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Understanding Green Food Consumption Behaviour
A Literature Review

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Abstract

Food consumption is one of the most significant contributors to global environmental problems, being responsible for a large share of greenhouse gas emissions, water scarcity, and soil pollution, among other issues. The demand for unsustainable food contributes to the food sector's environmental burden: hence, there has been a surge in research into green food consumption in the last ten years. Nevertheless, our understanding of green food purchasing behaviour is rather rudimentary and a comprehensive view is needed. The current study therefore aims to understand green food purchasing behaviour by means of a literature review approach. The study explored and analysed relevant theories and determinants explaining green food purchasing behaviour. It also scanned the literature for research suggestions which authors indicated might improve future studies. The current review applied key term searches on the "Web of Science" database to find relevant literature. The search results found 69 articles published between 2015 and 2021 in peer-reviewed English-language journals. The findings include important descriptive bibliographical analysis and patterns and trends in green food consumption. Categories of determinants explaining green food purchasing behaviour have also been identified. The review summarises the suggestions given by scholars in the literature to help future researchers seeking improvement.

Keywords

green food, purchase behaviour, literature review, drivers of green food purchase

1 Introduction

Food is a vital part of everyday life. However, our food system is one of the main contributors to global problems such as the loss of biodiversity, water scarcity, environmental degradation, climate change, social issues (Garnett, 2013), and health-related challenges (Clark et al., 2020). One approach towards addressing the issue involves looking at consumers' decisions relating to food and attempting to shift their preferences towards more environmentally friendly or green food. The study of Kőszeghy (2004) indicates that consumer demand for sustainable products also plays role in shaping firms' greenness. For example, meal choices involving more plant-based food can lower greenhouse gas emissions and mitigate environmental and social challenges (Liu et al., 2012).

Environmentally conscious or green consumption can be described as consumer decisions involving the purchase, consumption, and disposal of products that produce less pollution (or are less damaging to the environment and society) without affecting the quantity and quality of consumption (Liobikienė and Bernatonienė, 2017). The concept of green food consumption underlines the importance of consumers' ethics (Salam et al., 2022) and concern over the natural environment while making purchasing decisions (Witek and Kuźniar, 2021) has given rise to a new consumer market (Zimon et al., 2020). A proper understanding of green food purchasing behaviour is vital, as it differs from conventional purchasing decisions. As a result, many marketing, psychology, and environmental sciences studies have highlighted a shift in green consumption patterns (Testa et al., 2021). Earlier studies have analysed various factors with a view to predicting green purchasing behaviour (Liobikienė and Bernatonienė, 2017). These studies examined the matter through the lens of broader behavioural theories, examining empirical evidence with a view to identifying underlying factors affecting consumer purchasing decisions (Stern et al., 1999; Testa et al., 2021; Zepeda and Deal, 2009).

The rationale for conducting the current review is twofold. First, a growing number of articles from

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various disciplines have investigated green food purchasing behaviour, but we still lack a comprehensive understanding of individual-level motivations and barriers. Thus, a review of determining factors is required, with the help of the relevant theories. Second, despite significant attention from academia and practitioners regarding green consumption, and an increasing number of consumers showing environmental concern towards green products, actual consumption patterns remain contradictory (Csutora, 2012; ElHaffar et al., 2020). This also prompts a review and analysis of the literature.

This study aims to contribute to the literature in various ways. First, only limited studies have reviewed the literature on green food purchasing behaviour, and the existing literature has centred around green purchasing behaviour in general (Groening et al., 2018; Joshi and Rahman, 2015; Zhang and Dong, 2020) or specific types of green food (Hemmerling et al., 2015; Kushwah et al., 2019). The current research therefore covers both general and specific green food consumption patterns, providing an overview of the studies' trends and focus. Second, no comprehensive research has described how the various theoretical frameworks on green food consumption behaviours may be applied; thus, the current review explains both the relevant theories and their applications. Third, we aimed to explore drivers and barriers within the context of theories that determine consumption behaviour, and the study attempts to categorise the factors that help managers and policymakers analyse the determinants of green food behaviour more systematically. Fourth, the study will summarise research limitations proposed in the selected literature.

Initially, the paper outlines the methodology used to analyse the literature. Next, it describes and analyses the literature. Finally, the findings and conclusions are discussed.

2 Methodology

The current literature review was conducted applying the literature review methodology suggested by Xiao and Watson (2019). The present study followed seven steps (Oliver et al., 2005; Testa et al., 2021):

1. formulating research questions,
2. developing the review protocol,
3. searching the literature,
4. screening and inclusion of literature,
5. extracting the data,
6. analysing and synthesising the data, and
7. reporting the review findings.

2.1 Formulating research questions

Based on the need to better understand green food purchase behaviour as identified above, the current study aims to answer three research questions:

1. What are the theories used in the green food purchasing behaviour literature?
2. What antecedents or variables within identified theories have significantly affected green food purchasing behaviour?
3. What research limitations have been highlighted in the existing literature, and what potential directions are available for future research?

2.2 Developing the review protocol

Based on the research questions established, the study considered the inclusion criteria given in Table 1. First, since the initial analysis of the search results of key terms showed that the majority of studies had been published in recent years, the study evaluated relevant literature published from 2015 to 2021 in the Web of Science database. WoS is the world's leading widely used, and authoritative citation database in the scientific community with the number of highest impact factor journals. Hence, the current study selected the database (Li et al., 2018). In terms of coverage depth from a citation point of view, the WoS is generally regarded as better than other leading databases (Pranckutė, 2021). Second, the study aimed to analyse the purchasing phase within the complex process of green food consumption. Third, the review included only scientific articles published in peer-reviewed journals in English. Fourth, the study aimed to address consumers' purchasing behaviour and to explore factors that affect consumer behaviour. Hence, the review includes publications focused on consumers as the sole subject of the research. Publications that pertain to books, review articles, and conference proceedings have been excluded from the review. Moreover, articles discussing green purchases from stakeholders' points of view other than consumers were also excluded.

Table 1 Inclusion criteria for articles selection

Inclusion criteria
Published between 2015 and 2021
Published in peer-reviewed journals
Language: English
Empirical in nature
Conducted on consumers only
Based on a relevant theory, theoretical structure, or framework
Focused on purchase behaviour, intention, attitude, or other appropriate buying behaviour

Source: W. Mazhar

2.3 Literature search

The current review used a set of keywords to search for relevant scholarly work from diverse research areas to avoid missing out on relevant research (Wanden-Berghe and Sanz-Valero, 2012). The key terms in the database search were based on scholarly works of Liobikienė and Bernatonienė (2017) and Testa et al. (2021). These key terms are separated by Boolean operators "AND" and "OR". As a result, the following search was undertaken: "Green food" OR "Sustainable food" OR "environmentally friendly food" OR "Eco-friendly food" OR "Organic food" AND Purchase* OR Buy* OR Consumption OR Consume* OR Behaviour OR Willingness OR Intention.

2.4 Screening and inclusion of the literature

The results of the WoS database search using these keywords are presented in Table 2. Step 2 consisted of examining these articles' titles, abstracts, and conclusions to identify relevant studies. During this step, several articles were excluded focusing on food procurement, food production and systems, diet, health, nutrition, lifecycle assessment, food waste, food safety, and general environmental behaviour. Excluding these articles has left 80 relevant articles in the database. A closer examination of these articles revealed that 11 articles did not apply or mention any theoretical frameworks. Thus finally, 69 articles were selected for the current review.

2.5 Extracting the data

The authors developed a Microsoft Excel spreadsheet for storing and summarising the data. The spreadsheet recorded publication data such as authors, title, abstract, theories used, year of publication, geographical coverage, type of green food product, research participants, type of research, data collection methods, underlying hypothesis, the conceptual model, list of independent, mediating, moderating and dependent variables, method of data analysis, findings, and future suggestions/limitations of the studies.

Table 2 Database search and scanning results

Steps	Search operations	Search results
Step 1:	Keywords search	1684
Step 2:	Inclusion criteria: Year: 2015-2021 Language: English Publication stage: published Publication type: Peer-reviewed journals Based on any relevant theory or theoretical structure, or framework	1124
Step 3:	Scanning of title, abstract, and conclusions of articles	80
Step 4:	Assessing the full text of the articles	69

Source: W. Mazhar

2.6 Analysing and synthesising the data

The current study will present a descriptive analysis of the literature on green food consumption, showing the distribution of studies across the publication date, geography, and research area, followed by green food consumption themes categorising the literature. It will proceed to find and present the most common significant drivers of, and barriers to, green food consumption. The study will categorise these determinants and describe the number of articles in each category. Moreover, the study will classify the suggestions given by the authors for improving our understanding of green food consumption. We also list research limitations the authors acknowledged and considered helpful for future researchers. Finally, we identify overall research trends and present important aspects which may improve future research into green food consumption.

3 Descriptive analysis of the literature on green food consumption

The descriptive analysis of these studies is illustrated by geographical distribution, the number of publications each year, and publication titles. The summary of selected studies is presented in Table 3 and Fig. 1.

The articles selected for the current literature review were published in various journals. The most articles were published in journals associated with the Environmental science and ecology (30.4%) and Food science and technology (30.4%) research areas. Meanwhile, Sustainability (9), British Food Journal (8), Journal of Cleaner Production (5), and Appetite (5) proved to be the journals producing the highest number of publications on the topic (Table 3).

3.1 Major green food consumption patterns

Since there are several ways of consuming green food, the current study classified the reviewed articles according to their specific pattern, based on effective eco-friendly food choices. For example, the study by Jungbluth et al. (2000) examined the environmental effect of food products from a lifecycle assessment perspective. It showed that effective eco-friendly food choices are taken to mean purchasing organic food, consuming less meat, preferring a plant-based diet, and avoiding products transported by air. Other studies describe green food consumption as avoiding excessive packaging and highly processed food

Table 3 Description of literature on green food consumption

Country	No. of studies	%	Titles	No. of studies	%
Geographical distribution of studies - countries[a]			Research areas (%) and journals (*n*)[b]		
China	9	11%	*Environmental sciences and ecology*		30.4%
Germany	9	11%	Sustainability	9	
Taiwan	7	9%	Journal of Cleaner Production	5	
Italy	5	6%	International Journal of Environmental Research and Public Health	3	
South Korea	5	6%	Others	4	
UK	5	6%	*Food science and technology*		30.4%
Australia	4	5%	British Food Journal	8	
Denmark	3	4%	Appetite	5	
Malaysia	3	4%	Food Quality and Preference	4	
Norway	3	4%	Foods	4	
Vietnam	3	4%	*Business and economics*		26.1%
Geographical distribution of studies - continents			International Journal of Consumer Studies	3	
Europe		43%	Journal of Food Products Marketing	3	
Asia		41.8%	Journal of Retailing and Consumer Services	2	
Australia and Oceana		7.6%	Other journals	10	
America		3.8%	*Social sciences, interdisciplinary*		4.3%
Africa		3.8%	*Other areas*		8.7%

[a] Some of the studies were conducted in more than one country, [b] Only journals with at least 3 publications are presented here
Source: W. Mazhar

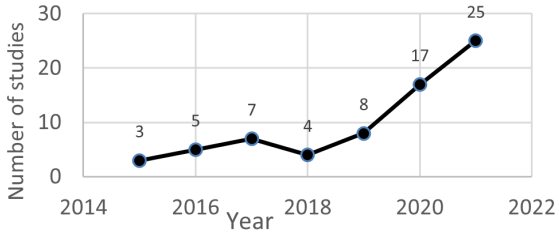

Fig. 1 Number of studies per year (Source: W. Mazhar)

(Jungbluth et al., 2000; Tobler et al., 2011) or eating seasonal and regional food (Niva et al., 2014; Tobler et al., 2011). Meanwhile, Loebnitz et al. (2015) considered the purchase of oddly shaped fruits and vegetables to be an environmental option.

The current study adopted six distinct themes and categorised selected articles within these themes, as presented in Fig. 2. Most studies are conducted on general green food consumption (31 articles) followed by studies on organic food (17) and reducing meat and an increasingly plant-based sustainable diet (9). However, a few studies focused on less packaging and less processed food (2) and purchasing food with aesthetic deficiency or short expiry or resale of excessive food (3).

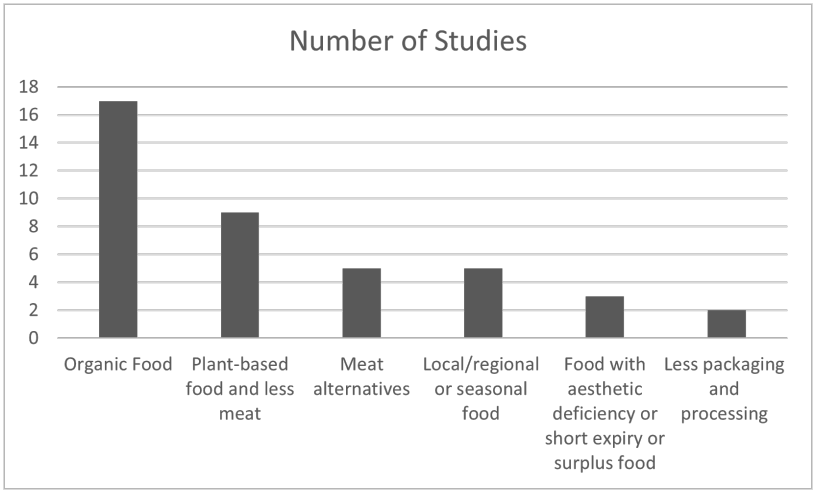

Fig. 2 Green food consumption patterns and number of studies (Source: W. Mazhar)

4 Theories used in green food behaviour literature

The study revealed thirty-two distinct theories adopted in the research frameworks. The sample of theories is presented in Table 4, which includes a list of theories applied most frequently in the literature. The theory of planned behaviour (TPB) (43.5%) is most often applied, followed by practice theories or social practice theory (13%).

4.1 Overview and applications of theories

The literature on green food consumption has covered numerous theories and frameworks. Here, we sought the description of most frequent theories and aimed to summarise them for our knowledge. The summary of the results is presented in Table 5.

5 Determinants of green food purchase behaviour

In the literature, we found two dependent variables that are most often analysed – purchase intention and purchase behaviour. Therefore, the current review has taken both dependent variables into consideration and analysed them separately. Moreover, the current study has classified determinants into six dimensions, as presented in Table 6. The first column of Table 6 indicates the dimensions of the determinants. The second column of Table 6 is the number of factors in each dimension. The last column gives the number of articles that measured any factors related to the dimension. The second and third columns are further divided as intention and behaviour to describe dimensions separately for both dependent variables. We found more than 200 variables affecting or related to the dependent variables. While it is not possible to list all drivers and barriers of behaviour, Table 7 highlights the determinants that have been measured in more than one study.

Each section in Table 7 has five columns. The second column presents independent variables. The third column mentions the determinant type, the fourth column indicates the direction of the relationship between variables, and the fifth column counts the number of studies measuring the relationship. Referring to column 4, the sign "(+)" is interpreted as a positive relationship between independent and dependent variables, where these independent variables are called drivers. The "(−)" sign reveals a negative relationship or barriers to the dependent variable. Besides, the "(NS)" shows a statistically not significant relationship.

Table 4 Description of green food behaviour studies according to adopted theories

Theories	No. of studies	%
Theory of planned behaviour	30	43.5%
Practice theories	9	13.0%
Value-attitude-behaviour (VAB) theory	3	4.3%
Campbell's paradigm	2	2.9%
Nudging - behavioural intervention	2	2.9%
Social cognition theory	2	2.9%
Theory of consumption values	2	2.9%
Diffusion of innovation theory	2	2.9%

Source: W. Mazhar

5.1 Intrapersonal dimension

The intrapersonal dimension covers internal psychological consumer factors such as attitude, values, beliefs, concern, health consciousness, and others that affect consumer decision making. The review has identified 21 factors affecting purchase intention examined in 33 out of 69 articles. There are 33 relevant factors determining consumption behaviours in 14 out of 69 studies.

As shown in Table 7, attitude is the most frequent factor identified in green food consumption studies. Moreover, environmental concerns and health consciousness are other frequent intrapersonal factors affecting intention. Further observation found that environmental knowledge is not a significant determinant of intention in three out of four studies (He et al., 2019; Yogananda and Nair, 2019; Zarei and Maleki, 2018). According to Ajzen (1991), "attitude toward the behaviour refers to the degree to which a person has a favourable or unfavourable evaluation or appraisal of the behaviour in question". The relationship is found in multiple contexts, such as the purchase of organic food (Latip et al., 2021), meat reduction, and vegetable consumption (Graham and Abrahamse, 2017), preference for local food (Bavorova et al., 2018), less processed food (Stranieri et al., 2017), meat alternatives (Hwang and J.-J. Kim, 2021), and general green food studies (Woo and Kim, 2019). After attitude, environmental concern seems to be another factor determining green food purchase intention. According to Chang et al. (2021), environmental concern leads to the intention to purchase pre-cooked plant-based food. Similarly, the results of Shen and Chen's (2020) study revealed environmental concern is significantly associated with the purchase intention of meat alternatives. Moreover, health concern also determines green food purchase intention (Qi and Ploeger, 2021b).

Moving on to other dependent variables influencing behaviour, attitude is often examined as an intrapersonal factor in the literature, followed by pro-environmental self-identity and health motives. The study of Trentinaglia

Table 5 Theories used in the literature

Theory	Definition	Applications in the literature
Theory of planned behaviour (TPB)	The theory is based on the rational choice model according to the theory the Behaviour is followed by the intention to act (Ajzen, 1991).	1. Reducing meat consumption intention (Chen, 2022). 2. Green food (Qi and Ploeger, 2021b). 3. Edible insects (Hwang and H. Kim, 2021). 4. Sustainable food (Alagarsamy et al., 2021).
	(Bavorova et al., 2018; Chen, 2020; 2022; Eichhorn and Meixner, 2020; Elhoushy, 2020; Godfrey and Feng, 2017; Ham et al., 2015; Hansmann et al., 2020; Hwang and J.-J. Kim, 2021; Johe and Bhullar, 2016; Kim et al., 2016; Latip et al., 2021; Lentz et al., 2018; Minbashrazgah et al., 2017; Nguyen et al., 2021; Prince and Saira Wahid, 2020; Pucci et al., 2022; Shen and Chen, 2020; Stranieri et al., 2017; Ukenna and Ayodele, 2019; Vassallo et al., 2016; Wang and Wang, 2016; Weber et al., 2020; Yogananda and Nair, 2019)	
Practice theory	It is an approach to studying sociological consumption and adopts an approach beyond the focus on individual or society dualism. Rather, it places "practices" in the centre as a fundamental building block of social analysis (Reckwitz, 2002).	1. Selling surplus food to consumers to avoid food waste (Fuentes et al., 2021). 2. Dining in or eating out (Biermann and Rau, 2020). 3. Eating out (Pfeiffer et al., 2017).
	(Brons and Oosterveer, 2017; Fifita et al., 2020; Middha and Lewis, 2021; O'Kane and Pamphilon, 2020; O'Keefe et al., 2016)	
Campbell's paradigm	Attitude along with behavioural cost manifests in the behaviour. A positive attitude will be enhanced when an individual is also dealing with obstacles to performing the behaviour (Campbell, 1963; Kaiser et al., 2010).	1. Sustainable tomatoes (Baldi et al., 2021). 2. Sustainable apples in UK retail stores (Yamoah and Acquaye, 2019).
Value-attitude-behaviour (VAB) theory	According to the model, values affect behaviour, and attitude mediates that relationship (Homer and Kahle, 1988).	1. Pre-cooked green food (Chang et al., 2021). 2. Sustainable food (Olsen and Tuu, 2021).
Diffusion of innovation theory	The theory describes adopting innovation or new behaviour or ideas that integrate into social systems (Rogers, 2003).	1. Plant-based food and reduction of meat (Gonera et al., 2021). 2. Viral sustainable food content on social media (Choudhary et al., 2019).
Social cognition theory	The behaviour shift is determined by interacting reciprocal factors such as behaviour, personal, and environmental variables (Bandura, 2004).	1. Green aquatic products (Li and Zhong, 2017).
Theory of consumption values	The theory describes the consumer's assessment of gain and loss in the decision process. The theory illustrates five consumption values: functional, conditional, social, emotional, and Epistemic values (Sheth et al., 1991).	1. Organic food purchases (Cao et al., 2022). 2. The green food purchase (Woo and Kim, 2019).
Behavioural intervention - nudging	It is a behavioural intervention method based on the theory of dual process. The approach is also known as choice architecture. Without limiting consumer options, the intervention guides their decisions toward desired goals (Leonard, 2008).	1. The plant-based menu choices (Attwood et al., 2020). 2. Sustainable meal choices (Ohlhausen and Langen, 2020).

Source: W. Mazhar

Table 6 Dimensions of determinants

Dimensions of drivers and barriers	Number of factors in each dimension		Number of articles related to each dimension	
Dependent variables	Intention	Behavior	Intention	Behavior
Intrapersonal	21	18	33	14
Contextual	5	5	20	7
Personal skills and capabilities	5	3	16	4
Product and producer related	6	6	6	6
Behavioral	2	5	2	11
Sociodemographic	0	3	0	2

Source: W. Mazhar

De Daverio et al. (2021) shows that attitude is important in determining environmentally friendly food purchasing behaviour. Moreover, van der Werff et al. (2013) define pro-environmental self-identity as "the extent to which you see yourself as a type of person who acts environmental-friendly". The probability of purchasing green food is more apparent in consumers whose self-identity is congruent with environmental aspects (Wang and Wang, 2016). Furthermore, when the behaviour concerns reducing meat consumption, health is one of the motivating factors in executing the behaviour (Hielkema and Lund, 2021).

5.2 Contextual dimension

Contextual factors are based on the situation and environment during consumer decisions. Store physical environment cues, the influence of media and marketing promotions, social norms, economic benefit, availability, and the accessibility of the product may affect consumers during buying situations. If we observe Table 6, there are five

Table 7 Drivers and barriers of green food behaviour

No.	Independent variables	Category	Direction	No. of studies
		Dependent variable: intention		
1	Attitude	Intrapersonal factors	(+)	26
2	Perceived behavioural control	Personal skills and capabilities	(+)	14
3	Environmental concern	Intrapersonal factors	(+)	3
4	Health consciousness	Intrapersonal factors	(+)	3
5	Subjective norm	Contextual factor	(+), (NS)	9, 8
6	Consumption values	Product or producer related factor	(+)	3
7	Environmental awareness	Intrapersonal factors	(+)	2
8	Perceived consumer effectiveness	Personal skills and capabilities	(+)	2
9	Personal responsibilities	Intrapersonal factors	(+)	2
10	Personal norm	Contextual factor	(+)	2
11	Environmental / product knowledge	Intrapersonal factors	(+), (NS)	1, 3
12	Behavioural consistency attitude	Intrapersonal factors	(+)	1
13	Price / price consciousness	Product or producer related factor	(−)	3
		Dependent variable: behaviour		
1	Intention	Behavioural factor	(+)	9
2	Attitude	Intrapersonal factors	(+)	5
3	Past behaviour	Behavioural factor	(+)	3
4	Perceived behavioural control	Personal skills and capabilities	(+), (NS)	2, 2
5	Pro-environmental self-identity	Intrapersonal factors	(+)	2
6	Health motive	Intrapersonal factors	(+)	2
7	Perceived availability	Contextual factor	(+)	2

Source: W. Mazhar

contextual factors in 20 out of 69 studies that determine the intention to consume or buy green food. At the same time, five contextual factors were measured in 7 out of 69 studies examining consumption or buying behaviour.

Subjective norms and Personal Norm are the most frequent factors utilised in explaining the intention to purchase green food (Table 7). Subjective norms refer to the social aspect of the consumer decision-making process. The subjective norm is an individual perception that other people find a particular behaviour essential and should be adopted, and that perception influences one's decision (Ajzen, 1991). However, the relationship between subjective norm and intention is not straightforward in green food studies, as insignificant results are indicated (Elhoushy, 2020; Nguyen et al., 2021; Shen and Chen, 2020; Troudi and Bouyoucef, 2020) in eight studies (Table 7). We cannot say confidently that this factor is likely to influence purchase intention. However, further investigations are required to investigate subjective norms. Besides, in some studies, the subjective norm explains consumers' organic food purchase intentions (Latip et al., 2021), reducing meat consumption and increasing plant-based diet (Chen, 2022), and other green foods purchases (Kim et al., 2016; Weber et al., 2020).

5.3 Personal skills and capabilities dimension

The most relevant factor associated with the dimension is perceived behavioural control (PCB). The PCB is an individual's perception of the skills and abilities required to execute the behaviour (Ajzen, 1991). In other words, it can be seen as comprised of multiple components separately, such as resources to perform a behaviour, required skills, and abilities to implement a behaviour. The review identified five personal skills and capabilities factors in 16 out of 69 articles in behavioural intention studies. Moreover, there are three related factors in 4 studies explaining green food behaviours (Table 6).

Many studies have shown the positive relationships between perceived behavioural control and Perceived Consumer Effectiveness with purchase intention (Table 7). Perceived behaviour control is perceived consumers' abilities, available resources, opportunities, or skills that enhance the probability of executing the behaviour (Ajzen, 1991). According to Johe and Bhullar (2016), the intention to consume organic food is significantly determined by PBC. Similar results are also found in other behavioural intention studies on sustainable food (Kim et al., 2016), meat alternatives (Shen and Chen, 2020), and locally grown organic

food (Chen, 2020). In contrast, perceived consumer effectiveness is a similar term that defines consumers' feelings about the behaviour as positive or negative and perceives that their actions may produce some change or effects (Arvola et al., 2008). For example, the study of Alam et al. (2020) shows that perceived consumer effectiveness is positively related to consuming sustainable food.

5.4 Product and producer related dimension

The product and producer-related factors are attributes and characteristics of the product or brand. It covers price, quality, perceived consumption values in the product, product label or knowledge about green labelling, country of origin, perceived nutrition of the food, perceived naturalness of the product, food taste, food shape and size, and trust in the product or brand. The review has identified six such factors in 6 out of 69 studies related to each purchase intention and consumption behaviour (Table 6).

The findings indicate that consumption values and price are often factors in determining green food consumption or purchase intention (Table 7). The term "consumption values" refers to consumers' evaluation of products in terms of the benefits they can obtain, and the sacrifices they must make in acquiring the product or behaviour. Consumers assess functional, emotional, social, and other values in the product (Sheth et al., 1991). These values drive consumers to increase intention, whereas price acts as a barrier. Generally, green food is considered expensive compared to conventional food. The premium price is negatively related to purchase intention (Prince and Saira Wahid, 2020). Consumption values positively influence green consumption or purchase intentions (Alagarsamy et al., 2021; Alam et al., 2020). Similarly, consumption values also determine consumption or purchase behaviour. However, one study on sustainable consumption behaviour identified consumption values as a significant determinant and classified consumption values as emotion, functional, social, and epistemic. These values positively affect green food consumption (Cao et al., 2022).

5.5 Behavioural dimension

Behavioural factors include aspects related to actual behaviour, such as purchase frequency, purchase habit, past behaviour, and intention to behave. The findings show two factors in 2 out of 69 studies determining the intention. Furthermore, there are five factors in 11 out of 69 studies applied in measuring green food consumption behaviours (Table 6).

Analysing studies on behaviour intention, these factors are not found in more than one behavioural intention study. Thus, these factors may not be shown in Table 7. However, food shopping habits are considered the driver, and meat consumption habits are barriers to green food consumption intention. Habit refers to past behaviour repeated several times in the past and attributed to automaticity (Verplanken and Aarts, 1999). The study of Stranieri et al. (2017) revealed that consumers' food shopping habits are related to the intention of purchasing environmentally friendly convenience food. At the same time, the habit of eating meat is negatively related to the intention to reduce meat consumption and consume plant-based diets (Hielkema and Lund, 2021). Whereas intention and past behaviour are commonly investigated drivers of sustainable food consumption (Table 7). According to Vassallo et al. (2016), past satisfied behaviour and intention to purchase sustainable food motivates consumers to buy the product. Another study supported the relationship and identified intention as a significant antecedent of green chicken purchase behaviour (Minbashrazgah et al., 2017).

5.6 Sociodemographic dimension

The sociodemographic characteristics of consumers include age, gender, age, education, and income level. The study of Hansmann et al. (2020) recently confirmed that education and income levels predict organic food consumption. Similarly, another study revealed the positive relationship between higher income and environmentally friendly convenience food purchases. When considering gender, females are more inclined towards adopting green food consumption behaviour (Stranieri et al., 2017). The review has identified two studies that only address the demographic role in explaining green food consumption behaviour.

6 Exploring the literature for future research directions

This section presents frequent and vital suggestions by the authors of the articles reviewed to improve our understanding of green food consumption behaviour. The study found five types of suggestions, as presented in Table 8. It is found that incorporating additional variables in the theoretical frameworks and sampling design changes were the most frequent recommendations. The scholars have suggested extending the theoretical models by adding more intrapersonal and situational factors. Moreover, it is also advised to integrate multiple theories to enhance the models' predictability. The frequent recommendations on sampling design are related to devising systematic sampling methods and

Table 8 Future research directions categories and sources

Categories of recommendations	Source
Sampling methods and design	(Alagarsamy et al., 2021; Eichhorn and Meixner, 2020; Nguyen et al., 2019; 2021; Prince and Saira Wahid, 2020; Pucci et al., 2022; Qi and Ploeger, 2021a; Shen and Chen, 2020; Stranieri et al., 2017; Troudi and Bouyoucef, 2020; Ukenna and Ayodele, 2019; Weber et al., 2020; Woo and Kim, 2019; Xu et al., 2021; Yogananda and Nair, 2019; Zhang et al., 2020)
Data collection and research methods	(Alam et al., 2020; Attwood et al., 2020; Baldi et al., 2021; Cao et al., 2022; Chang et al., 2021; Chen, 2022; Hansmann et al., 2020; Latip et al., 2021; Lin, 2022; Olsen and Tuu, 2021; Salmivaara et al., 2021; Schäufele and Janssen, 2021; Stranieri et al., 2017; Vassallo et al., 2016; Wang et al., 2020; Zhang et al., 2020)
Contextual / cultural consideration	(Alam et al., 2020; Biermann and Rau, 2020; Fifita et al., 2020; Fuentes et al., 2021; Gonera et al., 2021; Jäger and Weber, 2020; Lentz et al., 2018; Nguyen et al., 2021; Nie et al., 2017; Ohlhausen and Langen, 2020; Possidónio et al., 2021; Qi and Ploeger, 2021a; Schäufele and Janssen, 2021; Vassallo et al., 2016; Wang and Wang, 2016; Xu et al., 2021; Zhang et al., 2020)
Additions of the variables in the model	(Alam et al., 2020; Cao et al., 2022; Chang et al., 2021; Eichhorn and Meixner, 2020; Gonera et al., 2021; Gustavsen and Hegnes, 2020; Ham et al., 2015; Hansmann et al., 2020; Hwang and J.-J. Kim, 2021; Lentz et al., 2018; Lin, 2022; Loebnitz et al., 2015; Nguyen et al., 2021; Ohlhausen and Langen, 2020; Olsen and Tuu, 2021; Possidónio et al., 2021; Qi and Ploeger, 2021a; Schäufele and Janssen, 2021; Shen and Chen, 2020; Vassallo et al., 2016)
Measurement of variables	(Bavorova et al., 2018; Chen, 2022; Eichhorn and Meixner, 2020; Ham et al., 2015; Hansmann et al., 2020; Hielkema and Lund, 2021; Kim et al., 2016; Pucci et al., 2022; Vassallo et al., 2016; Weber et al., 2020; Woo and Kim, 2019)

Source: W. Mazhar

using a sample more representative of the studied population. Analysis of the data collection and research category found that conducting experiments and mixed methods are important steps for researchers. Further suggestions include analysing green consumption behaviour in different consumption contexts, such in connection with a specific meal of the day, or differentiating behaviour when study participants are at home or dining out. Lastly, the effective way to measure the constructs of attitude and subjective would be to include multidimensional or second-order constructs. For example, the subjective norm can be measured by injunctive and descriptive norms.

7 Discussion and conclusion

Today, consumer food choices have become relevant to society, especially regarding health and environmental issues. Addressing these problems has gained significant attention and is discussed in policymaking, marketing, and international platforms (Miniero et al., 2014). This review can support decision-makers and policymakers in developing strategies at each stage of consumers' decision process. This review has summarised theories that show significant determinants. Moreover, the study also benefits academics and researchers by outlining the key suggestions and recommendations of scholars for improving future research in this area.

Studies into green food purchasing behaviour have been on the increase since 2015. This review has selected 69 articles published from 2015 to 2021 on the web of science database. The study bifurcated these studies into various consumption patterns and found that most studies consider general green food behaviours without respect for individual green food products, or else focus on organic food consumption. These studies have often been conducted in Asia and Europe. The countries with the highest number of studies are China and Germany. Mainly, these publications cover Environmental Science and Ecology, Food Science and Technology, and Business and Economics research areas.

Research question 1: What are relevant theories and their application in green food purchase behaviour literature?

The breadth of theories shows that the phenomena are examined from multiple perspectives. The current review findings show that theory of planned behaviour and practice theories are frequently applied as theoretical frameworks in green food consumption studies. Overall, theories incorporated intrapsychic factors, social, and contextual aspects in the model. Moreover, the review data also shows that the majority of studies have examined general green food purchasing behaviour, followed afterwards by organic food purchasing behaviour. If we observe consumption patterns and theory together, we can see that the theory of planned behaviour is applied in most consumption domains; however, it did not cover the domain of food with aesthetic deficiency or short expiry, or surplus food consumption. The social or social practice theory mainly focuses on sustainable or green consumption.

Research question 2: What antecedents or variables within identified theories have significantly affected green food purchase behaviour?

The review shows that studies do not solely focus on food purchase behaviour measurement, but that behavioural intention is also often considered as a dependent variable. The current review has classified these variables or determining factors into different categories such as interpersonal, contextual, personal capabilities, product or producer related, behavioural, and sociodemographic factors. It has been found that the largest number of factors are related to psychological or intrapersonal factors such as value, attitude, environmental concern, environmental awareness, health consciousness, etc. The subjective norms and perceived product availability are contextual factors commonly affecting determinants of dependent variables. Moreover, the perceived behaviour control is related to the personal skills, and the capability factor category is found to be common in determinants. The findings revealed that some drivers of green food consumption indicate mixed statistical significance levels. For example, "Subjective Norm" (Elhoushy, 2020; Shen and Chen, 2020; Troudi and Bouyoucef, 2020) and "Environmental Knowledge" (Hansmann et al., 2020; He et al., 2019; Zarei and Maleki, 2018) or "Product Knowledge" (Shen and Chen, 2020) have been often found statistically insignificant in the relationship. To enhance the consistency of the subjective norm results, Ham et al. (2015) recommends measuring two types of norms – descriptive and injunctive norms – separately in determining purchase intention.

Research question 3: What research limitations have been highlighted in the existing literature, and what potential directions are available for future research?

The study identified theoretical and methodological suggestions most frequent. First, theoretical suggestions direct us to integrate more than one theory (Alam et al., 2020) and measure the theoretical constructs with multi-items (Bavorova et al., 2018; Eichhorn and Meixner, 2020). The review of ElHaffar et al. (2020) also supports the view that future research should combine theories and include rational and behavioural paradigms. Moreover, scholars have repeatedly recommended using experiments (Cao et al., 2022; Lin, 2022; Salmivaara et al., 2021) and mixed methods (Latip et al., 2021; Vassallo et al., 2016; Zhang et al., 2020). The studies reviewed in the current study have often utilised the quantitative research method and show the positive and significant effect of attitude and intention on green food purchase behaviour. However, the literature also emphasises that the relationship is not evident in consumer behaviours. One of the suggestions for improving our results centres on the attitude-behaviour discrepancy needed for qualitative and experimental designs (ElHaffar et al., 2020).

What we know about green food consumption is limited, and current research initiatives may require new paradigms. There is also a need for measuring the effect of individual, micro, and macro factors together. Moreover, there is a gap in the literature that should be filled by examining consumer behaviour in specific consumption domains. Regarding substitution of meat, future studies may further explore consumer adoption of meat alternatives. Furthermore, the rational perspective is adopted in theories, and there are limited studies on the behavioural perspective. Our food decisions are not mainly dominated by our attitudes, values, and knowledge. Instead, choices are also influenced by habits, interconnected routine practices, and other behavioural determinants.

8 Study limitations

The study is not devoid of research limitations. First, the study has included published articles available in the Web of Sciences (WoS) database. Databases such as Scopus and Google Scholar may contain further relevant articles that are not covered in the review. Second, the study has only included publications that have applied a theoretical framework. The larger number of articles may not have referred to these theories; however, they may have covered some crucial determinants of sustainable food consumption. Third, the review described and explored frequent and most common factors in the literature that are statistically significant and did not consider the strength of the relationship between independent and dependent variables. Thus, it is recommended to conduct a meta-analysis, and it should examine the significance and strength of the relationships.

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