The current issue and full text archive of this journal is available on Emerald Insight at:
https://www.emerald.com/insight/0007-070X.htm

British Food Journal

Exploring alternative proteins: psychological drivers behind consumer engagement

Tommaso Fantechi, Nicola Marinelli, Leonardo Casini and Caterina Contini

Department of Agriculture, Food, Environment and Forestry (DAGRI), University of Florence, Florence, Italy

Received 23 October 2024
Revised 29 November 2024
Accepted 28 February 2025

Abstract

Purpose – This study examines the psychological drivers influencing the intention to engage alternative proteins as potential substitutes for meat, utilising an extended framework of the norm activation model. Our framework incorporates awareness of meat consumption impacts, personal responsibility, involvement in sustainable and healthy eating and involvement in animal welfare. These factors shape personal norms, which ultimately influence the intention to try new protein sources. The study also considers neophobia (both food neophobia and food technology neophobia) as a determinant of intention. Additionally, it analyses sociodemographic factors associated with previous experience of alternative protein consumption, providing a comprehensive understanding of consumer behaviour.

Design/methodology/approach – Data were collected from a representative sample of 500 Italian consumers through a structured questionnaire. The study employed a structural equation model to analyse the intention to engage seitan-based proteins, insect-based proteins and cultured meat. Constructs measured included awareness of impacts, personal responsibility, involvement in healthy eating, involvement in sustainable eating, involvement in animal welfare, food neophobia and food technology neophobia. Additionally, individual scores for the intention to engage with each protein type were calculated, followed by a seemingly unrelated regression analysis (SUR). This model incorporated sociodemographic factors and previous experiences (such as tasting history, frequency of consumption and opinion) as independent variables.

Findings – The findings reveal that involvement in sustainable eating and awareness of meat consumption impacts on environmental sustainability are significant predictors of personal norms, which in turn influence the intention to engage alternative proteins. Conversely, health and animal welfare considerations are closely linked to personal responsibility, shaping personal norms that guide engagement intentions. Furthermore, food neophobia and food technology neophobia were found to significantly reduce the intention to consume insect-based foods and cultured meats. SUR analysis also indicates that sociodemographic traits and previous experience are effective predictors of alternative protein consumption frequency.

Originality/value – This study applies an extended version of the norm activation model to explore the engagement of alternative proteins, offering new insights into the psychological drivers behind consumer behaviour in the context of health, environmental sustainability and animal welfare. By integrating these factors with awareness and personal responsibility, the research provides a comprehensive understanding of how personal norms shape intentions to engage alternative proteins. The findings contribute to the literature by highlighting the roles of these factors and offering practical implications for promoting sustainable and ethical food consumption.

Keywords Norm activation model, Ascription of responsibility, Awareness of consequences, Consumer behaviour, Food neophobia, Seitan, Insects, Cultured meat

Paper type Research paper

© Tommaso Fantechi, Nicola Marinelli, Leonardo Casini and Caterina Contini. Published by Emerald Publishing Limited. This article is published under the Creative Commons Attribution (CC BY 4.0) licence. Anyone may reproduce, distribute, translate and create derivative works of this article (for both commercial and non-commercial purposes), subject to full attribution to the original publication and authors. The full terms of this licence may be seen at http://creativecommons.org/licences/by/4.0/legalcode

Funding: This study was conducted in the Agritech National Research Center and received funding from the European Union Next-GenerationEU (PIANO NAZIONALE DI RIPRESA E RESILIENZA (PNRR)—MISSIONE 4 COMPONENTE 2, INVESTIMENTO 1.4—D.D. 1032 17/06/2022, CN00000022). This manuscript reflects solely the authors' views and opinions, not the positions of the European Union or the European Commission.

British Food Journal
Vol. 128 No. 3, 2026
pp. 939-956
Emerald Publishing Limited
e-ISSN: 1758-4108
p-ISSN: 0007-070X
DOI 10.1108/BFJ-10-2024-1066

Downloaded from http://ftp.nowpublishers.com/bfj/article-pdf/128/3/939/11301932/bfj-10-2024-1066en.pdf by guest on 18 June 2026

Introduction

The increasing interest in alternative proteins as substitutes for conventional meat is driven by the need to address significant global challenges, including public health, environmental sustainability, and animal welfare (Meriggi *et al.*, 2024). As consumers become more sensitive to the impacts of their dietary choices, understanding the psychological factors that influence the intention to engage these alternative proteins becomes essential.

Previous research has shown that consumer behaviour toward alternative proteins is shaped by a variety of factors, including environmental concerns, health motivations, and ethical considerations related to animal welfare. For instance, individuals with strong environmental values are often more inclined to reduce their meat consumption in favour of plant-based or cultured alternatives (Onwezen *et al.*, 2021; Onwezen and Dagevos, 2023; di Santo *et al.*, 2024). Similarly, health-conscious consumers are attracted to alternative proteins due to perceived benefits, such as lower cholesterol levels and a reduced risk of chronic diseases (Weinrich, 2019; de Oliveira Padilha *et al.*, 2022). Ethical concerns, particularly regarding animal welfare, also play a significant role in motivating the choice of meat substitutes (Bryant and Barnett, 2020; Tso *et al.*, 2020). However, much of the existing literature has tended to examine these factors in isolation, without fully exploring how they interact by the use of a comprehensive theoretical framework (Mosikyan *et al.*, 2024).

To provide a blueprint capable of simultaneously considering all the mentioned factors, we based our approach on the Norm Activation Model (NAM) introduced by Schwartz (1977), which has proven useful for understanding the intention to consume plant-based meat alternatives in China (Xueyun *et al.*, 2024) and seaweed in Norway (Govaerts and Olsen, 2022). The Model explains how personal norms are shaped by two key psychological factors: awareness of consequences (AC) and ascription of responsibility (AR). According to this framework, individuals are more likely to engage in pro-social or pro-environmental behaviours when they recognise the negative impacts of their actions on others or the environment and feel personally responsible for addressing these impacts. Once activated, personal norms serve as a guide for behaviour, motivating actions that align with social or environmental responsibility.

Building on this foundation, our approach extends the NAM by incorporating values as fundamental guiding principles (Schwartz, 1992). In particular, values play a crucial role in food-related decisions, where ethical, environmental, and health considerations often intersect with broader societal concerns. In our model, values are directly linked to the activation of personal norms, serving as an independent source of moral obligation. While maintaining AC and AR as essential determinants of personal norms, this perspective highlights the unique role of values in influencing behaviour across these contexts.

By integrating values into the NAM, our framework not only refines the understanding of how moral obligation is shaped but also underscores their centrality in driving ethical and sustainable choices. This contribution is particularly relevant in addressing food-related behaviours, where personal values and societal priorities often converge.

We conceptualise involvement in sustainable eating as an expression of the universalism–nature value, defined as a commitment to preserving the natural environment (Schwartz *et al.*, 2012). Similarly, involvement in healthy eating reflects Schwartz's conceptualisation of health as a security value, where the focus on personal well-being and dietary health benefits aligns with a sense of safety and stability. Involvement in animal welfare reflects the value of animal welfare, characterised by an empathic motivation to ensure the well-being of all animals (Lee *et al.*, 2019). Together, these value-driven motivations underpin the moral obligations that shape personal norms, emphasising their central role in fostering ethical and sustainable behaviours.

Additionally, we have included food neophobia (FN) and food technology neophobia (FTN) in our model to account for psychological barriers that affect consumer intentions. FN

Downloaded from http://ftp.nowpublishers.com/bfj/article-pdf/128/3/939/11301932/bfj-10-2024-1066en.pdf by guest on 18 June 2026

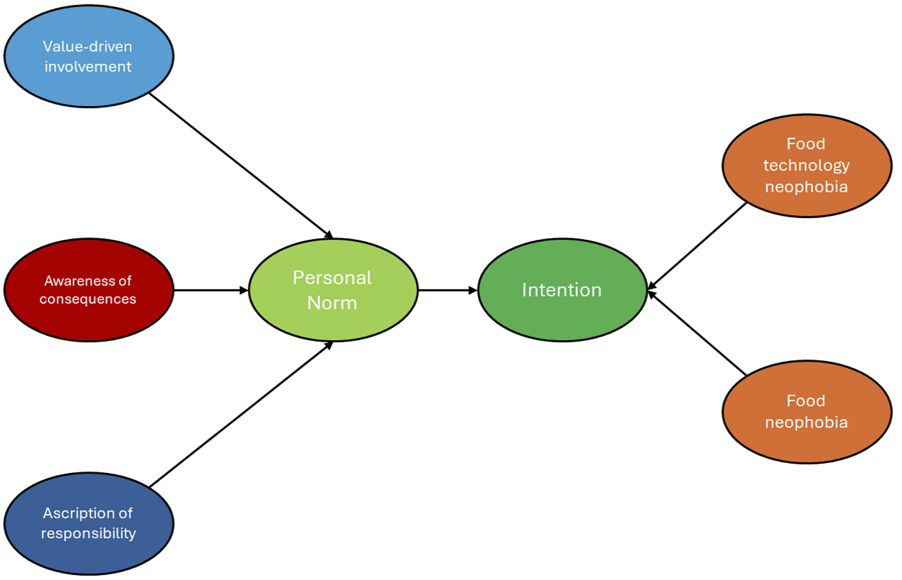
refers to an aversion to trying unfamiliar foods (Pliner and Hobden, 1992), while FTN describes resistance towards foods produced using novel technologies (Cox and Evans, 2008). We hypothesise that FN and FTN act as independent moderating factors between personal norms and behavioural intentions, reflecting stable dispositions that can hinder the adoption of alternative proteins (Fantechi *et al.*, 2024). Their inclusion allows us to better capture the complexity of consumer decision-making, particularly when evaluating novel food options such as alternative proteins. The model described is shown in Figure 1.

This study advances understanding by developing a comprehensive framework that highlights the interplay between psychological drivers, values, and barriers in shaping ethical and sustainable food choices. The findings provide new perspectives for stakeholders, enabling the design of marketing strategies, public policies, and educational initiatives that effectively promote the adoption of alternative proteins and support sustainable dietary practices.

Methodology

To understand the factors influencing the intention to engage with alternative proteins in place of meat, a survey was conducted in August 2024 with a representative sample of 500 Italian consumers, recruited through an international marketing research firm (Toluna, Inc., Wilton, CT, USA). The sample was stratified by gender, age, and region of residence, ensuring that it reflected the demographics of the Italian population, as detailed in Table 1.

The questionnaire was structured into four distinct sections. The first section aimed to identify the target sample. It was administered to individuals who reported consuming red and/or white meat beyond the limits recommended by the Mediterranean diet, which is widely



Source(s): Authors' own work

Figure 1. Theoretical framework

Downloaded from http://ftp.nowpublishers.com/bfj/article-pdf/128/3/939/11301932/bfj-10-2024-1066en.pdf by guest on 18 June 2026

Table 1. Sociodemographic characteristics of our sample ($N = 500$)

Variable	Sample (%)	Italian population (%)
Gender		
Male	49	49
Female	51	51
Age		
18–34	24	24
35–54	38	38
>54	38	38
Region		
North	45	45
Central Italy	20	20
South and islands	35	35
Education		
Junior high school or below	7	36
High school diploma	52	43
College education or higher	41	21

Note(s): For the Italian population we used ISTAT data
Source(s): Authors' own work

recognized as a healthy and balanced dietary pattern (Cavaliere *et al.*, 2018; Gerini *et al.*, 2022). To avoid misunderstandings regarding the types of products considered, examples of the most commonly consumed red and white meats were provided. The final sample included participants who reported consuming red meat more than once a week, white meat more than twice a week, or both.

In the following section, we measured involvement in sustainability, involvement in healthy eating and involvement in animal welfare, as key drivers of meat reduction and engagement of alternative proteins (Califano *et al.*, 2023; Piracci *et al.*, 2024). These constructs along with personal responsibility, awareness, and personal norms were assessed using previously validated Likert scale items, ranging from 1 (completely disagree) to 7 (completely agree) (Table 2).

To evaluate the intention to engage alternative proteins, we focused on three different products: insect-based proteins, seitan-based proteins, and cultured meat. These products were selected to investigate whether the influence of antecedents varies by product type, considering the distinct categories they represent—animal-based, plant-based, and biotechnology-based—and their varying availability on the market. Notably, while seitan is widely available in Italian supermarkets, insect-based proteins are still limited, often found only in specialized or niche markets. In contrast, the purchase of cultured meat is strictly prohibited in Italy, as current national regulations prevent its commercialization. Previous research indicates that consumer attitudes towards these alternatives differ significantly due to cultural, ethical, and psychological factors. Insect-based proteins face cultural resistance in Western countries (Simeone and Scarpato, 2021; Kröger *et al.*, 2022), cultured meat is met with scepticism regarding its unnaturalness and safety (Wilks *et al.*, 2021), and seitan, although more accepted, remains niche due to limited exposure (Andreani *et al.*, 2023). Given the novelty of these products, the study also incorporated measures of food technology neophobia and food neophobia, which are significant barriers to the engagement of novel foods (Fantechi *et al.*, 2024).

Downloaded from http://ftp.nowpublishers.com/bfj/article-pdf/128/3/939/11301932/bfj-10-2024-1066en.pdf by guest on 18 June 2026

Table 2. Items and constructs used in the analysis

Construct	Code	Item	Source
Involvement in sustainable eating	SUST1	Sustainable eating is very important to me	Van Loo *et al.* (2017)
	SUST2	I care a lot about sustainable eating	
	SUST3	Sustainable eating means a lot to me	
	SUST4	I am very concerned about the consequences of what I eat in terms of sustainability	
Involvement in animal welfare	AW1	It is important that the food I eat on a typical day has been produced in a way that animals have not experienced pain	Krystallis *et al.* (2009)
	AW2	It is important that the food I eat on a typical day has been produced in a way that animals' rights have been respected	
	AW3	In general, humans have too little respect for the quality of life of animals	
	AW4	Increased regulation of the treatment of animals in farming is needed	
	AW5	Animal agriculture raises serious ethical questions about the treatment of animals	
Involvement in healthy eating	H1	Healthy eating is very important to me	Van Loo *et al.* (2017)
	H2	I care a lot about healthy eating	
	H3	Healthy eating means a lot to me	
	H4	I am very concerned about the health-related consequences of what I eat	
Awareness of meat consumption's impact on sustainability	SUST_AW1	Meat consumption causes the exhaustion of natural resources	Zhang *et al.* (2013)
	SUST_AW2	Meat consumption contributes to local ecological damage	
	SUST_AW3	I am aware of the influence meat consumption has on global warming	
	SUST_AW4	Overall, meat consumption can cause some negative environmental consequences	
Awareness of meat consumption's impact on animal welfare	AW_AW1	Meat consumption affects the welfare of animals	Zhang *et al.* (2013)
	AW_AW2	Meat consumption contributes to animal suffering	
	AW_AW3	I am aware of the influence meat consumption has on animal welfare	
	AW_AW4	Overall, meat consumption can cause negative consequences for animals	
Awareness of meat consumption's impact on health	H_AW1	Meat consumption affects my health	Zhang *et al.* (2013)
	H_AW2	Meat consumption contributes to various health issues	
	H_AW3	I am aware of the influence meat consumption has on my overall health	
	H_AW4	Overall, meat consumption can cause some negative health consequences	
Ascription of responsibility for the sustainability impacts	SUST_RESP1	I feel jointly responsible for the exhaustion of natural resources due to meat consumption	deGroot and Steg (2009)
	SUST_RESP2	I feel joint responsibility for the contribution of meat consumption to global warming	
	SUST_RESP3	I feel joint responsibility for the contribution of meat consumption to local ecological damage	
	SUST_RESP4	I feel joint responsibility for the negative environmental consequences of meat consumption	

(*continued*)

Downloaded from http://ftp.nowpublishers.com/bfj/article-pdf/128/3/939/11301932/bfj-10-2024-1066en.pdf by guest on 18 June 2026

Table 2. Continued

Construct	Code	Item	Source
Ascription of responsibility for animal welfare impacts	AW_RESP1	I feel jointly responsible for the impact of meat consumption on animal welfare	deGroot and Steg (2009)
	AW_RESP2	I feel joint responsibility for the suffering caused by meat consumption	
	AW_RESP3	I feel joint responsibility for the negative effects of meat consumption on animals	
	AW_RESP4	I feel joint responsibility for the welfare of animals affected by meat consumption	
Ascription of responsibility for health impacts	H_RESP1	I feel jointly responsible for health impacts of my meat consumption	deGroot and Steg (2009)
	H_RESP2	I feel joint responsibility for the health issues caused by meat consumption	
	H_RESP3	I feel joint responsibility for the negative health effects of meat consumption	
	H_RESP4	I feel joint responsibility for maintaining my health through mindful meat consumption	
Personal Norms	PN1	It would be against my moral principles not to consider the overall impacts of meat consumption	Godin *et al*. (2005)
	PN2	Not considering the consequences of meat consumption would go against my principles	
	PN3	I have a moral obligation to take into account the broader consequences when consuming meat	
	PN4	I would feel guilty about not considering the impacts of meat consumption	
	PN5	I feel obliged to make meat consumption choices that reflect a concern for its overall impacts	
Food technology neophobia	FTN1	There is no sense trying out high-tech food products because the ones I eat are already good enough	Verneau *et al*. (2014), Cox and Evans (2008)
	FTN2	New food technologies are something I am uncertain about	
	FTN3	New foods are not healthier than traditional foods	
	FTN4	The benefits of new food technologies are often grossly overstated	
	FTN5	There are plenty of tasty foods around, so we do not need to use new food technologies to produce more	
	FTN6	New food technologies decrease the natural quality of food	
	FTN7	It can be risky to switch to new food technologies too quickly	
	FTN8	Society should not depend heavily on technologies to solve its food problems	
Food neophobia	NEO1	I am constantly sampling new and different foods	Pliner and Hobden (1992)
	NEO2	I like foods from different countries	
	NEO3	At dinner, I will try a new food	
	NEO4	I like to try new ethnic restaurants	

(*continued*)

Downloaded from http://ftp.nowpublishers.com/bfj/article-pdf/128/3/939/11301932/bfj-10-2024-1066en.pdf by guest on 18 June 2026

Table 2. Continued

Construct	Code	Item	Source
Intention to engage new food – insects	INT_INS1	If I had the opportunity, I plan to include insect-based proteins in my diet	Ajzen and Sheikh (2013), Dunn *et al.* (2011)
	INT_INS2	If given the chance, I intend to add insect-based proteins to my meals	
	INT_INS3	If the option were available, I would make an effort to incorporate insect-based proteins into my diet	
	INT_INS4	It is likely that I would choose to consume insect-based protein foods regularly if they were accessible	
Intention to engage new food – cultured meat	INT_MEAT1	If I had the opportunity, I plan to include cultured meat in my diet	Ajzen and Sheikh (2013), Dunn *et al.* (2011)
	INT_MEAT2	If given the chance, I intend to add cultured meat to my meals	
	INT_MEAT3	If the option were available, I would make an effort to incorporate cultured meat into my diet	
	INT_MEAT4	It is likely that I would choose to consume cultured meat regularly if it were accessible	
Intention to engage new food – seitan	INT_SEITAN1	I plan to include or increase seitan in my diet	Ajzen and Sheikh (2013), Dunn *et al.* (2011)
	INT_SEITAN2	I intend to add or increase seitan to my meals	
	INT_SEITAN3	I will make an effort to incorporate or increase seitan into my diet	
	INT_SEITAN4	It is likely that I will consume seitan regularly	

Source(s): Authors' own work

Table 2 lists all the constructs and items used in the model, along with their sources.

In the third section, respondents were asked about their previous experience with the three alternative proteins, including whether they had tasted them, the frequency of consumption, and their opinions on taste.

The final section collected demographic data, including gender, age, geographical region (North, Central, or South), and level of education.

For the analysis, we employed a structural equation modelling (SEM) approach, which proved effective for this type of study (Dias *et al.*, 2024; Gastaldello *et al.*, 2022). Within the same SEM framework, the intention to engage with each specific protein alternative was included, resulting in three separate structural equations—one for each product—with intention as the dependent variable.

Following the implementation of the SEM model, we calculated the standardised factor scores from the structural model for all three intentions for each respondent. The aim was to observe which sociodemographic factors (gender, age, education) and familiarity with the products (previous tasting, frequency of consumption, and opinions about them) influence intention. Using these factor scores as dependent variables, we employed a Seemingly Unrelated Regression (SUR) model consisting of three separate equations—one for each protein under investigation. The choice of the SUR model was based on the assumption that the errors across the three equations were correlated, a condition that the methodology explicitly accounts for. This assumption was empirically validated using the Breusch-Pagan test.

Downloaded from http://ftp.nowpublishers.com/bfj/article-pdf/128/3/939/11301932/bfj-10-2024-1066en.pdf by guest on 18 June 2026

Results

Before implementing the SEM model, the constructs used were evaluated. Internal consistency was measured using Cronbach's alpha, which satisfactorily exceeded the acceptability threshold of 0.7 (George and Mallery, 2003; Cronbach, 1951).

To assess the model, we conducted a confirmatory factor analysis (CFA) to ensure convergent and discriminant validity, using the maximum likelihood estimation method. For convergent validity, we examined the AVE (average variance extracted) values and factor loadings, both of which were above the 0.5 threshold (Cheung and Wang, 2017; Fornell and Larcker, 1981). Discriminant validity was confirmed because the Square Correlation (SC) values were lower than the AVE for the respective constructs. Table 3 presents this comparison between AVE and SC, while Table 4 includes Cronbach's alpha for each construct and the factor loadings of each item, along with their means and standard deviations.

The SEM model demonstrates satisfactory goodness-of-fit statistics, which are essential for the reliability of the results (Hu and Bentler, 1999). We evaluated the RMSEA, which should be less than 0.08; the CFI index, with a minimum threshold of 0.9; the SRMR, with a maximum of 0.08; the TLI, which should be above 0.9; and the χ^2 to degrees of freedom ratio, which should be less than 3. Table 5 presents these values, all of which fall within acceptable ranges.

Table 6 shows the results of the structural model. Among the values, only involvement in sustainable eating has a positive and significant impact. Similarly, sustainability is the only significant factor in the context of awareness. In contrast, within the ascription of responsibility, health and animal welfare emerge as significant factors.

All three antecedents to intention are significant across the three alternative proteins. Specifically, stronger personal norms are associated with a greater intention to engage alternative proteins, while higher levels of food neophobia and food technology neophobia correspond to a lower intention. The impact of these constructs varies among the three proteins: for insect-based proteins, food neophobia is the most influential factor; for cultured meat, it is food technology neophobia; and for seitan, personal norms play the most significant role.

Figure 2 shows the model presented in Figure 1, with each construct divided into its various dimensions. It also includes the coefficients derived from the SEM model.

Table 7 presents data on our sample's experiences with the alternative proteins studied. Overall, the three sources of proteins are not widely known among consumers, but seitan is consumed significantly more often than insects and cultured meat. Interestingly, the majority of those who have tried the alternative proteins were satisfied with the taste.

Table 8 presents the results of the three regressions from the SUR model. The Breusch–Pagan test of independence was significant ($\chi^2 = 338.833$, $p = 0.00$), indicating a correlation between the residuals of the three regressions and thus supporting the use of the SUR model. Gender is a significant factor for insect-based proteins, with men showing a greater intention to include them in their diet. Younger individuals express significantly more interest in all three types of proteins compared to older individuals, as do those with higher levels of education. Previous experience with the product, as a positive opinion of the taste, has a positive and significant impact on the intention to engage all products, while a higher frequency of consumption increases the intention only for seitan.

Discussions

Building on an extended version of the Norm Activation Model, this study examines the distinct roles of awareness, personal responsibility, and value-driven motivations—centred on environmental sustainability, health, and animal welfare—in shaping personal norms. These norms, in turn, drive the intention to adopt alternative proteins. The findings shed new light on the psychological mechanisms underlying dietary shifts and offer valuable guidance for designing targeted strategies to encourage the exploration and adoption of alternative protein sources.

Downloaded from http://ftp.nowpublishers.com/bfj/article-pdf/128/3/939/11301932/bfj-10-2024-1066en.pdf by guest on 18 June 2026

Table 3. AVE and SC of the constructs

	Construct	AVE	Squared correlation among latent variables													
			1	2	3	4	5	6	7	8	9	10	11	12	13_1	13_2	13_3
1	Involvement in sustainable eating	0.86	1														
2	Involvement in animal welfare	0.62	0.29	1													
3	Involvement in healthy eating	0.77	0.33	0.15	1												
4	Awareness of meat consumption's impact on sustainability	0.82	0.38	0.28	0.09	1											
5	Awareness of meat consumption's impact on animal welfare	0.76	0.29	0.37	0.09	0.61	1										
6	Awareness of meat consumption's impact on health	0.77	0.29	0.19	0.09	0.52	0.52	1									
7	Ascription of responsibility for the sustainability impacts	0.92	0.34	0.19	0.08	0.69	0.47	0.42	1								
8	Ascription of responsibility for animal welfare impacts	0.87	0.39	0.34	0.08	0.59	0.61	0.42	0.69	1							
9	Ascription of responsibility for health impacts	0.84	0.31	0.20	0.12	0.47	0.41	0.47	0.55	0.53	1						
10	Personal norm	0.82	0.59	0.33	0.20	0.55	0.48	0.44	0.52	0.59	0.50	1					
11	Food technology neophobia	0.62	0.00	0.00	0.05	0.05	0.02	0.01	0.04	0.01	0.01	0.02	1				
12	Food neophobia	0.69	0.15	0.09	0.03	0.14	0.09	0.11	0.16	0.11	0.12	0.15	0.10	1			
13_1	Intention to engage new food – insects	0.94	0.06	0.02	0.00	0.12	0.05	0.06	0.12	0.08	0.09	0.10	0.09	0.20	1		
13_2	Intention to engage new food – cultured meat	0.95	0.08	0.06	0.00	0.21	0.14	0.12	0.21	0.17	0.13	0.16	0.29	0.21	0.37	1	
13_3	Intention to engage new food – seitan	0.91	0.16	0.10	0.04	0.25	0.18	0.19	0.27	0.23	0.20	0.25	0.08	0.24	0.27	0.32	1

Source(s): Authors' own work

Downloaded from http://ftp.nowpublishers.com/bfj/article-pdf/128/3/939/11301932/bfj-10-2024-1066en.pdf by guest on 18 June 2026

Table 4. Cronbach's alpha of constructs and factor loadings, mean, and standard deviation of all the items

Construct	Alpha	Code	Factor loadings	Mean	Standard deviation
Involvement in sustainable eating	0.96	SUST1	0.94	5.04	1.56
		SUST2	0.94	4.79	1.67
		SUST3	0.96	4.89	1.66
		SUST4	0.86	4.64	1.75
Involvement in animal welfare	0.89	AW1	0.74	5.69	1.48
		AW2	0.73	5.85	1.40
		AW3	0.76	5.48	1.60
		AW4	0.84	5.88	1.41
		AW5	0.85	5.66	1.51
Involvement in healthy eating	0.92	H1	0.91	5.77	1.23
		H2	0.94	5.51	1.39
		H3	0.96	5.57	1.40
		H4	0.67	5.11	1.55
Awareness of meat consumption's impact on sustainability	0.95	SUST_AW1	0.94	4.28	1.82
		SUST_AW2	0.94	4.27	1.84
		SUST_AW3	0.83	4.57	1.81
		SUST_AW4	0.90	4.61	1.81
Awareness of meat consumption's impact on animal welfare	0.93	AW_AW1	0.93	4.71	1.78
		AW_AW2	0.93	4.89	1.79
		AW_AW3	0.72	4.95	1.67
		AW_AW4	0.90	4.88	1.73
Awareness of meat consumption's impact on health	0.93	H_AW1	0.93	4.09	1.78
		H_AW2	0.96	4.27	1.76
		H_AW3	0.70	4.91	1.59
		H_AW4	0.89	4.57	1.71
Ascription of responsibility for the sustainability impacts	0.98	SUST_RESP1	0.93	3.88	1.88
		SUST_RESP2	0.97	3.87	1.91
		SUST_RESP3	0.98	3.86	1.90
		SUST_RESP4	0.97	3.84	1.93
Ascription of responsibility for animal welfare impacts	0.96	AW_RESP1	0.93	4.28	1.83
		AW_RESP2	0.96	4.22	1.89
		AW_RESP3	0.97	4.20	1.89
		AW_RESP4	0.86	4.28	1.87
Ascription of responsibility for health impacts	0.96	H_RESP1	0.91	4.48	1.80
		H_RESP2	0.96	4.39	1.85
		H_RESP3	0.96	4.32	1.86
		H_RESP4	0.83	4.68	1.75
Personal norm	0.96	PN1	0.91	4.59	1.68
		PN2	0.87	4.52	1.75
		PN3	0.94	4.64	1.80
		PN4	0.93	4.44	1.86
		PN5	0.88	4.31	1.80
Food technology neophobia	0.93	FTN1	0.79	4.98	1.71
		FTN2	0.81	5.09	1.65
		FTN3	0.70	4.84	1.72
		FTN4	0.81	4.97	1.55
		FTN5	0.84	4.94	1.71
		FTN6	0.84	4.89	1.75
		FTN7	0.74	5.03	1.58
		FTN8	0.73	4.96	1.66
Food neophobia	0.90	NEO1	0.79	4.54	1.73
		NEO2	0.85	4.84	1.74
		NEO3	0.79	4.17	1.77
		NEO4	0.90	4.39	1.93

(*continued*)

Downloaded from http://ftp.nowpublishers.com/bfj/article-pdf/128/3/939/11301932/bfj-10-2024-1066en.pdf by guest on 18 June 2026

Table 4. Continued

Construct	Alpha	Code	Factor loadings	Mean	Standard deviation
Intention to engage new food – insects	0.98	INT_INS1	0.98	2.41	1.85
		INT_INS2	0.99	2.39	1.89
		INT_INS3	0.95	2.44	1.87
		INT_INS4	0.96	2.30	1.81
Intention to engage new food – cultured meat	0.99	INT_MEAT1	0.98	3.40	2.06
		INT_MEAT2	0.99	3.40	2.08
		INT_MEAT3	0.97	3.44	2.08
		INT_MEAT4	0.96	3.35	2.06
Intention to engage new food – seitan	0.98	INT_SEITAN1	0.97	3.10	1.93
		INT_SEITAN2	0.98	3.05	1.94
		INT_SEITAN3	0.93	3.11	1.95
		INT_SEITAN4	0.94	3.18	2.01

Source(s): Authors' own work

Table 5. Goodness-of-fit statistics of the SEM model

Index	
RMSEA	0.05
CFI	0.95
SRMR	0.05
TLI	0.94
χ^2/degrees of freedom	2.21

Source(s): Authors' own work

Involvement in sustainable eating emerged as the most influential factor in shaping personal norms, which in turn drive the intention to adopt alternative proteins. This suggests that consumers who prioritise environmental sustainability are more inclined to reduce their meat consumption and opt for alternatives such as seitan, cultured meat, or insect-based proteins. The significant impact of sustainability awareness on personal norms indicates that understanding the environmental consequences of meat consumption acts as a catalyst, motivating individuals to develop stronger personal norms and take action to mitigate these impacts. This environmental focus is in line with broader literature, which consistently identifies sustainability as a key driver for reducing meat consumption (Grummon *et al.*, 2023; Kemper *et al.*, 2023; Seffen and Dohle, 2023). For consumers inclined to engage alternative proteins, this shift is primarily motivated by a desire to align their dietary habits with environmental care (Jang and Cho, 2022; Ong *et al.*, 2024). Promoting the benefits of alternative proteins, such as their lower carbon footprints and reduced land use, is likely to be particularly effective in reinforcing personal norms and encouraging dietary changes that reduce meat consumption.

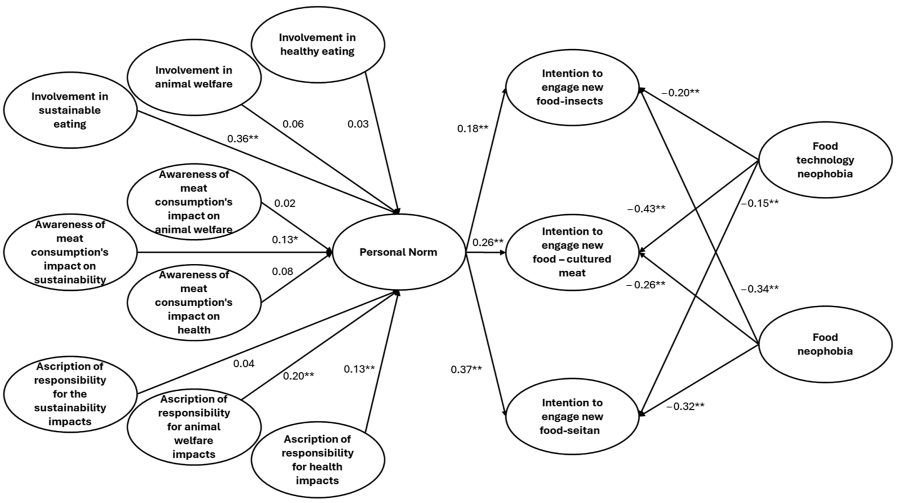
Health is another significant factor influencing personal norms that drive the intention to engage alternative proteins, but it operates through a different mechanism compared to sustainable eating. Here, the influence is more closely tied to individualistic behaviour, which prioritises personal well-being and health. The study found that personal responsibility for health is a key determinant, consistent with the literature indicating that individuals who feel accountable for their well-being are more likely to engage in a balanced diet (Wongprawmas

Downloaded from http://ftp.nowpublishers.com/bfj/article-pdf/128/3/939/11301932/bfj-10-2024-1066en.pdf by guest on 18 June 2026

Table 6. Structural model results

Construct	Personal Norm	Intention to engage insects	Intention to engage cultured meat	Intention to engage seitan
Involvement in sustainable eating	0.36**			
Involvement in animal welfare	0.06			
Involvement in healthy eating	0.03			
Awareness of meat consumption's impact on sustainability	0.13*			
Awareness of meat consumption's impact on animal welfare	0.02			
Awareness of meat consumption's impact on health	0.08			
Ascription of responsibility for the sustainability impacts	0.04			
Ascription of responsibility for animal welfare impacts	0.20**			
Ascription of responsibility for health impacts	0.13**			
Personal norm		0.18**	0.26**	0.37**
Food technology neophobia		−0.20**	−0.43**	−0.15**
Food neophobia		−0.34**	−0.26**	−0.32**

Note(s): ** indicates $p < 0.01$, * indicates $p < 0.05$
Source(s): Authors' own work



Note(s): * indicates $p < 0.05$, ** indicates $p < 0.01$
Source(s): Authors' own work

Figure 2. Theoretical framework with SEM Model results

et al., 2021). This sense of responsibility is rooted in the desire to prevent diet-related diseases, maintain a balanced diet, and improve overall quality of life (Marinelli *et al.*, 2015; Vajdi and Farhangi, 2020). However, our study also found that awareness of the health benefits of reducing meat consumption does not significantly influence personal norms or intentions directly, suggesting that simply providing information may not be enough to foster personal norms. Instead, stakeholders—including both public and private entities—should focus on strategies that make healthy eating both achievable and personally meaningful by creating a supportive environment. For example, communication campaigns could emphasise immediate, tangible health outcomes like increased energy levels, improved digestion, or

Downloaded from http://ftp.nowpublishers.com/bfj/article-pdf/128/3/939/11301932/bfj-10-2024-1066en.pdf by guest on 18 June 2026

Table 7. Experience with foods based on insects, cultured meat and seitan

Foods based on . . .	Insects	Cultured meat	Seitan
Already tasted			
Yes	43	38	164
No	457	480	336
Consumption frequency			
I've only tasted them	31	35	96
I've consumed it multiple times in the past year	12	3	68
Opinion			
I didn't like them at all	9	7	47
I liked them, but I wouldn't eat them again	15	16	37
I liked them	19	15	80

Source(s): Authors' own work

Table 8. Experience with foods based on insects, cultured meat and seitan

Variable	Insect	Cultured meat	Seitan
Gender (female = 1)	−0.55**	−0.17	0.10
Age	−0.03**	−0.03**	−0.02**
Education	0.26*	0.40**	0.38**
Previous tested	2.19**	1.51*	1.77**
Consumption frequency	0.27	0.18	0.58**
Opinion	1.48**	0.96**	0.83**
Constant	−2.87*	−2.28	−4.11**

Note(s): ** indicates $p < 0.01$, * indicates $p < 0.05$
Source(s): Authors' own work

better weight management. Personalised nutrition plans and interactive tools like health tracking apps can also help bridge the gap between general awareness and the development of personal responsibility.

Involvement in animal welfare also emerges as a significant factor influencing personal norms, which drive the intention to engage alternative proteins. This dimension is strongly associated with altruistic principles, which are concerned with the well-being of others, including non-human animals. Similar to healthy eating, personal responsibility plays a leading role in this context. Individuals who perceive themselves as responsible for the ethical treatment of animals are more likely to develop strong personal norms that lead to reducing meat consumption and opting for alternatives that minimise animal suffering. This sense of personal responsibility is often driven by deeply held ethical or moral convictions that go beyond mere awareness of animal welfare issues (Peschel *et al.*, 2024). These findings align with existing research that highlights the ethical dilemmas associated with conventional meat production, such as the poor treatment of animals in industrial farming systems (de Boer and Aiking, 2022). For consumers who experience this dilemma, alternative proteins offer a way to reconcile their dietary habits with their ethical beliefs. Therefore, promoting the ethical advantages of alternative proteins, such as animal-free production methods and the avoidance of animal exploitation, is crucial to resonate with their altruistic perspective. Communication efforts should focus on ethical production practices and the benefits of avoiding animal exploitation associated with products.

Downloaded from http://ftp.nowpublishers.com/bfj/article-pdf/128/3/939/11301932/bfj-10-2024-1066en.pdf by guest on 18 June 2026

The distinction between how environmental sustainability and the other two dimensions—health and animal welfare—influence the intention to engage with alternative proteins may lie in the nature of the motivations themselves. Biospheric concerns associated with sustainability are often linked to global and long-term consequences, relying more on collective awareness and self-transcendent motivations, which then influence the development of personal norms. Consumers motivated by sustainability are thus likely influenced by a broader sense of global responsibility and a desire to contribute to the greater good by reducing their environmental impact. In contrast, health-related motivations often yield immediate and tangible benefits, such as improvements in physical well-being, which directly reinforce personal responsibility. While concerns for animal welfare may not always lead to immediate personal rewards, they can evoke strong emotional responses, such as a reduction in guilt associated with consuming animal products (Lin-Schilstra and Fischer, 2020). This emotional engagement can similarly reinforce personal responsibility as a primary motivator for developing strong personal norms. When it comes to health, individuals are more likely to take action when they can directly observe the benefits or consequences of their dietary choices on their physical well-being. Similarly, concerns about animal welfare, often rooted in strong ethical or moral convictions, make personal responsibility a more immediate and powerful force in shaping behaviour.

The study also examined the impact of neophobia—specifically, food neophobia and food technology neophobia—on the intention to engage alternative proteins. The findings indicate that neophobia significantly reduces the likelihood of consumers engaging novel proteins, particularly insect-based and cultured meats. Consistent with existing literature, food neophobia emerged as the most influential antecedent of the intention to consume insect-based proteins. For cultured meat, food technology neophobia presented the more substantial barrier, reflecting consumer concerns about the perceived unnaturalness and safety of these products (Wilks *et al*., 2021). In contrast, seitan was less impacted by neophobia, with personal norms playing a more pivotal role in shaping consumers' intentions to engage it.

The linear regression analysis provided further insights by examining how sociodemographic factors and previous experiences with alternative proteins influence the intention to engage these products. The analysis revealed that younger individuals and those with higher levels of education are more likely to engage alternative proteins, particularly seitan and insect-based proteins. Previous positive experiences with these products, such as tasting and consumption, significantly increased the intention to engage them, suggesting that familiarity and positive experiences are crucial in overcoming initial resistance. Additionally, a favourable opinion of the taste of these proteins was a strong predictor of engagement, underscoring the importance of sensory appeal in driving consumer acceptance.

These findings have implications for stakeholders looking to promote the engagement of novel foods, particularly those like cultured meat and insect-based proteins, which can encounter considerable consumer resistance. To address the challenges posed by neophobia, it is crucial to focus on strategies that enhance consumer familiarity with novel foods through direct, positive experiences. Opportunities for tasting and interacting with these products in environments where they are already available can help build consumer trust and reduce the apprehension associated with engaging new food products.

The study's sociodemographic insights suggest that targeting younger, more educated consumers could be an effective strategy for facilitating the acceptance of novel foods. Tailored marketing efforts that emphasise the sensory qualities of these products—particularly their taste and texture—are likely to resonate well with these demographic groups. Ensuring that novel foods excel in sensory appeal is essential for their success, as this is a key driver of consumer acceptance.

Conclusion

This study provides a comprehensive analysis of the psychological factors influencing the intention to engage alternative proteins, applying an extended version of the Norm Activation

Downloaded from http://ftp.nowpublishers.com/bfj/article-pdf/128/3/939/11301932/bfj-10-2024-1066en.pdf by guest on 18 June 2026

Model to offer novel insights into consumer behaviour. The findings suggest that while involvement in sustainable eating is a key driver for engaging alternative proteins, personal responsibility is crucial in the domains of health and animal welfare, motivating consumers through more immediate and tangible outcomes. Furthermore, this research highlights the critical influence of personal norms, emphasizing how awareness and a sense of responsibility shape intentions to engage with alternative proteins, particularly in the context of health, environmental sustainability, and animal welfare. Neophobia, particularly regarding insect-based and cultured meats, poses a significant barrier to engagement, underscoring the need for strategies that increase familiarity and positive experiences with these products.

However, while the study has limitations, these also offer opportunities for future research. The main limitation is its focus on a single national context, Italy, which may restrict the generalizability of the findings to other cultural settings. This limitation opens up the potential for future studies to conduct cross-cultural comparisons, providing a more comprehensive understanding of how different cultural factors influence engagement with alternative proteins.

Given the significant impact of neophobia, future research should also explore strategies to reduce resistance to novel foods. Understanding how to effectively address neophobia and increase consumer acceptance of alternative proteins will be critical for promoting sustainable dietary shifts. By exploring new avenues of research, future studies can build on the findings of this study and contribute to the development of more effective strategies for encouraging the engagement of alternative proteins, ultimately promoting more sustainable, healthy, and ethical food consumption patterns.

References

Ajzen, I. and Sheikh, S. (2013), "Action versus inaction: anticipated affect in the theory of planned behavior", *Journal of Applied Social Psychology*, Vol. 43 No. 1, pp. 155-162, doi: 10.1111/j.1559-1816.2012.00989.x.

Andreani, G., Sogari, G., Marti, A., Froldi, F., Dagevos, H. and Martini, D. (2023), "Plant-based meat alternatives: technological, nutritional, environmental, market, and social challenges and opportunities", *Nutrients*, Vol. 15 No. 2, p. 452, doi: 10.3390/nu15020452.

Bryant, C. and Barnett, J. (2020), "Consumer acceptance of cultured meat: an updated review (2018-2020)", *Applied Sciences*, Vol. 10 No. 15, p. 5201, doi: 10.3390/app10155201.

Califano, G., Furno, M. and Caracciolo, F. (2023), "Beyond one-size-fits-all: consumers react differently to packaging colors and names of cultured meat in Italy", *Appetite*, Vol. 182, 106434, doi: 10.1016/j.appet.2022.106434.

Cavaliere, A., De Marchi, E. and Banterle, A. (2018), "Exploring the adherence to the Mediterranean diet and its relationship with individual lifestyle: the role of healthy behaviors, pro-environmental behaviors, income, and education", *Nutrients*, Vol. 10 No. 2, p. 141, doi: 10.3390/nu10020141.

Cheung, G.W. and Wang, C. (2017), "Current approaches for assessing convergent and discriminant validity with SEM: issues and solutions", *Academy of management proceedings*, Briarcliff Manor, NY 10510: Academy of Management, Vol. 2017, No. 1, 12706, doi: 10.5465/ambpp.2017.12706abstract.

Cox, D.N. and Evans, G. (2008), "Construction and validation of a psychometric scale to measure consumers' fears of novel food technologies: the food technology neophobia scale", *Food Quality and Preference*, Vol. 19 No. 8, pp. 704-710, doi: 10.1016/j.foodqual.2008.04.005.

Cronbach, L.J. (1951), "Coefficient alpha and the internal structure of tests", *Psychometrika*, Vol. 16 No. 3, pp. 297-334, doi: 10.1007/bf02310555.

de Boer, J. and Aiking, H. (2022), "Considering how farm animal welfare concerns may contribute to more sustainable diets", *Appetite*, Vol. 168, 105786, doi: 10.1016/j.appet.2021.105786.

Downloaded from http://ftp.nowpublishers.com/bfj/article-pdf/128/3/939/11301932/bfj-10-2024-1066en.pdf by guest on 18 June 2026

De Groot, J.I. and Steg, L. (2009), "Morality and prosocial behavior: the role of awareness, responsibility, and norms in the norm activation model", *The Journal of Social Psychology*, Vol. 149 No. 4, pp. 425-449, doi: 10.3200/socp.149.4.425-449.

de Oliveira Padilha, L.G., Malek, L. and Umberger, W.J. (2022), "Consumers' attitudes towards lab-grown meat, conventionally raised meat and plant-based protein alternatives", *Food Quality and Preference*, Vol. 99, 104573, doi: 10.1016/j.foodqual.2022.104573.

di Santo, N., Califano, G., Sisto, R., Caracciolo, F. and Pilone, V. (2024), "Are university students really hungry for sustainability? A choice experiment on new food products from circular economy", *Agricultural and Food Economics*, Vol. 12 No. 1, p. 21, doi: 10.1186/s40100-024-00315-9.

Dias, A., Sousa, B., Santos, V., Ramos, P. and Madeira, A. (2024), "Determinants of brand love in wine tourism", *Wine Economics & Policy*, Vol. 13 No. 1, pp. 3-15, doi: 10.36253/wep-13855.

Dunn, K.I., Mohr, P., Wilson, C.J. and Wittert, G.A. (2011), "Determinants of fast-food consumption. An application of the theory of planned behaviour", *Appetite*, Vol. 57 No. 2, pp. 349-357, doi: 10.1016/j.appet.2011.06.004.

Fantechi, T., Califano, G., Caracciolo, F. and Contini, C. (2024), "Puppy power: how neophobia, attitude towards sustainability, and animal empathy affect the demand for insect-based pet food", *Food Research International*, Vol. 177, 113879, doi: 10.1016/j.foodres.2023.113879.

Fornell, C. and Larcker, D.F. (1981), "Evaluating structural equation models with unobservable variables and measurement error", *Journal of Marketing Research*, Vol. 18 No. 1, pp. 39-50, doi: 10.2307/3151312.

Gastaldello, G., Giampietri, E., Zaghini, E. and Rossetto, L. (2022), "Virtual wine experiences: is covid extending the boundaries of wine tourism?", *Wine Economics and Policy*, Vol. 11 No. 2, pp. 5-18, doi: 10.36253/wep-12177.

George, D. and Mallery, P. (2003), *SPSS for Windows Step by Step: A Simple Guide and Reference*, Allyn & Bacon, Boston, Vol. 11, pp. 11-231.

Gerini, F., Fantechi, T., Contini, C., Casini, L. and Scozzafava, G. (2022), "Adherence to the Mediterranean diet and COVID-19: a segmentation analysis of Italian and US consumers", *Sustainability*, Vol. 14 No. 7, p. 3823, doi: 10.3390/su14073823.

Godin, G., Conner, M. and Sheeran, P. (2005), "Bridging the intention–behaviour gap: the role of moral norm", *British Journal of Social Psychology*, Vol. 44 No. 4, pp. 497-512, doi: 10.1348/014466604x17452.

Govaerts, F. and Olsen, S.O. (2022), "Exploration of seaweed consumption in Norway using the norm activation model: the moderator role of food innovativeness", *Food Quality and Preference*, Vol. 99, 104511, doi: 10.1016/j.foodqual.2021.104511.

Grummon, A.H., Musicus, A.A., Salvia, M.G., Thorndike, A.N. and Rimm, E.B. (2023), "Impact of health, environmental, and animal welfare messages discouraging red meat consumption: an online randomized experiment", *Journal of the Academy of Nutrition and Dietetics*, Vol. 123 No. 3, pp. 466-476, doi: 10.1016/j.jand.2022.10.007.

Hu, L.T. and Bentler, P.M. (1999), "Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives", *Structural Equation Modeling: A Multidisciplinary Journal*, Vol. 6 No. 1, pp. 1-55, doi: 10.1080/10705519909540118.

Jang, H.W. and Cho, M. (2022), "Relationship between personal values and intentions to purchase plant-based meat alternatives: application of the dual concern theory", *International Journal of Environmental Research and Public Health*, Vol. 19 No. 14, p. 8673, doi: 10.3390/ijerph19148673.

Kemper, J.A., Benson-Rea, M., Young, J. and Seifert, M. (2023), "Cutting down or eating up: examining meat consumption, reduction, and sustainable food beliefs, attitudes, and behaviors", *Food Quality and Preference*, Vol. 104, 104718, doi: 10.1016/j.foodqual.2022.104718.

Kröger, T., Dupont, J., Büsing, L. and Fiebelkorn, F. (2022), "Acceptance of insect-based food products in western societies: a systematic review", *Frontiers in Nutrition*, Vol. 8, 759885, doi: 10.3389/fnut.2021.759885.

Downloaded from http://ftp.nowpublishers.com/bfj/article-pdf/128/3/939/11301932/bfj-10-2024-1066en.pdf by guest on 18 June 2026

Krystallis, A., de Barcellos, M.D., Kügler, J.O., Verbeke, W. and Grunert, K.G. (2009), "Attitudes of European citizens towards pig production systems", *Livestock Science*, Vol. 126 Nos 1-3, pp. 46-56, doi: 10.1016/j.livsci.2009.05.016.

Lee, J.A., Sneddon, J.N., Daly, T.M., Schwartz, S.H., Soutar, G.N. and Louviere, J.J. (2019), "Testing and extending Schwartz refined value theory using a best–worst scaling approach", *Assessment*, Vol. 26 No. 2, pp. 166-180.

Lin-Schilstra, L. and Fischer, A.R. (2020), "Consumer moral dilemma in the choice of animal-friendly meat products", *Sustainability*, Vol. 12 No. 12, p. 4844, doi: 10.3390/su12124844.

Marinelli, N., Simeone, M. and Scarpato, D. (2015), "Does quality really matter? Variables that drive postmodern consumer choices", *Nutrition & Food Science*, Vol. 45 No. 2, pp. 255-269, doi: 10.1108/nfs-03-2014-0022.

Meriggi, N., Russo, A., Renzi, S., Cerasuolo, B., Nerini, M., Ugolini, A., Marvasi, M. and Cavalieri, D. (2024), "Enhancing seafood traceability: tracking the origin of seabass and seabream from the tuscan coast area by the analysis of the gill bacterial communities", *Animal Microbiome*, Vol. 6 No. 1, p. 13, doi: 10.1186/s42523-024-00300-z.

Mosikyan, S., Dolan, R., Corsi, A.M. and Bastian, S. (2024), "A systematic literature review and future research agenda to study consumer acceptance of novel foods and beverages", *Appetite*, Vol. 203, 107655, doi: 10.1016/j.appet.2024.107655.

Ong, A.K.S., Arriola, R.S.L., Eneria, Z.M.R., Lopez, L.G., Matias, E.A.L., Diaz, J.F.T., German, J.D. and Gumasing, M.J.J. (2024), "3D bioprinted meat: the values-beliefs-norms evaluation of perceived future food source among younger generations", *British Food Journal*, Vol. 126 No. 9, pp. 3505-3528, doi: 10.1108/bfj-03-2024-0283.

Onwezen, M.C. and Dagevos, H. (2023), "A meta-review of consumer behaviour studies on meat reduction and alternative protein acceptance", *Food Quality and Preference*, Vol. 114, 105067, doi: 10.1016/j.foodqual.2023.105067.

Onwezen, M.C., Bouwman, E.P., Reinders, M.J. and Dagevos, H. (2021), "A systematic review on consumer acceptance of alternative proteins: pulses, algae, insects, plant-based meat alternatives, and cultured meat", *Appetite*, Vol. 159, 105058, doi: 10.1016/j.appet.2020.105058.

Peschel, A.O., Thomsen, K., Tsalis, G. and Grunert, K.G. (2024), "The role of ethical orientation in animal welfare choice behaviour: a segmentation study", *Food Quality and Preference*, Vol. 123, 105334, doi: 10.1016/j.foodqual.2024.105334.

Piracci, G., Fantechi, T. and Casini, L. (2024), "Emerging trends in healthy and sustainable eating: the case of fresh convenience plant-based foods", *Plant-Based Food Consumption*, pp. 83-103, doi: 10.1016/b978-0-323-98828-5.00008-5.

Pliner, P. and Hobden, K. (1992), "Development of a scale to measure the trait of food neophobia in humans", *Appetite*, Vol. 19 No. 2, pp. 105-120, doi: 10.1016/0195-6663(92)90014-w.

Schwartz, S.H. (1977), "Normative influences on altruism", in *Advances in Experimental Social Psychology*, Academic Press, Vol. 10, pp. 221-279, doi: 10.1016/s0065-2601(08)60358-5.

Schwartz, S.H. (1992), "Universals in the content and structure of values: theoretical advances and empirical tests in 20 countries", *Advances in Experimental Social Psychology*, Vol. 25, pp. 1-65, doi: 10.1016/s0065-2601(08)60281-6.

Schwartz, S.H., Cieciuch, J., Vecchione, M., Davidov, E., Fischer, R., Beierlein, R.A., Verkasalo, M., Lönnqvist, J., Demirutku, K., Dirilen-Gumus, O. and Konty, M. (2012), "Refining the theory of basic individual values", *Journal of Personality and Social Psychology*, Vol. 103 No. 4, pp. 663-688, doi: 10.1037/a0029393.

Seffen, A.E. and Dohle, S. (2023), "What motivates German consumers to reduce their meat consumption? Identifying relevant beliefs", *Appetite*, Vol. 187, 106593, doi: 10.1016/j.appet.2023.106593.

Simeone, M. and Scarpato, D. (2021), "Consumer perception and attitude toward insects for a sustainable diet", *Insects*, Vol. 13 No. 1, p. 39, doi: 10.3390/insects13010039.

Tso, R., Lim, A.J. and Forde, C.G. (2020), "A critical appraisal of the evidence supporting consumer motivations for alternative proteins", *Foods*, Vol. 10 No. 1, p. 24, doi: 10.3390/foods10010024.

Downloaded from http://ftp.nowpublishers.com/bfj/article-pdf/128/3/939/11301932/bfj-10-2024-1066en.pdf by guest on 18 June 2026

Vajdi, M. and Farhangi, M.A. (2020), "A systematic review of the association between dietary patterns and health-related quality of life", *Health and Quality of Life Outcomes*, Vol. 18, pp. 1-15, doi: 10.1186/s12955-020-01581-z.

Van Loo, E.J., Hoefkens, C. and Verbeke, W. (2017), "Healthy, sustainable and plant-based eating: perceived (mis) match and involvement-based consumer segments as targets for future policy", *Food Policy*, Vol. 69, pp. 46-57, doi: 10.1016/j.foodpol.2017.03.001.

Verneau, F., Caracciolo, F., Coppola, A. and Lombardi, P. (2014), "Consumer fears and familiarity of processed food. The value of information provided by the FTNS", *Appetite*, Vol. 73, pp. 140-146, doi: 10.1016/j.appet.2013.11.004.

Weinrich, R. (2019), "Opportunities for the adoption of health-based sustainable dietary patterns: a review on consumer research of meat substitutes", *Sustainability*, Vol. 11 No. 15, p. 4028, doi: 10.3390/su11154028.

Wilks, M., Hornsey, M. and Bloom, P. (2021), "What does it mean to say that cultured meat is unnatural?", *Appetite*, Vol. 156, 104960, doi: 10.1016/j.appet.2020.104960.

Wongprawmas, R., Mora, C., Pellegrini, N., Guiné, R.P., Carini, E., Sogari, G. and Vittadini, E. (2021), "Food choice determinants and perceptions of a healthy diet among Italian consumers", *Foods*, Vol. 10 No. 2, p. 318, doi: 10.3390/foods10020318.

Xueyun, Z., Mamun, A.A. and Hayat, N. (2024), "Modeling the significance of knowledge, beliefs, and norms on intention to consume plant-based meat alternatives in China", *Food Ethics*, Vol. 9 No. 2, pp. 1-21, doi: 10.1007/s41055-024-00150-0.

Zhang, Y., Wang, Z. and Zhou, G. (2013), "Antecedents of employee electricity saving behavior in organizations: an empirical study based on norm activation model", *Energy Policy*, Vol. 62, pp. 1120-1127, doi: 10.1016/j.enpol.2013.07.036.

Corresponding author
Nicola Marinelli can be contacted at: nicola.marinelli@unifi.it

For instructions on how to order reprints of this article, please visit our website:
www.emeraldgrouppublishing.com/licensing/reprints.htm
Or contact us for further details: **permissions@emeraldinsight.com**

Downloaded from http://ftp.nowpublishers.com/bfj/article-pdf/128/3/939/11301932/bfj-10-2024-1066en.pdf by guest on 18 June 2026