand the specific characteristics of each consumer group to avoid campaigns and interventions that overlook these differences, resulting in disengaged consumers and ineffective efforts.

Segmentation is a foundational and common approach used when a population differ in needs and wants; hence potential customers are grouped into segments to create relatively homogeneous groups which are heterogeneous across segments (Grunert, 2019). It entails dividing the population into smaller groups based on their similarities to create a more targeted strategy and increase effectiveness (Dietrich *et al.*, 2015b). To identify homogeneous segments, populations can be divided into groups based on a variety of characteristics, variables and methods (Grier and Bryant, 2005). For example, geographic and socio-demographic characteristics are commonly used and valuable for intervention design. However, for behaviour change interventions, solely focusing on these variables results in overlooking certain characteristics of the target audience which can support or hinder behaviour change (Kitunen *et al.*, 2019b). Therefore, complementing geographic and socio-demographic variables with behavioural variables can create a more effective intervention (Chon and Park, 2017). Given the importance of behavioural and environmental factors as predictors of behaviour change for specific populations (Dietrich *et al.*, 2017, 2015a), behavioural theories that explain underlying assumptions and variables that form the segments are key to successful interventions.

Consumer segmentation has been an approach used by scholars in sustainable marketing literature (McDonagh and Prothero, 2014) and many studies have used consumer segmentation to explain consumer characteristics and attitudes towards general pro-environmental behaviours (González *et al.*, 2015), or specific behaviours including waste reduction (Gracia and Gómez, 2020; Li and Roe, 2024), energy consumption (Graczyk *et al.*, 2023; Słupik, *et al.*, 2021), eating behaviours (Brečić *et al.*, 2017; Funk *et al.*, 2021; Mollaei *et al.*, 2022), or social marketing programs focused on behaviours such as consumption of food with added sugar (Naughton *et al.*, 2017) or alcohol consumption (Dietrich *et al.*, 2015b). A review of the literature demonstrates that there may exist important differences and substantial amount of heterogeneity in environmentally-responsible behaviours, values and attitudes among consumers (Dolnicar and Grun, 2009).

Furthermore, the number of studies that use segmentation guided by theory to examine eating behaviours is limited (Jenkins *et al.*, 2021; Kitunen *et al.*, 2019a). Therefore, the current study uses Social Cognitive Theory (STC), as the underlying framework. This theory recognises the role of individual behaviour and environmental influence in behaviour change (Bandura, 1999). According to STC, behaviour is influenced by personal self-efficacy and behavioural capacity, surrounding actions and observational learning and behaviour reinforcements that promote behaviour change (Bandura, 1999; Schunk and DiBenedetto, 2020). For example, a study by Rakib *et al.* (2022) used STC as their guiding framework to investigate consumer sustainable consumption behaviour in the textile and apparel industry. Therefore, STC is a theoretical framework that can be used to guide studies examining consumer segmentations intended for sustainable behaviour change interventions and provide opportunities for social support that reinforces sustainable eating behaviours in particular.

In studies that specifically looked at food choices, populations from different countries have been categorised into different segments to better understand their food choices. While many of these studies were conducted in Europe, there are instances of such studies focused on populations from non-European countries as well. In Europe, studies on general food-related behaviours, Brečić *et al.* (2017) looked at the importance of different intrinsic and extrinsic food quality characteristics among consumer segments in Croatia and they identified fours factors (health and sensory characteristics, price and availability, body weight and digestion and convenience) and six consumer segments (healthy and tasty food lovers, convenient, concerned (about all aspects) and indifferent consumers). Since cultural and geographical factors play a role in what is consumed, more studies from more regions are needed to characterise eating patterns of various populations.

More recent studies have emphasised the importance of sustainable food choices. However, there are still very few global studies on consumer segmentation based on sustainable eating patterns or behaviours, without only focusing on certain instances or characteristics of sustainable food such as environmental impact or organic production. The study by

Funk *et al.* (2021) looked at environmentally-responsible eating behaviours in Switzerland and identified six segments (meat- and fish-eaters, origin-focused food savers, ambiguous consumers, food waste reducing sharers, renouncement aversives, consequent pro-environmental consumers). A study in Belgium by de Graaf *et al.* (2016) looked at sustainability attributes of food, particularly animal welfare, which is considered an ethical aspect, and identified three segments based on their purchasing attitude towards animal welfare. In contrast, Park *et al.* (2020) looked at consumer segments based on their attitude towards Korean temple food, which was considered healthy and sustainable by the authors because of its characteristics such as animal-welfare considerations and vegetarianism. A study in Australia used a consumer segmentation guided by a socio-ecological lens to identify tailored strategies that promote health eating among Australian adults (Kitunen *et al.*, 2025). This study focused on health and reducing obesity and is among the few studies that used a theoretical framework for consumer segmentation and confirmed the usefulness of theory-driven segmentation to design effective interventions. Another study focused on organic foods specifically (as a form of sustainable food choice) and identified three segments health-conscious, quality-conscious and value-conscious (Daraboina *et al.*, 2024). An example of a study that had a more comprehensive approach to food sustainability is the study by Piracci *et al.* (2023). In this study sustainable food consumption was identified as consumption that is pro-environmental, moral, healthy, frugal, thrifty and self-transcendent, which encompasses more extensive attributes of sustainable food. The study mostly focused on values that impact sustainable product purchase decision and identified three segments for Danish and Italian consumers (private benefit seekers, sustainability focused and naturalness and health driven). They concluded that healthiness and price were the two most important values for the majority of consumers and marketers are encouraged to go beyond relying only on sustainability values when promoting sustainable food products.

There are also studies that investigated more than one country. A study examining consumers' willingness to pay and perceptions related to sustainable food technologies in four countries (Australia, India, Singapore and the USA) concluded that although there are cross-cultural differences identified in segments from each country, there is a general scepticism regarding sustainable food technologies (Giacalone and Jaeger, 2023). Another study conducted across five European countries (Czechia, Spain, Sweden, Switzerland and the UK), created segments by assessing psychological factors determining consumers' attitudes towards sustainably produced meat and dairy (Yue *et al.*, 2024). This study identified four segments including low food involvement, high food involvement, price-sensitive and health- and sustainability-involved consumers. They found European consumers often view sustainability as a single concept, though they assign varying levels of importance to different types of sustainability information.

There are only two studies looking at Canadian dietary patterns. Marquis *et al.* (2019) developed eater profiles for university students in Québec, Canada, identifying four segments including The planet-nutrition-kitchen lover, The utilitarian lonely eater, The body-driven eater and The mindless eater; Mollaei *et al.* (2022) looked into the eating patterns of young Canadian adults and identified six segments including conventional, concerned, indifferent, non-trend follower, tradition-follower and eat what you love consumer. These two studies highlight the different characteristics of Canadian young adults and that this population might be to some extent homogeneous regarding certain determinants of food choices; nevertheless, this population is heterogeneous in most aspects, therefore there is a need to develop a better understanding of different consumer segments and factors that drive their food choices. However, these studies only focused on the young adult population and there is no study focused on consumer segmentation of all Canadian adults based on factors affecting their food choices while accounting for sustainability considerations. Canada is a highly diverse country, in ethnicities and food environments, which can provide new insights into consumer segments.

Using factor analysis followed by cluster analysis to identify consumer segments and factors that help explain segment attitudes (based on the importance) is a methodology commonly used in the literature (Gunden *et al.*, 2020; Rejman *et al.*, 2019). However, a review of the literature indicates that the number of consumer segmentation research focused on food and nutrition is limited (Jenkins *et al.*, 2021). Furthermore, regarding food sustainability, there is a pattern of focusing on just one specific aspect of sustainability, such as environmental impacts, ethics or animal welfare, rather than a comprehensive approach.

Trends show consumers in Canada, particularly younger generations, are becoming more aware of their food choices and have the tendency to have more sustainable diets. For example, a study on Canadian youth and young adults (Vergeer *et al.*, 2020) demonstrated that nearly 14% of their sample reported having vegetarian dietary practices, which may have been due to valuing health-conscious diets and sustainable food production. Furthermore, market research surveys also indicate that Canadians are attempting to improve their eating habits and claim to be eating and purchasing healthier food (Mintel Group Ltd, 2017; Scherme *et al.*, 2014; TheNielsenCompany, 2017). Considering these trends, there is a lack of studies looking at consumer segmentation focused on food choices, particularly sustainable food choices.

From a marketing point of view, the percentage of consumers who express their concerns towards the environment is much higher than consumers who actually purchased environmentally-responsible products (Sharma, 2021). Thus, there is a need to bridge the attitude-behaviour gap in consumer decisions related to green and sustainable products. With sufficient data and understanding of the target population, marketing tools can be used as a market-based lever or policy to promote and implement behaviour change without focusing on individual actions and behaviours which is key in creating change that is feasible and sustains overtime. Therefore, consumer segment analysis could elucidate how values and priorities of different segments influence the decision-making process. Despite existing efforts, marketers, policy makers and other decision-makers are not equipped with adequate information and tools to identify consumer segments and determinants of their food choices regarding sustainable eating behaviours.

There are three main gaps identified in literature examining interventions aimed at improving food choices to be healthier and more sustainable. Firstly, there is a lack of theoretical foundation, particularly theories that go beyond individual behaviour change, used in healthy/sustainable eating segmentation studies (Jenkins *et al.*, 2021). Secondly, many intervention studies provide limited application opportunities as they do not account for segment differences focusing on a more unified approach towards all consumers (Kubacki *et al.*, 2017). Finally, the majority of studies tend to focus on individual level behaviour change and there is a limited consideration of population level, structural (e.g., food environments) and social determinants of behaviour change (Abson *et al.*, 2017). Furthermore, there exists a lack of focus on more comprehensive sustainable eating behaviours that go beyond health and nutrition. In an effort to close these gaps, the current study aims to:

- identify the underlying personal and environmental factors impacting Canadian consumers' food choices based on SCT. This approach enables underpinning both individual and social determinants of behaviour change and addresses the role of behavioural factors as well as the surrounding environment in relation to sustainable behaviour change; and
- develop consumer segments for the Canadian population based on their eating behaviours.

Using a systems-oriented approach, will result in a more effective understanding of the population and the cause or intent of a transition towards sustainable eating behaviours rather than focusing on interventions that create short term adjustments. This study contributes to the field of consumer segmentation as it is applied to sustainable eating patterns, and to leverage points for diet transforming the food system.

2. Methodology

The aim of this study was to use data collected from a nation-wide survey to develop population segments based determinants of food choices and to help identify behaviour change strategies targeted towards specific segments. The methodology used in this study draws from Mollaei *et al.* (2022) in which they used a survey data to examine determinants of food choices among Canadian young adults and created eater profiles for the population. To create segments comprising of consumers with similar behavioural patterns (as homogenous as possible), this study included three steps; firstly, an online survey was administered; secondly, an exploratory factor analysis (EFA) was conducted to summarise data and identify latent variables (determinants of food choices); and finally, a cluster analysis was conducted to sum up the population and present consumer segments. All statistical analyses were performed using IBM SPSS28. This study received ethics approval from the University of Waterloo (ORE 41458).

2.1 Survey data collection, recruitment and design

A Canada-wide online survey was developed and administered collecting socio-demographic and food attitude and behaviour related data. Participants were recruited in November 2020 via Quest Mindshare, which is an online distribution platform. A total of 3329 respondents were included in the study. Based on available data from Statistics Canada (2020), the number and distribution (such as age, gender and province) of respondents was determined to be representative of the Canadian population. For instance, prior to commencing data analysis, an underrepresentation of respondents from Quebec was identified. In response, additional participants from that province were recruited through Quest Mindshare to improve regional representation. While some variation in demographic distribution was anticipated, the discrepancies were minimal and did not result in significant sampling bias. Participation in this survey was voluntary and anonymous, and the respondents were paid a remuneration upon completion.

Section 1 of the survey included questions related to socio-demographic characteristics. To better portray segment characteristics, respondents were asked questions regarding age, gender, immigration status, type of community and province/territories (all three territories were categorised under one subgroup due to low number of respondents), highest level of education, income and household size (to share food).

Questions in Section 2 of the survey were based on the principles of SCT which explains the interaction and relation between personal factors, environmental factors and behaviours (Bandura, 1999). Thus, the survey included 51 questions related to 11 determinants of food choices including factors such as health and wellbeing, environmental impact considerations and convenience and familiarity (refer to supplementary material for a complete list). These determinants were extracted using previous empirical research on determinants of food choices (Booth *et al.*, 2001; Deliens *et al.*, 2014; Erinosho *et al.*, 2012; Glanz *et al.*, 2005; Markovina *et al.*, 2015) and the U.S. National Cancer Institute's (NCI) Food Attitudes and Behaviours (FAB) Survey (National Cancer Institute (NCI), 2020). For each question, respondents were asked to choose the level of importance of the statement in their food choices on a 7-point Likert scale (1 being not important at all, and 7 being very important).

The third and final section of the survey included questions about diet characteristics of the respondents. As per Canada's Food Guide recommendations, eating food with others, cooking more often and involving others in planning and preparing food can help develop healthy eating habits (Health Canada, 2019). Therefore, questions in this section focused on the social component of food as a part of healthy and sustainable eating habits. The questions were guided by the framework previously developed by Glanz *et al.* (2005) which explains the role of different nutrition environments such as community and organisational (e.g., work) nutrition environments on eating patterns and how consumers interact with these environments. Using a 5-point Likert scale (1 = Never, 2 = A few meals a month, 3 = A few meals a week, 4 = Most meals and 5 = All meals), respondents were asked questions related to the frequency of:

- eating at various locations;
- eating food prepared at various locations; and
- eating in various social settings.

To gain a better insight into consumers' short- and long-term dietary changes, respondents were asked if they had tried any diets in the past five years for more than six months (long-term) (including vegan, vegetarian, Keto, Paleo, Mediterranean diet, lactose-free, gluten-free, nut-free, raw, low carb, no dietary

changes and other), and if they had made any changes in their diets in the past six months (short-term) (such as reducing meat consumption, reducing all animal-based products, increasing fruit and vegetable consumption, eating seasonally and locally, others). As budget constraints and cost are often identified as major barriers to dietary changes (Barosh *et al.*, 2014; Glanz *et al.*, 2005), respondents were asked "If you had 50% more money to allocate to your food budget, please indicate what changes, if any, you would make to your eating habits" (e.g., "eat healthier", "eat out more" and so on).

The survey was piloted with a group of 20 graduate students from the Faculty of Environment at the University of Waterloo. Adjustments were made in survey delivery using feedback provided during the pilot. Prior to the statistical analysis, data was first interrogated to detect possible errors and of the 3625 respondents, 296 questionnaires were incomplete and removed. A total of 3329 questionnaires were included in the final analysis ($n = 3329$).

2.2 Exploratory factor analysis (EFA)

To reduce the number of food choice determinants and identify common factors affecting eating behaviours methods such as EFA are often used. Factor analysis is used to summarise large data by summarising a large number of variables (in this case 51 statements) into a fewer number of latent variables. The Kaiser-Meyer-Olkin (KMO) test and Bartlett's test of sphericity determines whether data are suitable for EFA or not. If KMO > 0.9 data are marvellous for factor analysis and if Bartlett's $\rho < 0.05$ data are acceptable for factor analysis (Dziuban and Shirkey, 1974; Hair *et al.*, 2010; Kaiser and Rice, 1974). For this study KMO = 0.906 and $\rho < 0.000$ which indicated marvellous suitability for a factor analysis.

Once suitability for EFA is confirmed, the number of latent variables (factors) was determined using a scree plot (refer to the supplementary material) and six factors were extracted. Each of the factors were then labelled based on the statements that loaded on to the factor meaning the factor loading was greater that $|0.3|$ (Santos *et al.*, 2019). To ensure internal consistency of the survey items, meaning the latent variables (factors) measure the constructs they were intended to measure, Cronbach's alpha was used. For Likert-scale questionnaires, a Cronbach's alpha higher that 0.7 indicated high internal consistency (Field, 2013), which held true for the current survey. All respondents then received a score for each factor and these scores were standardised and used as the input for cluster analysis. Spearman rank correlation was also used to assess whether a statistically significant correlation exists between socio-demographic characteristics and extracted factors where a p-value smaller than 0.01 indicated statistical significance.

2.3 Step 3: Cluster analysis

To create the consumer segments, respondents should be separated into different groups based on the factors that influence their dietary choices. For segmentation K-means clustering was used which is a non-hierarchical technique used to determine the optimum number of segments for clustering cases with similar characteristics (Hair *et al.*, 2010) and has a high efficiency in the clustering process (Puspitasari *et al.*, 2020). This method has been commonly used in similar literature (Brečić *et al.*, 2017; Espinoza-Ortega *et al.*, 2016; Mollaei *et al.*, 2022; Puspitasari *et al.*, 2020). Testing different cluster numbers (K) from two to seven, indicated that six in the optimum number of clusters and ANOVA test confirmed all factors had significant impact on clustering ($\rho < 0.001$). For each segment (cluster) the score of each factor was calculated. Factors with a higher value indicate that the variable has a greater influence in differentiating the segment. Based in these values and using a similar methodology to Espinoza-Ortega *et al.* (2016) and Mollaei *et al.* (2022), each segment was labelled in a manner that best describes its characteristics. A chi-square test of independence was performed to determine whether in each segment the distribution of population based on socio-demographic factors was statistically significantly different than or similar across segments. For all socio-demographic variables $\rho < 0.001$, meaning all socio-demographic factors are significant in distinguishing consumer segments.

3. Results

3.1 Sample characteristics

A total of 3329 respondents were included in the study. Table 1 shows the socio-demographic characteristics of the respondents. The age distribution of the respondents was similar to the Canadian Population in year 2020 according to data from Statistics Canada (2020) [Stat Can] with a few notable differences. There was a slight under representation for the age group "18–24" (8.8% versus Stats Can's 14.3%) and "65 and older" (16.7% v. Stats Can's 21.4%), whereas there was a slight over representation for the age group "25–35" (20.5% v. Stats Can's16.6%) and "35–44" (20.5% v. Stats Can's 15.9%). The other two the age groups "45–54" (15.7%) and "55–64" (17.8%) was proportionally representative of the Canadian population.

For gender, there were more respondents who identified as female (62%) compared to male (37.4%). Hence there was an overrepresentation of the female population compared to the Canadian public in 2020 where there was almost an equal distribution of male and female (Statistics Canada, 2020). There were also less than 1% of the population who identified as other or preferred not to disclose their gender.[1] A majority of the respondents (94.2%) were Canadian citizens, which is higher than data reported by Statistics Canada in 2021 (Statistics Canada, 2023).[2]

More than half of the respondents (59.3%) indicated that they were living in large urban centres, almost a quarter in small urban centres (25.3%) and the rest in rural areas (15.3%). There was a slight under representation of rural respondents according to data published by Statistics Canada from the 2021 Census (Statistics Canada, 2022a). As for province of residency, the distribution of respondents from the current study is similar to the Canadian population in 2020 (Statistics Canada, 2020). Provinces with the highest proportions include Ontario (41%), Quebec (23.6%) and British Columbia (11.7%). In the questionnaire, the three territories were presented as separate options. However, due to low number of respondents all three territories were grouped into one category which comprised less than 1% of the population.

The highest level of education of the respondents was to some extent different from data reported by Statistics Canada

Table 1 Socio-demographic characteristics of the respondents ($n = 3329$)

Socio-demographic variable	Frequency (n)	%	Canadian population (%)
Age			
18–24	294	8.8	14.3
25–34	681	20.5	16.6
35–44	681	20.5	15.9
45–54	523	15.7	15.1
55–64	594	17.8	16.6
65 or older	556	16.7	21.4
Gender			
Female	2063	62	50.3
Male	1245	37.4	49.7
Other	12	0.4	
Prefer not to say	9	0.3	
Immigration status			
I am a Canadian citizen	3137	94.2	74.4
I am a permanent resident of Canada.	192	5.8	23
Type of community			
Large urban centre (more than 100,000 people)	1973	59.3	73.3
Small urban centre	845	25.4	
Rural area	511	15.3	17.8
Province and territories			
Alberta	324	9.7	11.6
British Columbia	388	11.7	13.6
Manitoba	109	3.3	3.6
New Brunswick	77	2.3	2.1
Newfoundland and labrador	65	2	1.4
Nova scotia	108	3.2	2.6
Ontario	1366	41	38.8
Prince Edward island	13	0.4	0.4
Quebec	786	23.6	22.6
Saskatchewan	88	2.6	3.1
Territories (Northwest Territories, Nunavut, Yukon)	5	0.2	0.3
Highest level of education			
No certificate, diploma or degree	208	6.2	16.2
Secondary (high) school diploma	754	22.6	26.7
Apprenticeship or trades certificate or diploma	461	13.8	8.7
College or university certificate or diploma below or equal to bachelor level	1252	37.6	21.7
University certificate or diploma above bachelor level	654	19.6	26.7
Income			
Less than $10,000	84	2.5	
$10,000–$19,999	221	6.6	
$20,000–$29,999	298	9	
$30,000–$39,999	307	9.2	
$40,000–$49,999	320	9.6	
$50,000–$59,999	321	9.6	
$60,000–$69,999	264	7.9	
$70,000–$79,999	224	6.7	
$80,000–$89,999	191	5.7	
$90,000–$99,999	223	6.7	
$100,000–$149,999	427	12.8	
More than $150,000	198	5.9	
Prefer not to answer	251	7.5	
Household size (to share food)			
One	798	24	
Two	1196	35.9	
Three	589	17.7	
Four	513	15.4	
Five or more	233	7	

in 2021 (Statistics Canada, 2022b). The category with the highest proportion of the respondents was "College or university certificate or diploma below or equal to bachelor level" (37.6%) followed by "Secondary (High) school diploma" (22.6%), "University certificate or diploma above bachelor level" (19.6%), "Apprenticeship or trades certificate or diploma" (13.8%), and lastly "No certificate, diploma or degree" (6.2%). There was an over representation in the "Apprenticeship or trades certificate or diploma" and the "College or university certificate or diploma below or equal to bachelor level" categories and an under representation in the remaining three categories.

Respondents were also asked to indicate their household income and the category with the highest and lowest proportion of respondents were "$100,000–$149,999" (12.8%) and "Less than $10,000" (2.5%), respectively. All other categories had an average of approximately 8% of the respondents. According to Statistics Canada, the average total income of households in Canada in 2020 was $100,830 (Statistics Canada, 2024). The respondents were also asked to provide the number of household members with whom they share food with (household size). The household size with the highest proportion of the respondent was "two" (35.9%), followed by "one" (24%), "three" (17.7%), "four" (15.4%) and "five or more" (7%).

3.2 Factors guiding food choices

Using EFA the determinants of food choices among the target population, were reduced to five factors including (1) Sustainability and Health, (2) Food Influencers, (3) Joy and Pleasure, (4) Convenience and (5) Familiarity. With the factor loading threshold set at |0.3|, six statements from the 51 statements did not load on to any of the five factors (refer to the supplementary material). All factors also indicated high internal consistency with a Cronbach's alpha higher than 0.7. Each factor is explained in the following section:

- *Sustainability and Health*: Of the 5 statements, 13 loaded onto the sustainability and health factor. This factor included considerations regarding sustainability characteristics of food such as low environmental impact, being fair trade, packaging, animal welfare and low consumption of animal products; it also included health considerations, including foods that were not highly processed, having no additives, being non-GMO, aligned with personal diet and helping to maintain weight, seasonal, local and organic and having low fat and low calories. From the socio-demographic characteristics, there was a statistically significant correlation between this factor and age (Spearman's rank correlation, $\rho < 0.001$, $r_s = 0.123$), education (Spearman's rank correlation, $\rho < 0.001$, $r_s=0.056$) and gender (Spearman's rank correlation, $\rho < 0.001$, $r_s= -0.0091$). Specifically, this factor tended to be more of a concern to women, respondents with higher education and older respondents.
- *Food Influencers*: The second factor was food influencers which included a variety of different types of influencers such as culture, ethnicity, religious views, food trends and advertisements, nutrition experts and friends and family. Of the 51 statements, 13 loaded on to this factor as well. This factor indicated statistically significant correlation with age (Spearman's rank correlation, $\rho < 0.001$, $r_s=0.435$), type of community (Spearman's rank correlation, $\rho < 0.001$, $r_s=0–0.139$), education (Spearman's rank correlation, $\rho < 0.001$, $r_s=0.145$), household size (Spearman's rank correlation, $\rho < 0.001$, $r_s=0.214$) and income (Spearman's rank correlation, $\rho < 0.001$, $r_s=0.089$). Specifically, younger respondents, living in urban settings, with higher education, higher income and from larger households consider food influencers as a significant factor influencing their food choices.
- *Joy and Pleasure*: The third factor was joy and pleasure where seven of the 51 statements loaded onto this factor. These statements included enjoying spending time with others, social gatherings around food, family traditions and traditional dishes, enjoying cooking and having cooking skills and trying out different recipes. Joy and Pleasure indicated high correlation with age (Spearman's rank correlation, $\rho < 0.001$, $r_s=0.055$), gender (Spearman's rank correlation, $\rho < 0.001$, $r_s= -0.104$), education (Spearman's rank correlation, $\rho < 0.001$, $r_s=0.070$), household size (Spearman's rank correlation, $\rho < 0.001$, $r_s=0.106$) and income (Spearman's rank correlation, $\rho < 0.001$, $r_s =-0.037$). In other words, female respondents, from larger households, higher in age, income and education consider joy and pleasure as a significant factor influencing their food choices.
- *Convenience*: The fourth factor was convenience. Seven of the statements loaded onto this factor including food being easy to prepare, value for money and item being on sale, taste and easily available in stores. From the socio-demographic characteristics age (Spearman's rank correlation, $\rho < 0.001$, $r_s=0.089$) and household size (Spearman's rank correlation, $\rho < 0.001$, $r_s=-0.049$) indicated statistically significant correlation. Thus, older respondents, from smaller households tend be more driven by with convenience when choosing what to eat.
- *Familiarity*: The last factor was familiarity with five of the statements loading onto this factor. Considerations related to familiarity included choosing familiar brands and food neophobia (avoiding trying new food, food from different cultures and plant-based food). Age (Spearman's rank correlation, $\rho < 0.001$, $r_s=0.134$), gender (Spearman's rank correlation, $\rho < 0.001$, $r_s= 0.048$), type of community (Spearman's rank correlation, $\rho < 0.001$, $r_s= 0.066$), education (Spearman's rank correlation, $\rho < 0.001$, $r_s=-0.138$) and income (Spearman's rank correlation, $\rho < 0.001$, $r_s=-0.155$) were the socio-demographic characteristics that demonstrated statistically significant correlation with familiarity. Hence, there is more concern regarding familiarity of food choices among older, male respondents, living in rural areas, with lower education and income.

3.3 Consumer segments

The respondents were divided into clusters with similar behavioural patterns (as homogenous as possible), based on the importance placed on the identified factors in their food choices. There were six clusters (consumer segments) identified and labelled using the cluster factor value figure which illustrated the level of importance placed on each of the factors by each segment. These segments include (1) The

Table 2 Socio-demographic characteristics of the consumer segments

Categories*	The concerned consumer (%)	The trend and tradition-follower consumer (%)	The conventional consumer (%)	The eat what you love consumer (%)	The sustainable healthy consumer %	The convenience seeker (%)
Overall population	22.5	18.9	17.5	16.0	15.6	9.5
Gender						
Male	30	38	34	37	42	53
Female	70	62	65	61	57	46
Other or prefer not to say	0	0	0	2	1	1
Age						
18–24	5	11	3	11	9	20
25–34	18	25	8	22	22	34
35–54	35	42	30	36	39	34
55–64	22	12	29	16	16	6
65 or older	19	10	30	15	14	6
Type of community						
Urban	84	90	79	87	83	86
Rural	16	10	21	13	17	14
Province and territories**						
Atlantic region	7	7	11	6	9	7
Central Canada	65	67	66	64	59	69
Prairie provinces	13	16	14	17	21	11
West Coast	14	10	10	13	11	13
Territories	0	0	0	0	0	1
Highest level of education						
High school diploma or lower	22	21	40	27	35	34
Apprenticeship or trades certificate or diploma	16	12	17	12	13	11
College or university certificate or diploma	63	67	42	61	52	55
Income						
Under $30,000	12	14	28	20	18	20
$30,000-$69,999	41	42	43	45	44	46
$70,000-$149,999	40	37	22	28	30	31
More than $150,000	8	8	3	6	5	4
Prefer not to answer	7	6	9	9	7	6
Household size (based on how many people share food in the household)						
One	18	15	31	34	28	22
Two	46	29	39	33	32	30
Three	16	25	13	14	16	26
Four	15	21	11	13	16	17
Five or more	5	11	5	5	9	6

Note(s): *Analyses of variance revealed a significant effect of food consumer segments for all descriptive variables, $p < 0.001$. To summarise socio-demographic data, the number of categories were reduced ** Province and territories were reduced to; Atlantic region (Newfoundland and Labrador, Prince Edward Island, Nova Scotia and New Brunswick), Central Canda (Quebec and Ontario), Prairie provinces (Manitoba, Saskatchewan and Alberta), West coast (British Columbia) and Territories (Northwest Territories, Nunavut and Yukon)

"concerned" consumer, (2) The "trend and tradition-follower" consumer, (3) The "conventional" consumer, (4) The "eat what you love" consumer, (5) The "sustainable and healthy" consumer and (6) The "convenience seeker". The most prominent characteristics and the highlights from the socio-demographic distribution within each segment is discussed in the following section and outlined in Table 2:

- *The 'concerned' consumer*: This is the largest segment, with 22.50% of the respondents. Consumers in this segment place a high level of importance on all identified factors, particularly convenience and familiarity. Across all segments, this group had the highest percentage of female respondents (70%), residence of the west coast province (British Columbia) (14%), respondents with an annual income higher than $70K (48%) and household size of two persons (46%).
- *The 'trend and tradition-follower' consumer*: Making up 18.9% of the population, this segment is mostly driven by food influencers (such as friends, culture and ethnicity, trends and experts) and is least driven by about joy and pleasure. These consumers are also to some extent driven by the health and sustainability implication of their food choices. This segment had the highest proportion of respondents aged 35–54 (42%), living in urban areas (90%), with a college or university certificate or diploma (below, equal to or higher than bachelor level) (67%), income more than $150,000 (8%) and household size of more than 4 people (32%).
- *The 'conventional' consumer*: This segment is the most driven by the familiarity of their choices and had 17.5% of the population. Therefore, they were reluctant to try new foods or brand and tend to choose options that they are used to eating. This segment had the highest number of respondents who: were older than 55 (59%), were rural residents (30%) or from the Atlantic region** (11%) (refer to the note below Table 2), had apprenticeship or trades certificates or diplomas or any lower education (57%), had an annual income less than $30k (28%) and lived in a one-person household (31%).
- *The 'eat what you love' consumer*: This segment, representing 16% of the population, considers the 'joy and pleasure' factor considerably more than the other segments. For consumers in this segment, food related activities, such as eating or cooking, are a social activity that brings them joy, and it is an opportunity for them to try new foods from various cultures. In addition, familiarity and convenience are also important. In this segment had a demographic distribution similar to the overall population. However, it had the highest percentage of the respondents that chose "preferred not to say" for gender across all segments (although it was a very small percentage, only 2%).
- *The 'sustainable and healthy' consumer*: The fifth segment, with 15.6% of the population, was mostly driven by the health and sustainability implications of their food choices. Therefore, these consumers care about the environmental and social impacts of their food choices as well as impact on their individual health. The demographic distribution of this segment was similar to the overall population.
- *The 'convenience seeker'*: This was the sixth and smallest group, with 9.5% of the population. For this segment, the most important deciding factor is convenience which taste, cost, availability and food that is easy to prepare. This segment had the highest proportion of male respondents and was the only group where the male respondents were more than the female respondents with 53% and 46% of the population, respectively. Across all segments, this group also had the highest number of respondents aged 18–24 (20%), living in central Canada (69%) or the territories

Table 3 Frequency of food consumption at different locations and social settings. The mean of answers, based on a five-point Likert scale is provided, as data was not skewed

Question	Mean	Interpretation
How frequently do you eat at the following locations?		
At home	4.23	Most meals
At work	2.16	A few meals a month
At restaurants	2.33	A few meals a month
Others*	2.33	A few meals a month
How frequently do you eat food prepared at the following locations?		
At home	4.06	Most meals
At work	1.82	A few meals a month
At restaurants	2.49	A few meals a month
Others**	2.28	A few meals a month
How frequently do you eat in the following social settings?		
Alone	3.08	A few meals a week
With a partner	3.18	A few meals a week
With nuclear family	2.65	A few meals a week
With extended family	2.21	A few meals a month
With friends	2.45	A few meals a month
Other**	2.17	A few meals a month

Note(s): 1 = Never, 2 = A few meals a month, 3 = A few meals a week, 4 = Most meals, 5 = All meals *Others: friends, family, in their car/bus, **Others: friends and family

(1%), having an annual income of $30,000-$69,999 (46%), with a household size of three people (26%).

3.4 Dietary characteristics

In terms of dietary characteristics, (Health Canada, 2019) respondents reported having most meals at home and a few meals a month at work or at restaurants (see Table 3). In the "other" category, respondents mentioned eating their food on the bus or in their car. For frequency of eating food prepared at different locations, most meals were prepared at home, a few meals at restaurants and very few meals prepared at the workplace. Regarding frequency of eating in different social settings, respondents reported eating a few meals a week alone, with a partner and with nuclear family and a few meals a month with extended family and friends.

When exploring long-term dietary changes (changes in diets in the past 5 years for more than six months), respondents were asked to choose up to three answers from a list of diets they had tried (n indicates the number of times an option was chosen). Among the answers "none of the above" (43%, $n = 1896$) was chosen the most, followed by "vegetarian" (12.3%, $n = 546$) and low carb (8.8%, $n = 383$). Other diets mentioned by the respondents were fasting/intermittent fasting, low calorie, weight watchers, pescatarian and low sodium/sugar/salt. As for reasons for long-term dietary changes, the top three voted reasons were health (37%, $n = 1092$), weight control (25%, $n = 718$) and animal welfare (9%, $n = 249$).

Considering short-term dietary changes made in the previous six months, respondents could choose up to three answers. The top three selected answers were increasing fruits and vegetables consumption (40%, $n = 1575$), eating seasonally and locally (25%, $n = 991$) and reducing meat consumption (23%, $n = 897$). Other changes mentioned by the respondents were reducing sugar, eating low sodium or low carbohydrate foods and reducing processed food consumption. The top three voted reasons for making these changes were health (36%, $n = 1729$), weight control (19%, $n = 931$) and cost (13%, $n = 642$).

Respondents were also asked how cost or budget affects how they eat by choosing up to three answers (n indicates the number of times an option was chosen). If respondents could increase their food budget by 50%, the top three voted answers were eating healthier (24%, $n = 1581$), eating higher quality food (21%, $n = 1378$) and making no changes to their eating habits (14%, $n = 915$).

Finally, when asked which factors were the greatest motivators to change their diet (up to three choices and n indicates the number of times an option was chosen), the top three voted answers were information on nutrition and health aspects of food products (26%, $n = 1563$), recommendation by nutrition experts (22%, $n = 1294$) and information on environmental impact of food products (16%, $n = 964$). Other motivations to change mentioned by the respondents were lower prices and doctor recommendations.

4. Discussion

The aim of this study was to identify consumer segments for the Canadian population based on factors guiding their food choices, to leverage their preferences and dietary characteristics as a robust starting point for the development of interventions aimed at promoting improved eating behaviours. Six segments were identified:

1 the "concerned" consumer (22.5%);
2 the "trend and tradition-follower" consumer (18.9%);
3 the "conventional" consumer (17.5%);
4 the "eat what you love" consumer (16.0%);
5 the "sustainable and healthy" consumer (15.6%); and
6 the "convenience seeker" (9.5%).

In this study a variety of socio-demographic (e.g., gender and age), behavioural (e.g., social influence and neophobia) and environmental (e.g., access, price and affordability) variables related to both the individual and the social context were used to create and interpret each segment. These variables were guided by STC and similar to the findings from previous literature (Kitunen *et al.*, 2025; Naughton *et al.*, 2017; Rakib *et al.*, 2022), consumer segmentations that are guided by a theoretical framework result in more effective intervention design.

This study contributes new insights to the field of consumer segmentation and sustainable food choices. Specifically, two new consumer segments were identified for the Canadian population, the "trend and tradition-follower" and the "sustainable and healthy" consumer. Furthermore, although the "indifferent" segment has been the most common segment within the literature (for example, this segment was identified in studies on consumers in Malawi (Simunaniemi *et al.*, 2013), Spain (Montero-Vicente *et al.*, 2019), Croatia (Brečić *et al.*, 2017) and among young adults in Canada (Mollaei *et al.*, 2022) this type of segment was not identified in this study. Moreover, this study highlighted that convenience and familiarity tend to be important deciding factors in food and eating preferences across all segments, and almost one fifth of the consumers were reluctant to trying new food concepts, choices, or brands, further emphasising the importance of familiarity. Finally, respondents reported health as one of the main reasons why they would make short term or long-term dietary changes, and health and sustainability, were deciding factors for many consumers.

Results from this study, particularly the lack of an "indifferent" segment, showed that Canadian consumers value different factors when deciding what to eat, and while consumer segments have different characteristics, the majority placed the greatest emphasis on convenience and familiarity, including the "concerned" consumer (which was the largest segment), the "eat what you love" consumer and the "conventional" consumer. Previous literature has also identified a strong positive correlation between convenience and familiarity, particularly as they relate to sustainable food choices. (Pula *et al.*, 2014; Yue *et al.*, 2024). The "trend and tradition-follower" consumer, a new segment that was identified, was reluctant to try new food, specifically plant-based products. One previous study focused on Hungarian young adults and their motivation to buy local food also identified a "trend-follower" segment (Kovács *et al.*, 2022), which were inclined to choose traditional food. However, this study was only focused on local food and did not explore attitudes around any other food characteristic and choices.

Convenience was identified as a deciding factor of all segments except the "conventional" consumer and showed high correlation

with older respondents. Moreover, the "convenience seeker" segment who considers convenience factors, such as availability and food that is easy to prepare as their top priority, had the highest proportion of male respondents. Familiarity was identified as a deciding factor of all segments except the "convenience seeker". There was also a correlation between familiarity and respondent being older, male and living in rural areas. Other studies have also indicated that men are more likely to make practical food choices and have higher meat consumption frequencies (Schnettler *et al.*, 2017a, 2017b). Lack of awareness regarding gender-based differences in food preferences and dietary needs has been identified as one of the major shortfalls regarding sustainable and plant-forward diets (Klapp *et al.*, 2025); this study contributes to a better understanding of this.

There have been previous consumer segmentation studies looking into food neophobia including plant-based products and food technology (Schnettler *et al.*, 2017a, 2017b). Shifting to plant-based alternatives offers a promising path toward sustainable diets (Willett *et al.*, 2019). Additionally, there is evidence that consumers with sustainability-driven food choices have a decreased neophobia towards plant-based meat alternatives (Faria and Kang, 2022). Consequently, it is essential to closely examine neophobia toward plant-based products across different consumer.

Respondents identified health as the main reason for dietary shifts and indicated they had tried switching to healthier diets, such as eating more fruit and vegetables and foods with low sodium. Furthermore, the "health and sustainability" factor was identified as one of the determinants of food choices across three segments, including the "concerned", the "trend and tradition-follower" and the "sustainable and healthy" consumer. However, health and sustainability considerations were the primary food choice determinants of only one group of consumers (the "sustainable and healthy" consumer), whereas for the other two segments it was less significant; furthermore, there seems to be awareness of health and sustainability within the "concerned" consumer, providing new insights into potential ways to shift dietary patterns. Nevertheless, even though the "sustainable and healthy" consumer segment indicated valuing health and sustainability more than other consumers, they were still concerned with familiarity and convenience of their food choices and might not opt for the healthy sustainable choice when the choice is not available, accessible, or simply does not appeal to their taste.

In the literature exploring consumer segmentation related to food choices, there are studies that have identified segments with health considerations (Brečić *et al.*, 2017; Burton *et al.*, 2017; Koksal, 2019; Lara *et al.*, 2014; Milošević *et al.*, 2012; Saba *et al.*, 2019; Wetherill *et al.*, 2018); however, these segments often represent a smaller portion of the overall group, with a lower percentage of respondents. Regarding sustainability, fewer studies have identified segments characterised by environmentally-responsible behaviours (Verain *et al.*, 2016; Yilmazsoy *et al.*, 2015). Even in the current study sustainability considerations and health considerations loaded onto just one factor and created one segment. This could be due to the fact that healthiness is often associated with sustainability and consumers tend to have misconceptions or misjudge the environmental effects of foods (Lazzarini *et al.*, 2016; Mollaei *et al.*, 2023).

It could be concluded that consumers are familiar with the health benefits of their food choices and are striving to have a healthier diet. However, existence of contextual limitations or barriers, results in an opposite behaviour (Olstad and Kirkpatrick, 2021) where convenience and familiarity become a more dominant factor guiding food choices. Furthermore, respondents reported making both short-term and long-term dietary changes that are considered sustainable, such as trying a vegetarian diet (12% of respondents) or reducing meat consumption (23% of respondents). This indicates opportunities for sustainable dietary shifts, highlighting the importance of transforming short-term changes into lasting habits over time. In Western food environments there is a prevalence of external cues associated with foods that are considered unhealthy and unsustainable (such as ultra-processed food; Sample *et al.*, 2015). Therefore, as a leverage point for behaviour change, making sustainable and healthy food choices with familiar brands, easily accessible and available in food stores, could increase the likelihood of consumers purchasing them.

4.1 Implications for dietary shifts

Ultimately, food choices are contingent on the context where they are made and eating patterns are dependent on a variety of nutrition environments including consumer, community and organisational (work, school) nutrition environments (Glanz *et al.*, 2005). For example, previous research on eating behaviours of Canadian university students indicated that in addition to individual variables, the university food environment (including meal plans or available food outlets) is among the most important determinants of students' eating behaviours (Mollaei *et al.*, 2023). Healthy and sustainable eating involves more than just the foods consumed; it also includes aspects such as where, when, why and how meals are enjoyed (Health Canada, 2019). Canada's Food Guide has also identified elements of healthy eating habits that highlight the importance of food-related activities (and not just the food). For example, cooking more often and the social setting where food is consumed and prepared are components that help improve enjoying food and food-related activities, which can result in improved eating habits and food choices (Health Canada, 2019). Given that joy and pleasure was one of the determinants identified for food choices, focusing on increasing the enjoyment of food can play a valuable role in supporting healthy eating practices. Simple practices, such as involving family members in meal preparation, taking time to savour meals mindfully and sharing meals with friends or family can further promote enjoyment and satisfaction, fostering a more holistic approach to healthy eating. Therefore, to achieve a population-level dietary shift, food environments including where food is purchased, prepared and consumed require structural transformations to facilitate the transition. This further highlights the importance of considering how a chain of different actions or leverages can reinforce or hinder each other, which can be missed if the focus is only on individual actions or one behaviour (Fischer and Riechers, 2019).

Although there are instances of effective individual-level interventions such as knowledge provision or motivation interventions, improving population level food consumption

patterns requires strategies that go beyond focusing on only behavioural aspects (Olstad and Kirkpatrick, 2021). For example, respondents indicated they would eat healthier or higher quality food if they had more budget allocated to food, which could translate into an opportunity for decision-makers to focus on interventions related to the cost of healthy food (Maller, 2015). However, given the complexity of consumers' attitudes, behaviours and decision-making process, a single-pronged approach that only focuses on affordability might not be effective. Results from the current study demonstrated that although many consumers indicated changing diets for health reasons and expressed willingness to eat healthier if cost was not a barrier, the "sustainable and healthy" consumer was a small segment of the overall population.

Furthermore, this research highlights an opportunity to explore the specific personal and food environment barriers and motivators unique to each segment, and to examine how targeted interventions can encourage a shift towards diets that promote personal, public and planetary health. For example, given the lack of interest in trying new (neophobia) and plant-based food and importance of familiarity, it is important to design dietary shift interventions that focus on nudging the consumer to improve their food choices rather than promoting a product as a new alternative or replacement. Consumers are more likely to opt for plant-based options if the taste, brand or concept is familiar for them.

By mapping each consumer segment to its core motivations and barriers, policymakers and marketers can implement segmentation-informed choice architecture, including defaults, financial incentives and tailored messaging strategies (Huangfu *et al.*, 2024; Tirion *et al.*, 2025). For example, based on findings from the current study, marketers targeting Canadian consumers should avoid focusing too narrowly on the environmental or social benefits of a product. Instead, bundling environmental claims with attributes such as familiarity and convenience (e.g., grab-and-go formats and economic value incentives) could result in a strategy effective across many segments. Moreover, the "sustainable and healthy" consumer segment may respond best to transparent sustainability certifications and health-related endorsements, while the "trend and tradition-follower" consumer may be more influenced by cultural figures and peer advocates. Understanding where the target market falls within these segments is essential for designing and implementing effective strategies.

Ultimately, restructuring food environments can reinforce behaviour change across all segments, shifting the focus from individual-level awareness to systemic, structural changes in food choice norms. Therefore, a systems approach and a paradigm shift that addresses food choices from a sociological point of view could generate improved consumption patterns without solely holding the consumer responsible to make the right decision. This paradigm shift can also translate into providing support and training for nutrition experts (including dietitians), as respondents in this study identified recommendation by nutrition experts as well as health/nutrition information as one of the main factors that would motivate them to shift their diets.

4.2 Strengths and limitations of the study

To our knowledge this was the first study to conduct a consumer segmentation of the Canadian population based on factors guiding their food choices as well as dietary characteristics. Although, previous studies (Marquis *et al.*, 2019; Mollaei *et al.*, 2022) have taken similar approaches to consumer segmentation focused on Canadian consumers, these studies only included young adults. The current study adopted a more comprehensive approach than similar consumer segmentation studies by incorporating psycho-behavioural and environmental variables, examining dietary characteristics (such as where food is consumed, how it is prepared and dietary shifts) and addressing all aspects of food sustainability in the survey. Questions included in the current study covered food environment factors, as well as behavioural and individual characteristics, whereas the common approach to consumer segmentation on food and nutrition-related research is the use of psycho-behavioural segmentation (Verain *et al.*, 2016; Yilmazsoy *et al.*, 2015). This approach was key to identifying the nuances between different groups while identifying opportunities to design and implement both individual-level and population-level interventions that go beyond individual behaviours and decision making and emphasis the role of contextual constraints.

There is a limitation concerning generalisability of the results as this study was conducted in Canada as diets, behaviours and food environments vary widely between different geographical locations and countries. However, the current research can be replicated in terms of methodology and results can be used as a starting point for future research in other countries. There is also the inherit limitations associated with self-reported data. There is a potential that respondents answered the questions in a manner that would enhance social desirability (Van de Mortel, 2008) which could result in under or over exaggerating their behaviours. Moreover, self-reported data might not reflect consumers' actual behaviour, but rather their beliefs and perceptions (Gatersleben, 2002). Nevertheless, given the aim and scope of this research using self-reported data as a proxy for real behaviour is an acceptable and meaningful methodology commonly used in similar research (Funk *et al.*, 2021).

Finally, although the respondents were asked to answer the questions based on their habits prior to the COVID-19 pandemic, given that they completed the survey during the lockdowns, results might be skewed to reflect their habits at the time of the pandemic and not their regular habits. Particularly, in questions regarding places where they prepare or eat their food, "at home" tends to have a higher percentage compared to the other choices which might be due to food outlet closures and work from home arrangements at the time. There is evidence that food consumption, behaviours and patterns had changed during the COVID-19 pandemic (Ammar *et al.*, 2020). A review of the literature also identified that many consumers leaned more towards considering familiarity as one of the main determinants of their food choices (Skalkos and Kalyva, 2023), which was in line with findings from the current study. Given the uncertainty felt during the lockdowns, familiarity of food choices that consumers know and trusted helped consumers address anxiety (Mertens *et al.*, 2022). Furthermore, during the pandemic there was a heightened food risk and safety concern among consumers (Liu *et al.*, 2023; Veselovská, 2023). Similar to our findings where sustainability and health were loaded on the same factor (and sustainability was not a stand-alone consideration), other research conducted during this time also highlighted the importance of health and familiarity and a lower concerns related

to sustainability, ethical or environmental impact of food choices as a result of the pandemic (Yue *et al.*, 2024).

4.3 Suggestions for future research

The current research provides a comprehensive methodological approach to consumer segmentation based on a theoretical framework (STC) as well as insight into consumer characteristics that can be leveraged to design and implement behaviour change interventions for policy makers, practitioners and researchers. Therefore, future research can further examine the role of specific food choice determinants among each consumer segment to identify which behaviour change approach (such as communication, regulation or fiscal methods) is the most appropriate complementing previously identified tools such as the behaviour change wheel (Michie *et al.*, 2011). Future research can also focus on further separating segments, particularly concerning health and sustainability. Given the significant impact of food choices and dietary patterns on health and the natural environment, understanding consumers' perceptions and behaviour around sustainable food choices is crucial for a move towards sustainable food systems.

Future research should also prioritise the inclusion of underrepresented and marginalised groups, particularly those from Canada's three territories and individuals identifying outside the gender binary. These populations are often absent or underrepresented in data sets and commercial survey panels, resulting in a limited understanding of their food-related attitudes and behaviours. Given the unique food environments, cultural practices, logistical constraints and systemic inequities that may influence dietary choices of these groups, targeted studies are needed to capture their lived experiences more accurately. Doing so will enhance the inclusivity and generalisability of research findings and support the development of equitable and culturally responsive interventions that promote sustainable and healthy eating across diverse population segments.

Finally, as mentioned in the limitations, although this study focused on the Canadian population, the outcome and methodology can be used as a reference or starting point for both future research and more practical intervention planning. Studies that examined more than one country (Giacalone and Jaeger, 2023; Yue *et al.*, 2024), have concluded that there are cross-cultural and distribution differences in segments from each country. Furthermore, dietary patterns and hence diet-related greenhouse gas emission (which is a major contributor to food system sustainability) differ by region and research has shown a positive correlation between socio-demographic characteristics (such as social expenditure) and emissions (Vázquez-Rowe *et al.*, 2017). Therefore, country-specific considerations are integral to the design and implantation of research and strategies aimed at promoting sustainable food consumption whilst certain similarities and approaches can be adapted internationally.

5. Conclusion

The goal of this study was to take a holistic approach to examine determinants of food choices and specific subgroup characteristics of Canadian consumers through conducting consumer segmentation. By doing so, this study enables decision-makers and different stakeholders to identify leverage points for dietary shifts which can ultimately result in achieving a sustainable food system. Findings from this research underscore the need for well-rounded, segment-specific interventions in food choices that adopt a systems approach rather than solely focusing on individual behaviours. If the end goal is to achieve a transition to sustainable food practices on a population level, it is important to create an environment that facilitates and promotes making these choices.

Notes

[1] The authors acknowledge that recommended wording for gender questions has changed since this survey was designed in 2020. The 'other' category would be now included as "prefer to self-identify" with a text entry.

[2] In the Census Profile by Statistics Canada, the definition of Non-immigrants is persons who are Canadian citizens by birth, and Immigrants are persons who landed in Canada prior to May 2021 or permanent residents. It also included immigrants who have obtained Canadian citizenship. Therefore, the portion of Canadian Citizens (both born in Canada and obtained) will be higher than 74.4% which is the portion of Non-immigrants and closer to the percentage from the current research.

References

Abson, D.J., Fischer, J., Leventon, J., Newig, J., Schomerus, T., Vilsmaier, U., von Wehrden, H., Abernethy, P., Ives, C. D., Jager, N.W. and Lang, D.J. (2017), "Leverage points for sustainability transformation", *Ambio*, Vol. 46 No. 1, pp. 30-39, doi: 10.1007/s13280-016-0800-y.

Ammar, A., Brach, M., Trabelsi, K., Chtourou, H., Boukhris, O., Masmoudi, L., Bouaziz, B., Bentlage, E., How, D., Ahmed, M., Müller, P., Müller, N., Aloui, A. and Hammouda, O. (2020), "Effects of COVID-19 home confinement on eating behaviour and physical activity : results of the", *Nutrients*, Vol. 12, p. 13.

Bandura, A. (1999), "Social cognitive theory: an agentic perspective", *Asian Journal of Social Psychology*, Vol. 2 No. 1, pp. 21-41.

Barosh, L., Friel, S., Engelhardt, K. and Chan, L. (2014), "The cost of a healthy and sustainable diet-who can afford it? ", *Australian and New Zealand Journal of Public Health*, Vol. 38 No. 1, pp. 7-12, doi: 10.1111/1753-6405.12158.

Booth, S.L., Sallis, J.F., Ritenbaugh, C., Hill, J.O., Birch, L.L., Frank, L.D., Glanz, K., Himmelgreen, D.A., Mudd, M., Popkin, B.M., Rickard, K.A., Jeor, S.S. and Hays, N.P. (2001), "Environmental and societal factors affect food choice and physical activity: rationale, influences, and leverage points", *Nutrition Reviews*, Vol. 59 No. 3, pp. S21-S36.

Brečić, R., Mesić, Ž. and Cerjak, M. (2017), "Importance of intrinsic and extrinsic quality food characteristics by different consumer segments", *British Food Journal*, Vol. 119 No. 4, pp. 845-862, doi: 10.1108/BFJ-06-2016-0284.

Burton, M., Reid, M., Worsley, A. and Mavondo, F. (2017), "Food skills confidence and household gatekeepers' dietary

practices", *Appetite*, Vol. 108, pp. 183-190, doi: 10.1016/j.appet.2016.09.033.

Campbell, B.M., Beare, D.J., Bennett, E.M., Hall-Spencer, J.M., Ingram, J.S.I., Jaramillo, F., Ortiz, R., Ramankutty, N., Sayer, J.A. and Shindell, D. (2017), "Agriculture production as a major driver of the earth system exceeding planetary boundaries", *Ecology and Society*, Vol. 22 No. 4, doi: 10.5751/ES-09595-220408.

Chon, M.G. and Park, H. (2017), "One does not fit all: health audience segmentation and prediction of health behaviors in cancer prevention", *Health Marketing Quarterly*, Vol. 34 No. 3, pp. 202-216, doi: 10.1080/07359683.2017.1346434.

Daraboina, R., Cooper, O. and Amini, M. (2024), "Segmentation of organic food consumers: a revelation of purchase factors in organic food markets", *Journal of Retailing and Consumer Services*, Vol. 78, p. 103710. doi: 10.1016/j.jretconser.2024.103710.

de Graaf, S., Vanhonacker, F., Van Loo, E.J., Bijttebier, J., Lauwers, L., Tuyttens, F.A.M. and Verbeke, W. (2016), "Market opportunities for animal-friendly milk in different consumer segments", *Sustainability* (Switzerland), Vol. 8, pp. 1-17, doi: 10.3390/su8121302.

Deliens, T., Deforche, B., De Bourdeaudhuij, I. and Clarys, P. (2014), "Determinants of eating behaviour in university students: a qualitative study using focus group discussions", *BMC Public Health*, Vol. 14 No. 1, p. 53, doi: 10.1186/s12889-015-1553-4.

Dietrich, T., Rundle-Thiele, S., and Kubacki, K. (2017), *Segmentation in Social Marketing: Process, Methods and Application*, Springer, Berlin/Heidelberg, Germany.

Dietrich, T., Rundle-Thiele, S., Leo, C. and Connor, J. (2015a), "One size (never) fits all: segment differences observed following a school-based alcohol social marketing program", *Journal of School Health*, Vol. 85 No. 4, pp. 251-259, doi: 10.1111/josh.12244.

Dietrich, T., Rundle-Thiele, S., Schuster, L., Drennan, J., Russell-Bennett, R., Leo, C., Gullo, M.J. and Connor, J.P. (2015b), "Differential segmentation responses to an alcohol social marketing program", *Addictive Behaviors*, Vol. 49, pp. 68-77, doi: 10.1016/j.addbeh.2015.05.010.

Dolnicar, S. and Grun, B. (2009), "Environments Be harvested for improved sustainable management",? *Environ Behav*, Vol. 41, pp. 693-714.

Dziuban, C. and Shirkey, E. (1974), "When is a correlation matrix appropriate for factor analysis? Some decision rules", *Psychological Bulletin*, Vol. 81 No. 6, pp. 358-361.

Erinosho, T.O., Moser, R.P., Oh, A.Y., Nebeling, L.C. and Yaroch, A.L. (2012), "Awareness of the fruits and Veggies-More matters campaign, knowledge of the fruit and vegetable recommendation, and fruit and vegetable intake of adults in the 2007 food attitudes and behaviors (FAB) survey", *Appetite*, Vol. 59 No. 1, pp. 155-160, doi: 10.1016/j.appet.2012.04.010.

Espinoza-Ortega, A., Martínez-García, C.G., Thomé-Ortiz, H. and Vizcarra-Bordi, I. (2016), "Motives for food choice of consumers in Central México", *British Food Journal*, Vol. 118 No. 11, pp. 2744-2760, doi: 10.1108/BFJ-04-2016-0143.

Faria, A.A. and Kang, J. (2022), "It's not just about the food: motivators of food patterns and their link with sustainable food neophobia", *Appetite*, Vol. 174, doi: 10.1016/j.appet.2022.106008.

Field, A. (2013), *Discovering Statistics Using IBM SPSS Statistics*, Sage.

Fischer, J. and Riechers, M. (2019), "A leverage points perspective on sustainability", *People and Nature*, Vol. 1 No. 1, pp. 115-120, doi: 10.1002/pan3.13.

Funk, A., Sütterlin, B. and Siegrist, M. (2021), "Consumer segmentation based on stated environmentally-friendly behavior in the food domain", *Sustainable Production and Consumption*, Vol. 25, pp. 173-186, doi: 10.1016/j.spc.2020.08.010.

Gatersleben, B. (2002), "Measurement and determinants of environmentally significant consumer behavior", *Environment and Behavior*, Vol. 34 No. 3, pp. 335-362.

Giacalone, D. and Jaeger, S.R. (2023), "Consumer acceptance of novel sustainable food technologies: a multi-country survey", *Journal of Cleaner Production*, Vol. 408, p. 137119, doi: 10.1016/j.jclepro.2023.137119.

Glanz, K., Sallis, J.F., Saelens, B.E. and Frank, L.D. (2005), "Healthy nutrition environments: concepts and measures", *American Journal of Health Promotion*, Vol. 19 No. 5, pp. 330-333, doi: 10.4278/0890-1171-19.5.330.

González, E.M., Felix, R., Carrete, L., Centeno, E. and Castaño, R. (2015), "Green shades: a segmentation approach based on ecological consumer behavior in an emerging economy", *Journal of Marketing Theory and Practice*, Vol. 23 No. 3, pp. 287-302, doi: 10.1080/10696679.2015.1032395.

Gracia, A. and Gómez, M.I. (2020), "Food sustainability and waste reduction in Spain: consumer preferences for local, suboptimal, and/or unwashed fresh food products", *Sustainability* (Switzerland), Vol. 12 No. 10, p. 4148, doi: 10.3390/su12104148.

Graczyk, A.M., Kusterka-Jefmańska, M., Jefmański, B. and Graczyk, A. (2023), "Pro-Ecological energy attitudes towards renewable energy investments before the pandemic and European energy crisis: a Segmentation-Based approach", *Energies (Basel)*, Vol. 16 No. 2, p. 707, doi: 10.3390/en16020707.

Grier, S. and Bryant, C.A. (2005), "Social marketing in public health", *Annual Review of Public Health*, Vol. 26 No. 1, pp. 319-339.

Grunert, K.G. (2019), "International segmentation in the food domain: issues and approaches", *Food Research International*, Vol. 115, pp. 311-318, doi: 10.1016/j.foodres.2018.11.050.

Gunden, C., Atis, E. and Salali, H.E. (2020), "Investigating consumers' green values and food-related behaviours in Turkey", *International Journal of Consumer Studies*, Vol. 44 No. 1, pp. 53-63, doi: 10.1111/ijcs.12544.

Hair, J.F., Black, W.C., Tatham, R.L. and Anderson, R.E. (2010), *Multivariate Data Analysis*, 7th ed., Prentice Hall International, London.

Health Canada (2019), "Canada's food guide".

Huangfu, P., Dpsych, W., Msc, W., Critchley, J.A., Huangfu, P., Pearson, F., Marwan Abu-Hijleh, F., Wahlich, C., Willis, K., Awad, S.F., Abu-Raddad, L.J. and Critchley, J.A. (2024), "Impact of price reductions, subsidies, or financial incentives on healthy food purchases and consumption: a systematic review and meta-analysis, review ", *The Lancet. Planetary Health*, Vol. 8 No. 3, pp. e197-e212.

Jenkins, E.L., Legrand, S., Brennan, L., Molenaar, A., Reid, M. and McCaffrey, T.A. (2021), "Psycho-behavioural segmentation in food and nutrition: a systematic scoping review of the literature", *Nutrients*, Vol. 13 No. 6, pp. 1-16, doi: 10.3390/nu13061795.

Kaiser, H.F. and Rice, J. (1974), "Little jiffy, mark IV", *Educational and Psychological Measurement*, Vol. 34 No. 1, pp. 111-117.

Kitunen, A., Carins, J. and Rundle-Thiele, S. (2025), "A socio-ecological lens to segmenting adult's eating behaviour", *Nutrition and Health*, doi: 10.1177/02601060251319181.

Kitunen, A., Rundle-Thiele, S. and Carins, J. (2019a), "Segmenting young adult university student's eating behaviour: a theory-informed approach", *Nutrients*, Vol. 11 No. 11, p. 2793, doi: 10.3390/nu11112793.

Kitunen, A., Rundle-Thiele, S., Kadir, M., Badejo, A., Zdanowicz, G. and Price, M. (2019b), "Learning what our target audiences think and do: extending segmentation to all four bases", *BMC Public Health*, Vol. 19 No. 1, pp. 1-10, doi: 10.1186/s12889-019-6696-2.

Klapp, A.-L., Wyma, N., Alessandrini, R., Ndinda, C., Perez-Cueto, A. and Risius, A. (2025), "Recommendations to address the shortfalls of the EAT–lancet planetary health diet from a plant-forward perspective", *The Lancet Planetary Health*, Vol. 9 No. 1, pp. e23-e33, doi: 10.1016/S2542-5196(24)00305-X.

Koksal, M.H. (2019), "Food choice motives for consumers in Lebanon: a descriptive study", *British Food Journal*, Vol. 121 No. 11, pp. 2607-2619, doi: 10.1108/BFJ-09-2018-0580.

Kovács, I., Lendvai, M.B. and Beke, J. (2022), "The importance of food attributes and motivational factors for purchasing local food products: segmentation of young local food consumers in Hungary", *Sustainability* (Switzerland), Vol. 14 No. 6, p. 3224, doi: 10.3390/su14063224.

Kubacki, K., Rundle-Thiele, S., Pang, B., Carins, J., Parkinson, J., Fujihira, H. and Ronto, R. (2017), "An umbrella review of the use of segmentation in social marketing interventions", *Segmentation in Social Marketing: Process, Methods and Application*, pp. 9-23.

Lara, J., McCrum, L.A. and Mathers, J.C. (2014), "Association of mediterranean diet and other health behaviours with barriers to healthy eating and perceived health among British adults of retirement age", *Maturitas*, Vol. 79 No. 3, pp. 292-298, doi: 10.1016/j.maturitas.2014.07.003.

Lazzarini, G.A., Visschers, V.H.M. and Siegrist, M. (2018), "How to improve consumers' environmental sustainability judgements of foods", *Journal of Cleaner Production*, Vol. 198, pp. 564-574, doi: 10.1016/j.jclepro.2018.07.033.

Lazzarini, G.A., Zimmermann, J., Visschers, V.H.M. and Siegrist, M. (2016), "Does environmental friendliness equal healthiness? Swiss consumers' perception of protein products", *Appetite*, Vol. 105, pp. 663-673, doi: 10.1016/j.appet.2016.06.038.

Leventon, J., Abson, D.J. and Lang, D.J. (2021), "Leverage points for sustainability transformations: nine guiding questions for sustainability science and practice", *Sustainability Science*, Vol. 16 No. 3, pp. 721-726, doi: 10.1007/s11625-021-00961-8.

Li, R. and Roe, B.E. (2024), "Segmenting U.S. consumers by food waste attitudes and behaviors: opportunities for targeting reduction interventions", *Sustainable Production and Consumption*, Vol. 45, pp. 348-358, doi: 10.1016/j.spc.2024.01.015.

Liu, W., Cao, M. and Florkowski, W.J. (2023), "The impact of regional COVID-19 outbreak on consumers' risk perception of purchasing food online", *Healthcare* (Switzerland), Vol. 11 No. 11, p. 1571, doi: 10.3390/healthcare11111571.

Lynes, J. and Wolfe, S. (2017), "It's time to rethink our messaging about environmental change", pp. 1-8.

McKay, A.D.I., Lade, S.J., Smith, S.R., Zimm, C.B.E., Lenton, T.M., McKay, A.D., Loriani, S., Abrams, J., Lade, S., Donges, J., Milkoreit, M., Powell, T., Smith, S., Zimm, C., Buxton, J., Bailey, E., Laybourn, L., Ghadiali, A., Dyke, J., McKay, A., Loriani, S., Abrams, J.F., Donges, J.F., and Buxton, J.E. (2023), *The Global Tipping Points Report 2023*, Exeter, UK.

McDonagh, P. and Prothero, A. (2014), "Sustainability marketing research: past, present and future", *Journal of Marketing Management*, *2014*, Vol. 30 Nos 11-12, pp. 1186-1219.

McKenzie-Mohr, D. (2024), *Fostering Sustainable Behavior: An Introduction to Community-Based Social Marketing*, 3rd ed., New society publishers.

Maller, C.J. (2015), "Understanding health through social practices: performance and materiality in everyday life", *Sociology of Health & Illness*, Vol. 37 No. 1, pp. 52-66, doi: 10.1111/1467-9566.12178.

Markovina, J., Stewart-Knox, B.J., Rankin, A., Gibney, M., de Almeida, M.D.V., Fischer, A., Kuznesof, S.A., Poínhos, R., Panzone, L. and Frewer, L.J. (2015), "Food4Me study: validity and reliability of food choice questionnaire in 9 European countries", *Food Quality and Preference*, Vol. 45, pp. 26-32, doi: 10.1016/j.foodqual.2015.05.002.

Marquis, M., Talbot, A., Sabourin, A. and Riopel, C. (2019), "Exploring the environmental, personal and behavioural factors as determinants for university students' food behaviour", *International Journal of Consumer Studies*, Vol. 43 No. 1, pp. 113-122, doi: 10.1111/ijcs.12490.

Mertens, E., Sagastume, D., Sorić, T., Brodić, I., Dolanc, I., Jonjić, A., Delale, E.A., Mavar, M., Missoni, S., Čoklo, M. and Peñalvo, J.L. (2022), "Food choice motives and COVID-19 in Belgium", *Foods*, Vol. 11 No. 6, p. 842, doi: 10.3390/foods11060842.

Michie, S., van Stralen, M.M. and West, R. (2011), "The behaviour change wheel: a new method for characterising and designing behaviour change interventions", *Implementation Science*, Vol. 6 No. 1, p. 42, doi: 10.1186/1748-5908-6-42.

Milošević, J., Žeželj, I., Gorton, M. and Barjolle, D. (2012), "Understanding the motives for food choice in Western Balkan countries", *Appetite*, Vol. 58 No. 1, pp. 205-214, doi: 10.1016/j.appet.2011.09.012.

Mintel Group Ltd (2017), "Two in three Canadians agree eating healthy positively impacts emotional well-being", [WWW Document].

Mollaei, S., Minaker, L.M., Lynes, J.K. and Dias, G.M. (2023), "Perceptions and determinants of adopting sustainable eating behaviours among university students in Canada: a qualitative study using focus group discussions", *International Journal of Sustainability in Higher Education*, Vol. 24 No. 9, pp. 252-298.

Mollaei, S., Minaker, L.M., Robinson, D.T., Lynes, J.K. and Dias, G.M. (2022), "Including sustainability factors in the derivation of eater profiles of young adults in Canada", *British Food Journal*, doi: 10.1108/BFJ-06-2022-0476.

Montero-Vicente, L., Roig-Merino, B., Buitrago-Vera, J. and Sigalat-Signes, E. (2019), "Characterisation of fresh fruit consumption in Spain based on food-related lifestyle", *British Food Journal*, Vol. 121 No. 12, pp. 3307-3320, doi: 10.1108/BFJ-04-2019-0253.

National Cancer Institute (NCI) (2020), "Fab study: food attitudes and behaviors survey ", [WWW Document], available at: https://cancercontrol.cancer.gov/sites/default/files/2020-06/fab_main_annotated.pdf

Naughton, P., McCarthy, M. and McCarthy, S. (2017), "Reducing consumption of confectionery foods: a post-hoc segmentation analysis using a social cognition approach", *Appetite*, Vol. 117, pp. 168-178, doi: 10.1016/j.appet.2017.06.027.

Olstad, D.L. and Kirkpatrick, S.I. (2021), "Planting seeds of change: reconceptualizing what people eat as eating practices and patterns", *International Journal of Behavioral Nutrition and Physical Activity*, Vol. 18 No. 1, p. 32. doi: 10.1186/s12966-021-01102-1.

Park, J., Bonn, M.A. and Cho, M. (2020), "Sustainable and religion food consumer segmentation: focusing on Korean temple food restaurants", *Sustainability* (Switzerland), Vol. 12 No. 7, p. 3035, doi: 10.3390/su12073035.

Piracci, G., Casini, L., Contini, C., Stancu, C.M. and Lähteenmäki, L. (2023), "Identifying key attributes in sustainable food choices: an analysis using the food values framework", *Journal of Cleaner Production*, Vol. 416, p. 137924, doi: 10.1016/j.jclepro.2023.137924.

Poore, J. and Nemecek, T. (2018), "Reducing food's environmental impacts through producers and consumers", *Science (1979)*, Vol. 360 No. 6392, pp. 987-992, doi: 10.1126/science.aaq0216.

Pula, K., Parks, C.D. and Ross, C.F. (2014), "Regulatory focus and food choice motives. Prevention orientation associated with mood, convenience, and familiarity", *Appetite*, Vol. 78, pp. 15-22, doi: 10.1016/j.appet.2014.02.015.

Puspitasari, N.B., Pramono, S.N.W., Rinawati, D.I. and Fidiyanti, F. (2020), "Online consumer segmentation study based on factors affecting E-Commerce selection", *IOP Conference Series: Materials Science and Engineering*, Institute of Physics Publishing Vol. 722 No. 1, p. 012036, doi: 10.1088/1757-899X/722/1/012036.

Rakib, M.A.N., Chang, H.J.J., and Jones, R.P. (2022), "Effective sustainability messages triggering consumer emotion and action: an application of the social cognitive theory and the Dual-Process model", *Sustainability* (Switzerland), Vol. 14, p. 2505, doi: 10.3390/su14052505.

Reisch, L., Eberle, S. and Lorek, S. (2013), "The food system: the interlinkages between production and consumption major impacts and trends on the production side", *Sustainability: Science, Practice, & Policy*, Vol. 9, pp. 9-25.

Rejman, K., Kaczorowska, J., Halicka, E. and Laskowski, W. (2019), "Do Europeans consider sustainability when making food choices? A survey of polish city-dwellers", *Public Health Nutrition*, Vol. 22 No. 7, pp. 1330-1339, doi: 10.1017/S1368980019000326.

Saba, A., Sinesio, F., Moneta, E., Dinnella, C., Laureati, M., Torri, L., Peparaio, M., Saggia Civitelli, E., Endrizzi, I., Gasperi, F., Bendini, A., Gallina Toschi, T., Predieri, S., Abbà, S., Bailetti, L., Proserpio, C. and Spinelli, S. (2019), "Measuring consumers attitudes towards health and taste and their association with food-related life-styles and preferences", *Food Quality and Preference*, Vol. 73, pp. 25-37, doi: 10.1016/j.foodqual.2018.11.017.

Sample, C.H., Martin, A.A., Jones, S., Hargrave, S.L. and Davidson, T.L. (2015), "Western-style diet impairs stimulus control by food deprivation state cues: implications for obesogenic environments", *Appetite*, Vol. 93, pp. 13-23, doi: 10.1016/j.appet.2015.05.018.

Santos, R.D.O., Gorgulho, B.M., Castro, M.A.D., Fisberg, R.M., Marchioni, D.M. and Baltar, V.T. (2019), "Principal component analysis and factor analysis: differences and similarities in nutritional epidemiology application", *Revista Brasileira de Epidemiologia*, Vol. 22, pp. 1-14, doi: 10.1590/1980-549720190041.

Scherme, A., Mendoza, J., Henson, S., Dukeshire, S., Pasut, L., Emrich, T.E., Lou, W., Qi, Y. and L'Abbé, M.R. (2014), "Canadians' perceptions of food, diet, and health – A national survey", *PLoS One*, Vol. 9, p. e86000, doi: 10.1371/journal.pone.0086000.

Schnettler, B., Grunert, K.G., Miranda-Zapata, E., Orellana, L., Sepúlveda, J., Lobos, G., Hueche, C. and Höger, Y. (2017a), "Testing the abbreviated food technology neophobia scale and its relation to satisfaction with food-related life in university students", *Food Research International*, Vol. 96, pp. 198-205, doi: 10.1016/j.foodres.2017.04.003.

Schnettler, B., Höger, Y., Orellana, L., Miranda, H., Lobos, G., Sepúlveda, J., Sanchez, M., Miranda-Zapata, E., Denegri, M., Grunert, K.G. and Salinas-Oñate, N. (2017b), "Food neophobia, life satisfaction and family eating habits in university students", *Cadernos de Saúde Pública*, Vol. 33 No. 3, p. e00165615, doi: 10.1590/0102-311X00165615.

Schunk, D.H. and DiBenedetto, M.K. (2020), "Motivation and social cognitive theory", *Contemporary Educational Psychology*, Vol. 60, p. 101832, doi: 10.1016/j.cedpsych.2019.101832.

Sharma, A.P. (2021), "Consumers' purchase behaviour and green marketing: a synthesis, review and agenda", *International Journal of Consumer Studies*, Vol. 45 No. 6, pp. 1217-1238, doi: 10.1111/ijcs.12722.

Simunaniemi, A.M., Nydahl, M. and Andersson, A. (2013), "Cluster analysis of fruit and vegetable-related perceptions: an alternative approach of consumer segmentation", *Journal of Human Nutrition and Dietetics*, Vol. 26 No. 1, pp. 38-47, doi: 10.1111/j.1365-277X.2012.01272.x.

Skalkos, D. and Kalyva, Z.C. (2023), "Exploring the impact of COVID-19 pandemic on food choice motives: a systematic review", *Sustainability* (Switzerland), Vol. 15 No. 2, p. 1606, doi: 10.3390/su15021606.

Słupik, S., Kos-Łabędowicz, J. and Trzęsiok, J. (2021), "Are you a typical energy consumer? Socioeconomic characteristics of behavioural segmentation representatives of 8 European countries", *Energies (Basel)*, Vol. 14 No. 19, p. 6109.

Statistics Canada (2020), "Population estimates, quarterly", [WWW Document]. URL, available at: www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid= (accessed 31 January 2021).

Statistics Canada (2022a), "Population growth in Canada's rural areas", 2016 to 2021 [WWW Document]. Analytical products, 2021 Census, available at: www12.statcan.gc.ca/census-recensement/2021/as-sa/98-200-x/2021002/98-200-x2021002-eng.cfm (accessed 11 August 2024).

Statistics Canada (2022b), Table 98-10-0386-01 Highest level of education by geography: Canada, provinces and territories [WWW Document]. Statistics Canada., doi:10.25318/9810038601-eng.

Statistics Canada (2024), "Average total income of families by province and territory", 2018 to 2022 [WWW Document]. Statistics Canada, available at: www150.statcan.gc.ca/n1/daily-quotidien/240627/t001g-eng.htm (accessed 11 August 2024).

Statistics Canada (2023), "Census of population. Statistics Canada catalogue no. 98-316-X2021001 ", [WWW Document]. Census Profile, available at: www12.statcan.gc.ca/census-recensement/2021/dp-pd/prof/details/page.cfm?LANG=E&GENDERlist=1,2,3&STATISTIClist=4&HEADERlist=23&SearchText=Canada&DGUIDlist=2021A000011124 (accessed 11 August 2024).

TheNielsenCompany, L. (2017), "Healthyhabitsmakehealthy Canadians", [WWW Document], available at: www.nielsen.com/ca/en/insights/news/ 2017/healthy-habits-make-healthy-canadians.html

Tirion, A.S.C., D'Lima, D., Terlet, J., Rao, R. and Gutman, L. M. (2025), "Identifying behaviour change techniques for sustainable food consumption: a systematic review using the BCTTv1", *Appetite*, Vol. 214, p. 108057, doi: 10.1016/j.appet.2025.108057.

Van de Mortel, T.F. (2008), "Faking it: social desirability response bias in self-report research", *Australian Journal of Advanced Nursing*, Vol. 4, pp. 40-48.

Vázquez-Rowe, I., Larrea-Gallegos, G., Villanueva-Rey, P. and Gilardino, A. (2017), "Climate change mitigation opportunities based on carbon footprint estimates of dietary patterns in Peru", *Plos One*, Vol. 12 No. 11, p. e0188182, doi: 10.1371/journal.pone.0188182.

Verain, M.C.D., Sijtsema, S.J. and Antonides, G. (2016), "Consumer segmentation based on food-category attribute importance: the relation with healthiness and sustainability perceptions", *Food Quality and Preference*, Vol. 48, pp. 99-106, doi: 10.1016/j.foodqual.2015.08.012.

Vergeer, L., Vanderlee, L., White, C.M., Rynard, V.L. and Hammond, D. (2020), "Vegetarianism and other eating practices among youth and young adults in major Canadian cities", *Public Health Nutrition*, Vol. 23 No. 4, pp. 609-619, doi: 10.1017/S136898001900288X.

Veselovská, L. (2023), "When fear is a factor: consumer behavior changes during the pandemic", *Journal of Business & Retail Management Research*, Vol. 18, pp. 41-48, doi: 10.24052/JBRMR/V18IS01/ART-04.

Visschers, V.H.M., Hartmann, C., Leins-Hess, R., Dohle, S. and Siegrist, M. (2013), "A consumer segmentation of nutrition information use and its relation to food consumption behaviour", *Food Policy*, Vol. 42, pp. 71-80, doi: 10.1016/j.foodpol.2013.07.003.

Visschers, V.H.M. and Siegrist, M. (2015), "Does better for the environment mean less tasty? Offering more climate-friendly meals is good for the environment and customer satisfaction", *Appetite*, Vol. 95, pp. 475-483, doi: 10.1016/j.appet.2015.08.013.

Wetherill, M.S., Williams, M.B., Hartwell, M.L., Salvatore, A. L., Jacob, T., Cannady, T.K., Standridge, J., Fox, J., Spiegel, J., Anderson, N. and Jernigan, V.B.B. (2018), "Food choice considerations among American Indians living in rural Oklahoma: the THRIVE study", *Appetite*, Vol. 128, pp. 14-20, doi: 10.1016/j.appet.2018.05.019.

Willett, W., Rockström, J., Loken, B., Springmann, M., Lang, T., Vermeulen, S., Garnett, T., Tilman, D., DeClerck, F., Wood, A., Jonell, M., Clark, M., Gordon, L.J., Fanzo, J., Hawkes, C., Zurayk, R., Rivera, J.A., De Vries, W., Majele Sibanda, L., Afshin, A., Chaudhary, A., Herrero, M., Agustina, R., Branca, F., Lartey, A., Fan, S., Crona, B., Fox, E., Bignet, V., Troell, M., Lindahl, T., Singh, S., Cornell, S. E., Srinath Reddy, K., Narain, S., Nishtar, S. and Murray, C.J.L. (2019), "Food in the Anthropocene: the EAT–lancet commission on healthy diets from sustainable food systems", *The Lancet*, Vol. 393 No. 10170, pp. 447-492, doi: 10.1016/S0140-6736(18)31788-4.

Yilmazsoy, B., Schmidbauer, H. and Rösch, A. (2015), "Green segmentation: a cross-national study", *Marketing Intelligence & Planning*, Vol. 33 No. 7, pp. 981-1003, doi: 10.1108/MIP-12-2013-0201.

Yue, M., Jin, S., Tindale, S., Vicario-Modroño, V., Sánchez-Zamora, P., Gallardo-Cobos, R., Newell-Price, P. and Frewer, L.J. (2024), "Segmenting consumers of meat and dairy products from five European countries: implications for promoting sustainable food choices", *Sustainable Production and Consumption*, Vol. 47, pp. 47-58, doi: 10.1016/j.spc.2024.03.034.

Supplementary material

The supplementary material for this article can be found online.

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