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Research Article

Cultured meat neophobia: Understanding consumer attitudes and behavioral intentions toward an emerging food innovation

Kültür eti neofobisi: Gelişmekte olan bir gıda inovasyonuna karşı tüketici tutumlarını ve davranışsal niyetlerini anlamak

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Abstract

This study examines the impact of cultured meat neophobia on Turkish consumers' attitudes and behavioral intentions, with a focus on understanding the barriers to the acceptance of innovative and sustainable food products. Data obtained from 278 participants were analyzed via partial least squares structural equation modeling (PLS-SEM) performed with SmartPLS. The results reveal that Turkish consumers exhibit cultured meat neophobia, driven by concerns about meat quality, health, safety, and economic factors, which negatively influence attitudes. However, ethical, social, and cultural concerns have no significant impact. Attitudes strongly influence behavioral intention and mediate the relationship between specific dimensions of neophobia and intention, while subjective norms independently affect intention. This study is the first to apply the cultured meat neophobia scale (Tsvakirai et al., 2023) in a different cultural context, offering novel theoretical and empirical insights within the framework of the Theory of Reasoned Action.

Keywords: Cultured Meat Neophobia, Consumer Attitude, Behavioral Intention, Social and Cultural Concerns, Theory of Reasoned Action (TRA)

Jel Codes: D12, Q18, M31

Öz

Bu çalışma, yenilikçi ve sürdürülebilir gıda ürünlerinin kabulü önündeki engelleri anlamaya odaklanarak, kültür eti neofobisinin Türk tüketicilerin tutum ve davranışsal niyetleri üzerindeki etkisini incelemektedir. 278 katılımcıdan elde edilen veriler, SmartPLS programıyla gerçekleştirilen kısmi en küçük kareler yapısal eşitlik modellemesi (PLS-SEM) yöntemiyle analiz edilmiştir. Bulgular, Türk tüketicilerin et kalitesi, sağlık, güvenlik ve ekonomik faktörlerle ilgili kaygılar nedeniyle kültür eti neofobisi sergilediğini ve bunun tüketici tutumlarını olumsuz yönde etkilediğini ortaya koymaktadır. Buna karşın etik, sosyal ve kültürel kaygıların anlamlı bir etkisi bulunmamıştır. Tutumlar, davranışsal niyeti güçlü biçimde etkilemekte ve bazı neofobi boyutları ile davranışsal niyet arasındaki ilişkide aracı rol oynamaktadır. Ayrıca öznel normlar, davranışsal niyet üzerinde bağımsız bir etkiye sahiptir. Bu çalışma, kültür eti neofobi ölçeğini (Tsvakirai vd., 2023) farklı bir kültürel bağlamda uygulayan ilk çalışmadır ve Gerekçeli Eylem Teorisi çerçevesinde yeni teorik ve ampirik içgörüler sunmaktadır.

Anahtar Kelimeler: Kültür Eti Neofobisi, Tüketici Tutumu, Davranışsal Niyet, Sosyal ve Kültürel Kaygılar, Gerekçeli Eylem Teorisi (GET)

JEL Kodları: D12, Q18, M31

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Introduction

One of the significant challenges facing humanity in the coming years is meeting the nutritional needs of the rapidly expanding global population (Hubert, Rosegrant, Van Boekel, and Ortiz, 2010). The projected global population growth to 9.7 billion by 2050, expected to drive a 70% increase in food demand (FAO, 2009; United Nations, 2019), raises serious concerns about the sustainability of current food production systems. This situation intensifies the pressure on the livestock sector, which is responsible for 14.5% of anthropogenic greenhouse gas (GHG) emissions (Gerber et al., 2013).

In addition to environmental impacts, the adverse effects of conventional meat production on animal welfare (Verbeke and Viaene, 2000) and human health (Tang et al., 2017) are central to discussions on sustainability. The increasing demand for meat results in higher water and land usage, contributing to environmental degradation (OECD/FAO, 2023). These concerns have made the development of alternative protein sources an urgent necessity. Cultured meat is an innovative and sustainable alternative to traditional meat production. It is produced by proliferating animal cells under laboratory conditions, transforming them into muscle tissue (Post et al., 2020). Although still in its early stages, cultured meat has the potential to enhance animal welfare (Bryant, van Nek and Rolland, 2020), reduce environmental impacts (Tuomisto and Teixeira de Mattos, 2011), and minimize antibiotic use (Saied et al., 2023). However, debates persist due to uncertainties about energy consumption, carbon dioxide (CO2) emissions (Risner et al., 2024), and long-term health effects (Hocquette, Chriki, Fournier, and Ellies-Oury, 2024).

The adaptation of food consumption habits to innovative products, such as cultured meat, depends not only on technological advancements but also on consumer acceptance (Mancini and Antonioli, 2020). Consumer acceptance can be influenced by food neophobia, defined as the unwillingness to try new foods or avoidance of unfamiliar foods (Pliner and Hobden, 1992). In particular, lab-grown products such as cultured meat may lead to different consumer acceptance due to the impact of production processes on perceptions of naturalness. This could contribute to the emergence of cultured meat neophobia among consumers (Faccio and Guiotto Nai Fovino, 2019). Cultured meat plays a significant role in both local markets and in the transformation of the global food system. Therefore, understanding cultured meat neophobia and its effects on attitudes and intentions is critical for managing market dynamics and addressing environmental, ethical, and health concerns.

In this context, previous studies have typically examined various concerns regarding cultured meat by focusing on specific variables and analysing them separately. These include intrinsic and extrinsic attributes of cultured meat (Mancini and Antonioli, 2019), environmental, animal welfare, and health concerns (Marcus, Klink-Lehmann and Hartmann, 2022), emotional responses such as perceptions of unnaturalness and disgust (Verbeke et al., 2015), ethical advantages, perceived unnaturalness and global diffusion optimism (Weinrich, Strack and Neugebauer, 2020), as well as food neophobia and ethical sensitivity (Bryant, Szejda, Parekh, Deshpande and Tse, 2019; Wilks, Phillips, Fielding and Hornsey, 2019). On the other hand, Wang and Scrimgeour (2023) included multiple dimensions in a single model but evaluated these variables within the framework of general meat choice motives. The Cultured Meat Neophobia Scale used in this study (Tsvakirai, Nalley, and Makgopa, 2023) integrates concerns related to quality, health, safety, ethics, and social, cultural, and economic aspects into a single, multidimensional structure. This enables a detailed evaluation of context-specific nuances.

Few studies have addressed consumer acceptance of cultured meat in developing countries, such as Türkiye (Baran, 2020; Aydemir, Okan and Takım, 2023; Baybars, Ventura and Weinrich, 2023; Kumru and Demir, 2024). Türkiye's sociocultural structure, predominantly shaped by its Muslim identity, renders halal food sensitivities (Nişancı, 2023) and deep-rooted traditional meat consumption practices, which are particularly significant in terms of consumer attitudes. These cultural and religious factors may lead Turkish consumers to adopt a cautious stance toward innovative food products such as cultured meat. Given that livestock production is predominantly conducted by small-scale family enterprises and represents a crucial economic resource in rural areas (İlter, 2019), the adoption of innovative meat alternatives is critical from both the economic and social perspectives. Consequently, the lack of research on cultured meat neophobia in Türkiye constitutes a significant research gap in understanding the barriers to consumer acceptance of innovative foods and developing sustainable food policies.

This study aims to explore the effects of cultured meat neophobia dimensions (meat quality, health and safety, ethical, social, cultural, and economic concerns) on consumers' attitudes toward cultured meat and their consumption intentions. Furthermore, it examines the mediating role of attitudes in the

relationship between these dimensions and consumption intention, as well as the influence of subjective norms on the intention to consume cultured meat.

The current study proposes and tests a model based on the Theory of Reasoned Action (TRA) using PLS-SEM to elucidate the effects of cultured meat neophobia on attitudes and consumption intentions. The findings offer various theoretical implications for policymakers, businesses, and the hospitality sector, as well as practical recommendations for developing sustainable food policies.

The remainder of the paper is structured as follows. The study begins by examining the relevant literature, which provides the foundation for the research. This is followed by the development of the conceptual framework and the formulation of research hypotheses. The research methodology is then described, including data collection and analytical procedures. The empirical findings are subsequently presented and discussed in terms of their theoretical and practical implications. The paper concludes by addressing the study's limitations and offering suggestions for future research.

Literature review

Growing environmental and ethical concerns regarding traditional meat production, coupled with the quest to meet future food demands sustainably, are making cultured meat an important alternative (FAO, 2009; Mancini and Antonioli, 2020). Despite the potential advantages of cultured meat technology, consumers face numerous barriers to adopting this innovative product. While some of these barriers are psychological, such as food neophobia (Pliner and Hobden, 1992), others emerge as ethical, sensory and various concerns specific to the context of cultured meat (Verbeke et al., 2015).

Although most studies have highlighted that concerns about the sensory properties of cultured meat, such as taste, texture, and appearance, may hinder consumer acceptance (Dean et al., 2024; Mancini and Antonioli, 2019; Verbeke et al., 2015; Wilks and Phillips, 2017), some researchers argue that these perceptions are likely to evolve (Bryant and Barnett, 2018; Siegrist and Sütterlin, 2017). Tucker (2014) stated that the lack of sensory appeal is the primary factor for the rejection of cultured meat. However, as most studies lack sensory testing, consumer perceptions are formed without real tasting experiences. Therefore, while concerns about meat quality are the most concrete manifestation of cultured meat neophobia, they interact with other factors, such as perceptions of health and safety.

Health risks and distrust of lab-grown foods are widely recognized as critical factors influencing the acceptance of cultured meat (Siegrist and Hartmann, 2020). Some consumers perceive cultured meat as less healthy (Siegrist and Sütterlin, 2017) and unsafe (Laestadius and Caldwell, 2015) than conventional meat. On the other hand, some studies have suggested that cultured meat may be perceived as safer than traditional meat due to its advantages, such as reduced antibiotic use (Saied et al., 2023), which could potentially encourage consumers to incorporate it into their diets (Szejda, Bryant and Urbanovich, 2021). However, the ambiguity regarding the potential long-term health impacts of cultured meat (Hocquette et al., 2024) may intensify people's resistance to trying new foods.

Studies highlight the significant contributions of cultured meat to animal welfare (Bryant et al., 2020; Weinrich et al., 2020). However, these contributions may not provide strong motivation for individuals with high meat consumption levels to make a sudden dietary change (Hopkins and Dacey, 2008). Uncertainties in energy use and CO2 emissions (Lynch and Pierrehumbert, 2019; Risner et al., 2024) may limit perceived environmental benefits. Consumers believe that such uncertainties could weaken ethical perceptions (Gómez-Luciano, de Aguiar, Vriesekoop and Urbano, 2019). Nevertheless, research is needed to address how ethical concerns contribute to the neophobia associated with cultured meat.

Social environment, beliefs, and cultural habits significantly influence food choices. Understanding social and cultural concerns is critical for the acceptance of cultured meat. For instance, Motoki, Park, Spence and Velasco (2022) emphasized that the intimate social environment (family, friends, and partners) shapes its acceptability, while Hamdan, Post, Ramli and Mustafa (2018) noted that its production method may raise religious concerns. Similarly, consumers in countries that prioritize preserving food traditions and cultural heritage, such as France, tend to exhibit less openness to cultured meat consumption (Siegrist and Hartmann, 2020). However, more comprehensive research is needed to investigate how social and cultural factors influence the acceptance of these practices. The cultured meat neophobia scale effectively addresses these concerns, filling a significant gap in the literature.

Price perception and consumers' willingness to pay are critical for the adoption of new technologies such as cultured meat (Shen and Chen, 2020). The proliferation of cultured meat may drive traditional producers toward more intensive practices owing to competition, potentially compromising animal welfare (Mancini and Antonioli, 2022). These concerns may be further exacerbated by apprehensions

regarding the continuity of rural activities and potential job loss (Morais-da-Silva, Reis, Sanctorum, and Molento, 2022; Tubb and Seba, 2021). Nonetheless, some consumers perceive this shift as a transformation of the workforce and the development of a new industry rather than as a threat to job losses (Newton and Blaustein-Rejto, 2021). Nevertheless, neophobic reactions driven by economic concerns require thorough examination.

These studies have examined various variables, including the sensory properties of cultured meat, animal welfare, safety concerns, health concerns, and environmental concerns. Studies have also addressed food neophobia in the context of cultured meat (Bryant et al., 2019; Wilks et al., 2019; Dupont, Harms and Fiebelkorn, 2022; Siegrist and Hartmann, 2020). However, these concerns have typically been examined by focusing on specific variables and addressing them separately. Although Wang and Scrimgeour (2023) developed a broader framework that incorporates multiple dimensions, such as health, safety, and environmental concerns, they evaluated these within the scope of general meat choice motives.

This study distinguishes itself in the literature by employing the Cultured Meat Neophobia Scale (Tsvakirai et al., 2023), which was specifically developed for the context of cultured meat. This framework addresses the multidimensional concerns specific to cultured meat through an integrated and comprehensive approach, thereby enabling a more nuanced evaluation of context-specific details. Thus, this study aims to understand the multidimensional structure of cultured meat neophobia, examine its effects on attitudes and intentions, and provide significant insights within the Turkish context, thereby addressing an existing gap in the literature.

Conceptual framework and hypotheses

Cultured meat neophobia

Cultured meat neophobia is a concept encompassing consumers' multidimensional concerns about cultured meat (Tsvakirai et al., 2023). These concerns have been examined either separately or partially in previous studies (Bryant and Dillard, 2019; Verbeke et al., 2015). However, a comprehensive and multidimensional examination of fundamental consumer concerns reflecting nuances specific to cultured meat is essential to understanding the critical factors influencing product acceptance. Cultured meat neophobia encompasses concerns related to meat quality, health and safety, ethics, social and cultural aspects, and economic implications (Tsvakirai et al., 2023).

Meat quality concerns

Meat quality concerns involve consumers' negative perceptions of the sensory appeal of meat, including taste, texture, and appearance. These attributes have a significant influence on consumers' food preferences and purchasing decisions (Dean et al., 2024; Verbeke et al., 2015). The similarity between cultured meat and conventional meat plays a critical role in consumer acceptance (Siegrist and Hartmann, 2020). When familiarity with novel foods is low, these uncertainties may lead to negative expectations (Piqueras-Fiszman and Spence, 2015). Accordingly, it is anticipated that consumers' concerns about meat quality could result in negative attitudes toward cultured meat. Accordingly, the following hypothesis is proposed:

H_1: *Meat quality concerns negatively affect consumer attitudes toward cultured meat.*

Health and safety concerns

Cultured meat, which is not yet widely available in the market and remains under development, significantly increases consumers' uncertainty regarding its health and safety (Verbeke et al., 2015). These concerns are further exacerbated by the potential long-term health effects of the product, genetic modifications used during production, the possibility of antibiotic usage, uncertainties regarding ingredient transparency, and gaps in existing legal and regulatory frameworks (Laestadius and Caldwell, 2015; Verbeke et al., 2015). Moreover, the multi-stage production and processing procedures of cultured meat entail risks of contamination or technical failure (Petetin, 2014). The absence of comprehensive scientific data and consumers' unfamiliarity with laboratory-based food production methods reinforce skepticism regarding the long-term health and safety implications of cultured meat. Therefore, the following hypothesis is suggested:

H_2: *Health and safety concerns negatively affect consumer attitudes toward cultured meat.*

Ethical concerns

Cultured meat significantly minimizes animal slaughter and thus contributes to animal welfare (Bryant et al., 2020). It is also presented as an environmentally friendly alternative to conventional meat

production. However, this comparison remains controversial, particularly regarding long-term environmental impacts, such as reduced greenhouse gas (GHG) and water consumption (Lynch and Pierrehumbert, 2019). Although some studies support the environmental benefits of cultured meat (Tuomisto and Teixeira de Mattos, 2011), the analysis by Risner et al. (2024) indicates that cultured meat production may pose a higher environmental burden than conventional meat, mainly due to the substantial carbon footprint of growth factors.

Given these uncertainties, the environmental impacts of cultured meat may weaken consumers' ethically motivated positive perceptions and contribute to increased levels of cultured meat neophobia. Accordingly, the following hypothesis is proposed:

H_3: *Ethical concerns negatively affect consumer attitudes toward cultured meat.*

Social and cultural concerns

Social and cultural concerns encompass individuals' concerns related to social acceptance, religious norms, and societal perceptions regarding the consumption of cultured meat (Tsvakirai et al., 2023). In environmental and social contexts, specific concerns can shape consumers' attitudes toward food (Larson and Story, 2009). The perception that one's social environment may not accept cultured meat (Motoki et al., 2022) and concerns related to its production method (Hamdan et al., 2018) could contribute to increased neophobia towards cultured meat. In this context, it is hypothesised that social and cultural concerns may lead to the development of negative attitudes toward cultured meat.

H_4: *Social and cultural concerns negatively affect consumer attitudes toward cultured meat.*

Economic concerns

Although cultured meat is often promoted as a sustainable and ethical alternative to conventional meat, its potential socio-economic implications have raised various concerns among consumers and stakeholders. Primary among these concerns is the possibility that the widespread adoption of cultured meat may economically undermine traditional livestock farming and related sectors, thereby increasing the risk of unemployment in rural areas (Chriki et al., 2021; Verbeke et al., 2015; Tubb and Seba, 2021). The capital-intensive nature of cultured meat production and its concentration in high-tech firms may reduce employment opportunities in rural areas, disrupt existing agri-food systems, and lead to income losses across the distribution network (Chriki, Ellies-Oury and Hocquette, 2022; Mancini and Antonioli, 2022). Moreover, concerns have been raised that the current scale and affordability of cultured meat production may fall short of addressing global food insecurity in the near future (Mattick and Allenby, 2013).

The potential marginalization of traditional producers, increasing centralization of the sector, and the disruption of economic balance may reinforce negative consumer attitudes toward cultured meat. In this context, the following hypothesis is proposed:

H_5: *Economic concerns negatively affect consumer attitudes toward cultured meat.*

Theory of Reasoned Action (TRA)

The research model proposed in this study draws on the Theory of Reasoned Action (TRA), developed by Fishbein and Ajzen (1975), which explains behavioral intentions primarily through attitudes and subjective norms. Attitude is defined as an individual's positive or negative evaluation of behavior (Ajzen, 1991; Trafimow, 2009). In this study, attitude refers to consumers' favorable assessment of cultured meat. Studies have demonstrated that positive attitudes positively influence behavioral intention (Jang and Cho, 2022; Thangavelu, Hyland, Henchion, Kerry, and Álvarez, 2022), whereas negative attitudes elicit adverse outcomes (Baybars et al., 2023; Shen and Chen, 2020; Wilks and Phillips, 2017). Subjective norms refer to the perceived social pressure to perform or refrain from performing a specific behavior, originating from the opinions of significant others, such as family and friends, within an individual's social environment (Ajzen, 1991). Positive subjective norms strengthen behavioral intentions (Jang and Cho, 2022; Marcus et al., 2022). Given that food choices are deeply embedded in cultural traditions and ethical considerations, subjective norms play a particularly critical role in shaping consumer responses toward novel foods, such as cultured meat. This cultural dimension is especially pronounced in Türkiye, where traditional animal agriculture has significant economic, social, and symbolic meaning.

While previous studies have successfully applied TRA to novel food acceptance contexts, such as organic food (Basha and Lal, 2019) and lab-grown meat (Castellani, Cassia, Vargas-Sánchez and Giaretta, 2025), integration of neophobic reactions toward cultured meat within the TRA framework remains limited. Thus, this study applies the TRA by incorporating cultured meat neophobia, a

multidimensional concept encompassing quality, health, safety, ethical, social, cultural, and economic concerns, to capture better how context-specific barriers influence consumer attitudes and intentions. Prior research suggests that such concerns can substantially shape consumer attitudes toward novel food technologies (Bryant et al., 2019; Wang and Scrimgeour, 2023). Thus, based on the explanations presented above, the following hypotheses are proposed:

H_6: *Attitude positively influences consumers' intentions to consume cultured meat.*

H_7: *Subjective norm positively influences consumers' intentions to consume cultured meat.*

H_8: *Attitude mediates the relationship between the dimensions of cultured meat neophobia [i.e., meat quality concerns (H_{8a}), health and safety concerns (H_{8b}), ethical concerns (H_{8c}), social and cultural concerns (H_{8d}), and economic concerns (H_{8e})] and consumers' intentions to consume cultured meat.*

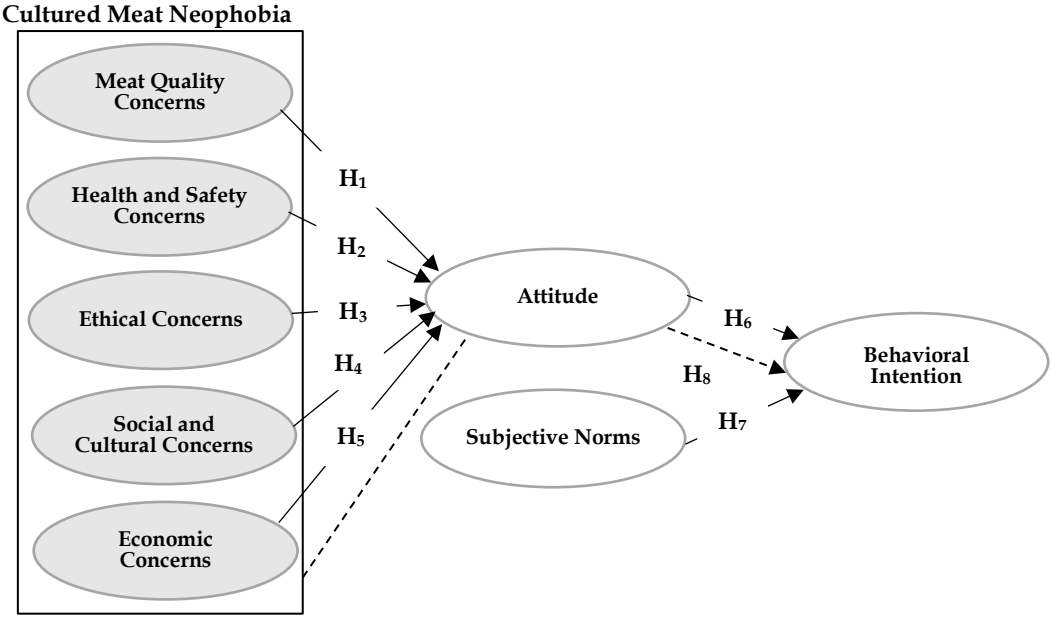

Figure 1: Research Model

Note: The dotted line (H8) represents the mediation paths from the five dimensions of cultured meat neophobia (i.e., meat quality, health and safety, ethical, social and cultural, and economic concerns) to behavioral intention through attitude.

Materials and method

Survey design and data collection

This study employs a quantitative research approach using convenience sampling and an online survey. Data were collected between October 31 and November 9, 2024, via Google Forms distributed through social media platforms. Participants were first presented with an informed consent form, and those who agreed to the conditions proceeded to complete the survey. After excluding inattentive responses, 278 valid responses were retained from 304 participants. As a first step in developing the survey, two individuals proficient in both languages translated the English scales into Turkish. The translations were reviewed, and differences were resolved to create the final Turkish version. A bilingual expert translated the Turkish version back to English to ensure the quality and conceptual equivalence of the translations. The back-translated items were compared with the original items to confirm their consistency.

Scales

The online survey consisted of five sections. The first section began with demographic questions, followed by questions on dietary habits and frequency of meat consumption. The second section assessed the participants' awareness of cultured meat and related terminology (participants could select multiple options). The third section provided a brief explanation and a photo of the characteristics and production processes of cultured meat. This approach ensured that participants unfamiliar with the concept could provide meaningful answers to the remaining questions. The fourth section employed the Cultured Meat Neophobia Scale, adapted from Tsvakirai et al. (2023), which comprises 20 items addressing concerns related to the quality, health and safety, ethics, social and cultural aspects, and economics of cultured meat. The final section employed three scales: a three-item attitude scale adapted from Maichum, Parichatnon, and Peng (2016), a three-item subjective norms scale from Chen (2022),

and a four-item behavioral intention scale from Hoang, Chovancová, and Hoang (2022). The items were rated on a 5-point Likert scale ranging from 1("strongly disagree") to 5 ("strongly agree").

Data analysis

Descriptive statistics were analyzed using IBM SPSS 22 software. The evaluation of the research model, which included Confirmatory Factor Analysis (CFA) as part of the measurement model evaluation, was conducted using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 4 software. PLS-SEM is a statistical method developed to analyze multiple relationships simultaneously in a conceptual framework (Henseler, Ringle and Sarstedt, 2015). This method was chosen because of its ability to estimate complex models, handle small sample sizes, and address mediation effects (Hair, Hult, Ringle, and Sarstedt, 2022).

Findings

Descriptive statistics

Table 1 displays the demographic information of the study participants. Among the participants, 65.1% were female. The majority of participants were students (80.92%), and 70.9% were under the age of 22. Over half of the participants reported a monthly income of less than 30,000 TRY. (USD 875; USD 1 = TRY 34.27, as of October 2024). Consequently, the purchasing power of the participants was significantly above the national average of USD 495 by 2023 (TURKSTAT, 2023).

When participants were asked about their dietary habits, 7.2% reported following a flexitarian diet and 90.6% were identified as omnivorous. Regarding weekly meat consumption, only 3.6% of the participants reported consuming no meat. As shown in Table 1, the majority (55.4%) reported consuming meat two to three times per week.

Additionally, the participants were asked about their awareness of cultured meat and its associated terminology. Only 19.8% of the participants reported having heard of cultured meat, whereas the remaining 80.2% stated that they were unfamiliar with the term. Participants generally demonstrated a very low awareness of terms such as clean meat (51.44%), cell-based meat (2.88%), synthetic meat (15.46%), and in vitro meat (30.22%). The findings are summarized in Table 1.

Table 1: Demographic Characteristics

Household Income (month/TL) *	**N**	**%**	**Age**	**N**	**%**
10000 TL-	63	22.7	18-21	197	70.9
10001- 20000 TL	65	23.4	22-29	31	11.2
20001- 30000 TL	39	14.0	30-39	21	7.6
30001- 40000 TL	33	11.9	40-49	13	4.7
40001- 50000 TL	21	7.6	50+	16	5.8
50001- 60000 TL	22	7.9	Total	278	100.0
60001- 70000 TL	12	4.3	**Highest level of education completed**	**N**	**%**
70001 TL+	23	8.3	Primary School	2	0.7
Total	278	100.0	Secondary School	200	71.9
Occupation	**N**	**%**	Associate Degree	11	4.0
Academician	8	2.88	Graduate	42	15,1
Engineer	6	2.16	Master's Degree	17	6.1
Civil Cervant	11	3.96	Doctorate (PhD)	6	2.2
Student	225	80.92	Total	278	100.0
Teacher	6	2.16	**Dietary Habit**	**N**	**%**
Self-Employment	3	1.08	Flexitarian	20	7.2
Manager	4	1.44	Omnivore	252	90.6
Housewife	3	1.08	Vegan	1	0,4
Accountant	2	0.72	Vegetarian	5	1,8
Retired	8	2.88	Total	278	100.0
Unemployed	2	0.72	**Frequency of eating meat per week**	**N**	**%**
Total	278	100.0	Never	10	3.6
Marital Status	**N**	**%**	Once a week	88	31.7
Single	234	84.17	Two or three times a week	154	55.4
Married	42	15.11	Four or more times a week	21	7.6
Divorced	2	0.72	Everyday	5	1.8
Total	278	100.0	Total	278	100.0
Have you ever heard of cultured meat?	**N**	**%**	**Which of the following terms have you heard of?**	**N**	**%**
Yes	55	19.8	Clean Meat	143	51.44
No	223	80.2	Cell-based Meat	8	2.88
Total	278	100.0	Synthetic Meat	43	15.46
Gender	**N**	**%**	In Vitro Meat	84	30.22
Female	181	65.1	Total	278	100.0
Male	97	34.9			
Total	278	100.0			

Note: *Minimum wage in Türkiye for the year 2024 was 17.000 TL.

Measurement model

As part of the validity and reliability analyses, internal consistency reliability, convergent validity, and discriminant validity were evaluated. To assess internal consistency reliability, Composite Reliability (CR) coefficients were utilized. Convergent validity was assessed through factor loadings and average variance extracted (AVE) values. It is recommended that factor loadings should be ≥ 0.70, composite reliability coefficients ≥ 0.70, and AVE ≥ 0.50 (Hair, Black, Babin, Anderson, and Tatham, 2019; Hair et al., 2022). The results of the measurement model are presented in Table 2.

Table 2: Measurement Model Results

Item	Loading	CR	AVE
Meat Quality Concerns		0.884	0.660
MQC1	0.858		
MQC2	0.866		
MQC3	0.861		
MQC4	0.641		
Health and Safety Concerns		0.882	0.603
HSC1	0.703		
HSC2	0.854		
HSC3	0.863		
HSC4	0.801		
HSC5	0.638		
Ethical Concerns		0.693	0.530
ETC1	0.687		
ETC2	0.768		
Social and Cultural Concerns		0.862	0.615
SCC1	0.570		
SCC2	0.860		
SCC3	0.896		
SCC4	0.771		
Economic Concerns		0.846	0.647
EC1	0.761		
EC2	0.828		
EC3	0.821		
Attitude		0.946	0.855
ATT1	0.925		
ATT2	0.926		
ATT3	0.922		
Subjective Norms		0.857	0.669
SN1	0.883		
SN2	0.876		
SN3	0.678		
Behavioral Intention		0.971	0.893
BI1	0.925		
BI2	0.959		
BI3	0.963		
BI4	0.932		

Notes: CR=Composite Reliability, AVE=Average Variance Extracted.

Hair et al. (2022) suggest that factor loadings should be ≥0.70 and that items with factor loadings lower than 0.40 should be excluded from the measurement model. Additionally, they indicated that items with factor loadings between 0.40 and 0.70 should be removed if the AVE or CR values of the corresponding construct do not meet the threshold. In this research, it was found that the factor loadings of the item "*My religion discourages me from eating cultured meat*" under the dimension of social and cultural concerns and the item "*The introduction of cultured meat will not help avoid food shortage problems*" under the dimension of economic concerns was below 0.40. These items were removed from the model, and the analyses were repeated. According to Table 2, all items have factor loadings above 0.50 (Hair et al., 2019). Based on the analysis results, although the factor loadings for items MQC4, HSC5, ETC1, SCC1, and SN3 were calculated below the threshold value, these items were retained in the measurement model, as their respective constructs' AVE and CR values were above the threshold.

The CR coefficients of the constructs, which ranged from 0.693 to 0.971, confirmed internal consistency reliability. Convergent validity was demonstrated through factor loadings ranging from 0.570 to 0.963 and AVE values between 0.530 and 0.893.

Discriminant validity was evaluated based on the criteria proposed by Fornell and Larcker (1981) and the Heterotrait-Monotrait Ratio (HTMT) suggested by Henseler et al. (2015). To establish discriminant validity, the square roots of AVE values should exceed the correlations between constructs. The Fornell and Larcker (1981) results are presented in Table 3, and the HTMT coefficients are listed in Table 4.

Table 3: Discriminant Validity (Fornell-Larcker Criterion)

	ATT	PI	EC	ETC	HSC	MQC	SCC	SN
ATT	**0.925**							
PI	0.697	**0.945**						
EC	-0.391	-0.304	**0.804**					
ETC	-0.190	-0.202	0.127	**0.728**				
HSC	-0.498	-0.464	0.395	0.156	**0.777**			
MQC	-0.470	-0.404	0.308	0.055	0.640	**0.812**		
SCC	-0.127	-0.106	0.043	-0.012	0.126	0.137	**0.784**	
SN	0.597	0.610	-0.225	-0.043	-0.395	-0.288	0.165	**0.818**

The results in Table 3 demonstrate that discriminant validity has been established.

Table 4: Discriminant Validity (HTMT)

	ATT	PI	EC	ETC	HSC	MQC	SCC	SN
ATT								
PI	0.743							
EC	0.470	0.355						
ETC	0.580	0.606	0.470					
HSC	0.569	0.516	0.501	0.777				
MQC	0.540	0.453	0.392	0.840	0.782			
SCC	0.111	0.093	0.050	0.202	0.122	0.144		
SN	0.708	0.708	0.280	0.197	0.480	0.363	0.183	

Discriminant validity among constructs was verified using the Heterotrait-Monotrait Ratio (HTMT) suggested by Henseler et al. (2015). The authors recommend that HTMT values remain lower than 0.90 for constructs that are conceptually similar and below 0.85 for constructs that are conceptually different. The HTMT coefficients presented in Table 4 are below these thresholds. Based on the results presented in Tables 3 and 4, discriminant validity was achieved.

Common method bias (CMB) was evaluated by examining the variance inflation factor (VIF) values within the inner model. As shown in Table 5, all VIF values were below 3.33, confirming the absence of CMB (Kock, 2015).

Structural equation modeling (SEM) analysis results

Figure 2 illustrates the (SEM) developed to test the hypotheses of the study.

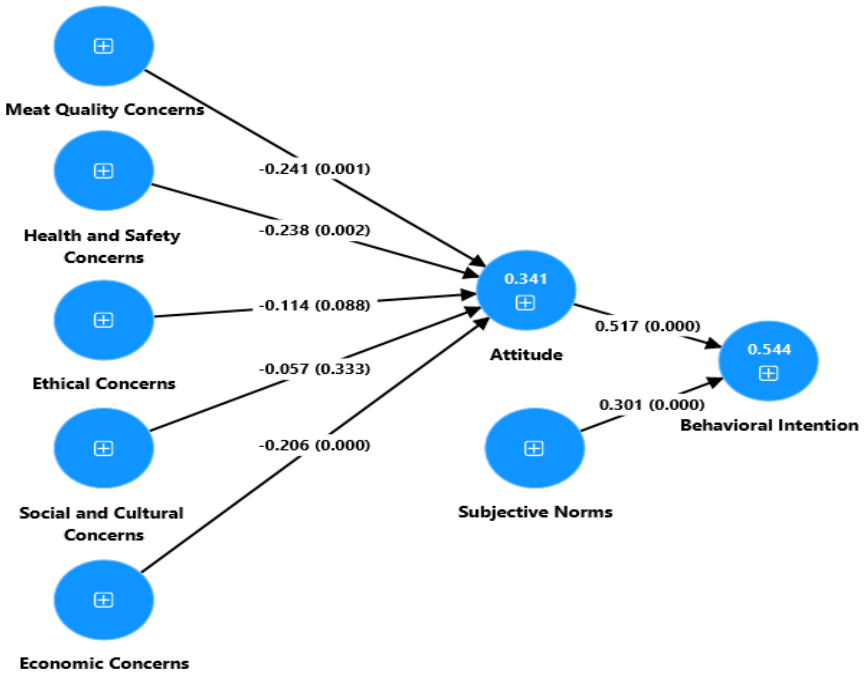

Figure 2: Structural Model

The structural equation model was assessed through Partial Least Squares Structural Equation Modeling (PLS-SEM). Data were processed using SmartPLS 4 statistical software (Ringle, Wende and Becker, 2022; Yıldız, 2021). The analyses conducted for the research model included linearity, path coefficients, R^2 effect size (f^2), and predictive relevance (Q^2). To determine the significance levels of the PLS path coefficients, the bootstrapping technique, which generated 10,000 subsamples from the data,

was applied (Hair et al., 2022). Table 5 presents the findings obtained from the analysis of the research model.

Table 5: Research Model Results

Constructs	VIF	R^2	f^2	Q^2
ATT → BI	1.554	0.544	0.377	0.408
SN → BI	1.554		0.128	
EC → ATT	1.200	0.341	0.054	0.303
ETC → ATT	1.036		0.019	
HSC → ATT	1.866		0.046	
MQC → ATT	1.720		0.051	
SCC → ATT	1.022		0.005	

VIF values were below five, as shown in Table 5, indicating no multicollinearity issues (Hair et al., 2022). The Model's R^2 values revealed that behavioral intention and attitude were explained at 54.4% and 34.1%, respectively. The effect size coefficient (f^2) was evaluated as low (≥ 0.02), medium (≥ 0.15), and high (≥ 0.35) (Cohen, 1988). According to Sarstedt, Ringle and Hair (2017), coefficients below 0.02 have no meaningful effect. Analysis of the effect size coefficients (f^2) demonstrated that attitude had a high effect and subjective norms had a low impact on behavioral intention. Additionally, the EC, HSC, and MQC exhibited low effects on attitude. Furthermore, Q^2 values in Table 5 greater than zero demonstrate that the predictive power of the research model is at a satisfactory level (Hair et al., 2022).

The results of hypothesis testing for the research model are reported in Table 6.

Table 6: Hypothesis Testing Results

Hypotheses	β	SD	t-values	p-values	Results
MQC → ATT	-0.241	0.071	3.397	0.001	H1: Supported
HSC → ATT	-0.238	0.077	3.077	0.002	H2: Supported
ETC → ATT	-0.114	0.067	1.706	0.088	H3: Not Supported
SCC → ATT	-0.057	0.059	0.967	0.333	H4: Not Supported
EC → ATT	-0.206	0.055	3.746	0.000	H5: Supported
ATT → BI	0.517	0.057	8.999	0.000	H6: Supported
SN → BI	0.301	0.064	4.717	0.000	H7: Supported
MQC → ATT → BI	-0.124	0.039	3.174	0.002	H8a: Supported
HSC → ATT → BI	-0.123	0.042	2.932	0.003	H8b: Supported
ETC → ATT → BI	-0.059	0.035	1.684	0.092	H8c: Not Supported
SCC → ATT → BI	-0.029	0.030	0.966	0.334	H8d: Not Supported
EC → ATT → BI	-0.106	0.032	3.346	0.001	H8e: Supported

According to the results in Table 6, meat quality concerns were found to have a statistically significant effect on attitude ($\beta = -0.241$, $p < 0.001$), supporting Hypothesis $_1$. Similarly, health and safety concerns were also found to have a statistically significant effect on attitude ($\beta=-0.238$; $p<0.001$), confirming H_2. However, ethical concerns ($\beta=-0.114$; $p>0.05$) and social and cultural concerns ($\beta=-0.057$; $p>0.05$) were found to have no significant effect on attitude. Therefore, the relationships proposed in H_3 and H_4 are not supported. Economic concerns had a statistically significant impact on attitude ($\beta = -0.206$, $p < 0.001$), supporting Hypothesis $_5$. Regarding the effects proposed in H_6 and H_7, both the impact of attitude on behavioral intention ($\beta=0.517$; $p<0.001$) and the influence of subjective norms on behavioral intention ($\beta=0.301$; $p<0.001$) were found to be statistically significant. Therefore, both hypotheses were supported.

In this study, hypotheses H_{8a}, H_{8b}, H_{8c}, H_{8d}, and H_{8e}, which propose the mediating role of attitude in the effects of meat quality concerns, health and safety concerns, ethical concerns, social and cultural concerns, and economic concerns on behavioral intention, were also tested. The results of the analysis indicate that attitude plays a mediating role in the effect of meat quality concerns ($\beta=-0.124$; $p<0.001$), health and safety concerns ($\beta=-0.123$; $p<0.001$), and economic concerns ($\beta=-0.106$; $p<0.001$) on behavioral intention, confirming the relationships proposed in hypotheses H_{8a}, H_{8b}, and H_{8e}. However, the results revealed that attitude did not have a statistically significant mediating effect on the

relationship between ethical concerns (β = -0.059; p > 0.05) and social and cultural concerns (β = -0.029; p > 0.05) on behavioral intention. Therefore, the relationships proposed in hypotheses H_{8c} and H_{8d} are not supported.

Discussion

Our study examined the effects of the dimensions of cultured meat neophobia on consumer attitudes and consumption intentions. The findings demonstrated that meat quality, health and safety concerns, and economic concerns were determinants of consumer attitudes and indirectly influenced intention. These results reveal that cultured meat neophobia, specifically these three dimensions, constitutes a substantial barrier to consumer attitudes.

The findings of our study support previous studies emphasizing the critical role of meat quality concerns in consumer acceptance (Verbeke et al., 2015; Mancini and Antonioli, 2019; Wilks and Phillips, 2017; Gómez-Luciano et al., 2019; Dean et al., 2024; Tsvakirai et al., 2023). Cultured meat producers should adopt strategies to enhance the sensory quality of their products. Similarly, health and safety concerns significantly influenced negative consumer attitudes, consistent with prior research (Laestadius and Caldwell, 2015; Siegrist and Sütterlin, 2017). To increase consumer confidence, more information about health and safety should be provided, and a transparent communication strategy should be adopted. Economic concerns emerged as a significant factor shaping consumers' negative attitudes toward cultured meat consumption. This finding aligns with Tsvakirai et al. (2023), who emphasized the role of economic concerns in increasing cultured meat neophobia. Combined with potential impacts on conventional meat producers (Wilks and Philips, 2017), economic uncertainties intensify concerns. This finding also provides insight into how the local economic context influences cultured meat neophobia, reflecting the significant role of the livestock sector across Türkiye.

On the other hand, ethical, social, and cultural concerns showed no significant influence on consumer attitudes. In contrast, prior studies (Bryant et al., 2020; Weinrich et al., 2020; Marcus et al., 2022; Tsvakirai et al., 2023) indicated that ethical concerns are among the significant factors shaping consumer attitudes. Ethical concerns may increase the interest in meat alternatives. Nevertheless, the novelty of cultured meat and its limited market availability may have hindered the development of consumers' ethical, social, and cultural perceptions. In particular, the younger sample's greater flexibility in social judgments may have contributed to shaping these findings. These results suggest that cultured meat is perceived as a product that has not yet matured in society, which may limit the impact of ethical, social, and cultural concerns on consumer attitudes.

Ultimately, our findings indicate that attitudes and subjective norms have a significant influence on the intention to consume cultured meat. This result is consistent with Fishbein and Ajzen's TRA (1975) (Castellani et al., 2025; Cheah, Shimul, Liang and Phau, 2020; Dupont et al., 2022; Marcus et al., 2022). Additionally, concerns about quality, health and safety, and economics indirectly influenced behavioral intention via attitudes, whereas ethical, social and cultural concerns showed no mediating effect. These findings underscore that quality, health, safety, and economic concerns play a substantial role in shaping consumer decisions. Nevertheless, the positive impact of attitude on behavioral intention emerges as a significant mechanism shaping consumers' behavioral intention despite neophobic concerns. This suggests attitude is critical for accepting innovative products such as cultured meat. In this context, the current study supports the validity of the Theory of Reasoned Action (TRA). It makes a meaningful contribution to the literature on the psychological mechanisms that shape consumption behavior toward innovative products.

Complementary to these findings, participants' dietary habits, weekly meat consumption and awareness of cultured meat terminology were examined. The findings indicate that regular meat consumption (two or three times a week, 55%) may contribute to the development of more cautious attitudes toward innovative products, such as cultured meat. Further analysis is needed to gain a deeper understanding of this relationship. Moreover, most participants (80.2%) were unfamiliar with cultured meat, but 51.44% had heard of the term 'clean meat'. This aligns with studies showing the term 'clean meat' can enhance consumer acceptance (Bryant and Barnett, 2019; Marshall, Bano and Banas, 2022).

Theoretical implications

This study offers meaningful contributions to the literature on food innovation and cultured meat. First, it provides empirical support to the literature by examining the validity and reliability of the Cultured Meat Neophobia Scale (Tsvakirai et al., 2023) in a different geographical and cultural context for the first time, using data from Türkiye. Second, the study addresses the multidimensional concerns underlying cultured meat neophobia, thereby enabling a more nuanced understanding of how context-

specific individual and social concerns shape consumer decision-making. Third, it builds upon the existing literature (Pliner and Hobden, 1992) by testing the multidimensional structure of cultured meat neophobia within the framework of the Theory of Reasoned Action (TRA; Fishbein and Ajzen, 1975) and demonstrating its applicability in this context. Fourth, concerns regarding economic, health and safety, and quality factors were found to affect consumer attitudes, supporting and extending earlier studies significantly (Verbeke et al., 2015; Mancini and Antonioli, 2019). Additionally, the positive effect of attitude on behavioral intention suggests that consumers are not entirely opposed to cultured meat consumption despite these concerns. This highlights the central role of attitudes in shaping the acceptance of innovative food products. Furthermore, the lack of impact of social and cultural concerns on attitudes suggests that individually held social concerns may be of secondary importance in consumers' decision-making processes. Meanwhile, the positive effect of subjective norms reinforces the relevance of social influence in the adoption of innovative products within the Theory of Reasoned Action (TRA) framework. Finally, by examining perceptions of cultured meat across different socio-economic and cultural contexts, this study provides new insights into consumer behavior in emerging markets. It enriches the literature with a broader contextual understanding of food innovation acceptance.

Practical implications

The results of the current study provide various implications for cultured meat producers, marketers, representatives of the tourism and hospitality sector, and policymakers. Primarily, addressing concerns related to quality, health, safety, and economic factors is crucial for mitigating neophobia towards cultured meat. Investments in enhancing the sensory quality can help meet consumer expectations and reduce neophobic reactions. Additionally, sharing certifications for production and storage standards may help alleviate health and safety concerns. Transformation projects and incentives can address economic problems. Moreover, incorporating the term 'clean meat' in marketing communications may boost consumer familiarity and acceptance. Understanding cultured meat neophobia is crucial for restaurants and hotels, as it represents consumers' first point of contact with this novel food. These businesses can reduce neophobia and enhance consumer trust by organizing tasting events and sharing information about health certifications and environmental benefits. Social proof strategies, such as those involving celebrity chefs, expert opinions, and consumer reviews, may also foster acceptance, as the findings highlight the importance of subjective norms. In markets characterized by pronounced cultural and religious sensitivities, such as Türkiye, communicating processes like halal certification may help mitigate consumer concerns. Ultimately, policymakers can increase public awareness of cultured meat through targeted educational campaigns. Legal regulations addressing health, environmental impact, and consumer rights could help reduce neophobia. Actors in the marketing, tourism, and hospitality sectors can implement these recommendations to support informed consumer choices, facilitating the transition to sustainable and innovative food products.

Limitations and future research

This study has several limitations. The research employed a convenience sampling technique, and data collection was limited to a single region. This may restrict the generalizability and representativeness of the findings. Moreover, as the majority of participants were university students, the study may not fully capture the attitudes and behaviors of different age groups. The current study was conducted in a predominantly rural region outside major metropolitan areas. Considering regional differences, future research conducted in diverse geographical regions and with broader socio-demographic groups could contribute to a better understanding of the causes and impacts of cultured meat neophobia. Expanding future studies to include older consumers who are more familiar with traditional products, as well as livestock farmers, could provide more comprehensive insights. Future research may further explore why ethical concerns did not significantly influence attitudes in this cultural context.

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Author Contributions:

Idea/Concept/Design: **N.G.Ö.** Data Collection and/or Processing: **N.G.Ö.** Analysis and/or Interpretation: **N.G.Ö.**, **R.A.** Literature Review: **N.G.Ö.**, Writing the Article: **N.G.Ö.** Critical Review: **N.G.Ö., R.A.** Approval: **N.G.Ö., R.A.**

References

Ajzen, I. (1991). The Theory of planned behavior. *Organisational Behavior and Human Decision Processes*, 50(2), 179-211. https://doi.org/10.1016/0749-5978(91)90020-T

Aydemir, M. E., Okan, Y. T., & Takım, K. (2023). Does Generation Z Consume Artificial Meat? Türkiye Examination. *Manas Journal of Agriculture Veterinary and Life Sciences*, *13*(2), 177-186. https://doi.org/10.53518/mjavl.1301799

Baran, A. (2020). In vitro et'e karşı olan tutumun araştırılması: Erzurum Meslek Yüksekokulu öğrencileri örneği. *Harran Üniversitesi Veteriner Fakültesi Dergisi*, *9*(2), 98-106. https://doi.org/10.31196/huvfd.717035

Basha, M. B., & Lal, D. (2019). Indian consumers' attitudes towards purchasing organically produced foods: An empirical study. *Journal of cleaner production*, *215*, 99-111. https://doi.org/10.1016/j.jclepro.2018.12.098

Baybars, M., Ventura, K., & Weinrich, R. (2023). Can in vitro meat be a viable alternative for Turkish consumers?. *MeatScience*, *201*, 109191.https://doi.org/10.1016/j.meatsci.2023.109191

Bryant, C. J., & Barnett, J. C. (2019). What's in a name? Consumer perceptions of in vitro meat under different names. *Appetite*, *137*, 104-113. https://doi.org/10.1016/j.appet.2019.02.021

Bryant, C., & Barnett, J. (2018). Consumer acceptance of cultured meat: A systematic review. *Meat science*, *143*, 8-17. https://doi.org/10.1016/j.meatsci.2018.04.008

Bryant, C., & Dillard, C. (2019). The impact of framing on acceptance of cultured meat. *Frontiers in Nutrition*, *6*, 103. https://doi.org/10.3389/fnut.2019.00103

Bryant, C., Szejda, K., Parekh, N., Deshpande, V., & Tse, B. (2019). A survey of consumer perceptions of plant-based and clean meat in the USA, India, and China. Frontiers in Sustainable Food Systems, *3*, 432863. https://doi.org/10.3389/fsufs.2019.00011

Bryant, C., van Nek, L., & Rolland, N. C. (2020). European markets for cultured meat: A comparison of Germany and France. *Foods*, *9*(9), 1152. https://doi.org/10.3390/foods9091152

Castellani, P., Cassia, F., Vargas-Sánchez, A., & Giaretta, E. (2025). Food innovation towards a sustainable world: A study on intention to purchase lab-grown meat. *Technological Forecasting and Social Change*, *211*, 123912. https://doi.org/10.1016/j.techfore.2024.123912

Cheah, I., Shimul, A. S., Liang, J., & Phau, I. (2020). Drivers and barriers toward reducing meat consumption. *Appetite*, *149*, 104636. https://doi.org/10.1016/j.appet.2020.104636

Chen, H. S. (2022). Towards environmentally sustainable diets: consumer attitudes and purchase intentions for plant-based meat alternatives in Taiwan. *Nutrients*, *14*(18), 3853. https://doi.org/10.3390/nu14183853

Chriki, S., Ellies-Oury, M. P., & Hocquette, J. F. (2022). Is "cultured meat" a viable alternative to slaughtering animals and a good comprise between animal welfare and human expectations?. *Animal Frontiers*, *12*(1), 35-42. https://doi.org/10.1093/af/vfac002

Chriki, S., Payet, V., Pflanzer, S. B., Ellies-Oury, M. P., Liu, J., Hocquette, É., ... & Hocquette, J. F. (2021). Brazilian consumers' attitudes towards so-called "cell-based meat". *Foods*, *10*(11), 2588. https://doi.org/10.3390/foods10112588

Cohen, J. (1988). Statistical Power Analysis for the Behavioral Sciences (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum Associates, Publishers.

Dean, D., Rombach, M., Vriesekoop, F., de Koning, W., Aguiar, L. K., Anderson, M., ... & Alvarez, B. (2024). Should I really pay a premium for this? Consumer perspectives on cultured muscle, plant-based and fungal-based protein as meat alternatives. *Journal of International Food & Agribusiness Marketing*, *36*(3), 502-526. https://doi.org/10.1080/08974438.2023.2169428

Dupont, J., Harms, T., & Fiebelkorn, F. (2022). Acceptance of cultured meat in Germany—Application of an extended theory of planned behavior. *Foods*, *11*(3), 424. https://doi.org/10.3390/foods11030424

Faccio, E., & Guiotto Nai Fovino, L. (2019). Food neophobia or distrust of novelties? Exploring consumers' attitudes toward GMOs, insects and cultured meat. *Applied Sciences*, *9*(20), 4440. https://doi.org/10.3390/app9204440

Fishbein, M., & Ajzen, I. (1975). *Belief, Attitude, Intention, and Behavior: An Introduction to Theory and Research*. Reading, MA: Addison-Wesley.

Food and Agriculture Organization (FAO). (2009). *Global agriculture towards 2050*. Proceedings of the High Level Expert Forum—How to Feed the World. http://www.fao.org/fileadmin/templates/wsfs/docs/Issues_papers/HLEF2050_Global_Agriculture.pdf

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of marketing research*, *18*(1), 39-50.

Gerber, P. J., Steinfeld, H., Henderson, B., Mottet, A., Opio, C., Dijkman, J., Falcucci A. & Tempio, G. (2013). *Tackling climate change through livestock: a global assessment of emissions and mitigation opportunities* (pp. xxi+-115).

Gómez-Luciano, C. A., de Aguiar, L. K., Vriesekoop, F., & Urbano, B. (2019). Consumers' willingness to purchase three alternatives to meat proteins in the United Kingdom, Spain, Brazil and the Dominican Republic. *Food quality and preference*, *78*, 103732. https://doi.org/10.1016/j.foodqual.2019.103732

Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E. and Tatham R. L. (2019). Multivariate Data Analysis. (8th Ed). England: Pearson Prentice Hall.

Hair, J. F., Hult, G. T. M., Ringle, C. M. and Sarstedt, M. (2022). A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM), (3rd ed.) Thousand Oaks, CA: Sage.

Hamdan, M. N., Post, M. J., Ramli, M. A., & Mustafa, A. R. (2018). Cultured meat in Islamic perspective. *Journal of religion and health*, *57*, 2193-2206. https://doi.org/10.1007/s10943-017-0403-3

Henseler, J., Ringle, C.M., Sarstedt, M. (2015), A New Criterion For Assessing Discriminant Validity in Varience-Based Structural Equation Modeling, Journal of the Academy of Marketing Science, 43, 115-135. 10.1007/s11747-014-0403-8

Hoang, H. C., Chovancová, M., & Hoang, T. Q. H. (2022). The theory of planned behavior and food choice questionnaire toward organic food of millennials in Vietnam. *Global Business and Finance Review*. https://doi.org/10.17549/gbfr.2022.27.4.81

Hocquette, J. F., Chriki, S., Fournier, D., & Ellies-Oury, M. P. (2024). Will "cultured meat" transform our food system towards more sustainability?, Animal, https://doi.org/10.1016/j.animal.2024.101145

Hopkins, P. D., & Dacey, A. (2008). Vegetarian meat: Could technology save animals and satisfy meat eaters?. *Journal of Agricultural and Environmental Ethics*, *21*, 579-596. https://doi.org/10.1007/s10806-008-9110-0

Hubert, B., Rosegrant, M., Van Boekel, M. A., & Ortiz, R. (2010). The future of food: scenarios for 2050. *Crop Science*, *50*, S-33. https://doi.org/10.2135/cropsci2009.09.0530

İlter, M. S. (2019). Kırsal Kalkınmada Tarım Ve Hayvancılığın Kırsal Yoksulluğu Azaltmadaki Etkileri" Yatağan'ın Sosyo-Ekonomik Yapısı Ve Tarımsal Nitelikleri". *Sosyal Politika Çalışmaları Dergisi*, *19*(44), 629-654.

Jang, H. W., & Cho, M. (2022). What attributes of meat substitutes matter most to consumers? The role of sustainability education and the meat substitutes perceptions. *Sustainability*, *14*(9), 4866. https://doi.org/10.3390/su14094866

Kock, N. (2015). Common method bias in PLS-SEM: A full collinearity assessment approach. *International Journal of e-Collaboration (ijec)*, *11*(4), 1-10. https://doi.org/10.4018/ijec.2015100101

Kumru, M., & Demir, H. (2024). Investigation of the Acceptability of Cultured Meat in University Students. *Food and Nutrition Sciences*, *15*(2), 151-169. 10.4236/fns.2024.152009

Laestadius, L. I., & Caldwell, M. A. (2015). Is the future of meat palatable? Perceptions of in vitro meat as evidenced by online news comments. *Public health nutrition*, *18*(13), 2457-2467. https://doi.org/10.1017/S1368980015000622

Larson, N., & Story, M. (2009). A review of environmental influences on food choices. *Annals of Behavioral Medicine*, *38*(suppl_1), 56-73. https://doi.org/10.1007/s12160-009-9120-9

Lynch, J., & Pierrehumbert, R. (2019). Climate impacts of cultured meat and beef cattle. *Frontiers in sustainable food systems*, *3*, 421491. https://doi.org/10.3389/fsufs.2019.00005

Maichum, K., Parichatnon, S., & Peng, K. C. (2016). Application of the extended theory of planned behavior model to investigate purchase intention of green products among Thai consumers. *Sustainability*, *8*(10), 1077. https://doi.org/10.3390/su8101077

Mancini, M. C., & Antonioli, F. (2019). Exploring consumers' attitude towards cultured meat in Italy. *Meat science*, *150*, 101-110. https://doi.org/10.1016/j.meatsci.2018.12.014

Mancini, M. C., & Antonioli, F. (2020). To what extent are consumers' perception and acceptance of alternative meat production systems affected by information? The case of cultured meat. *Animals*, *10*(4), 656. https://doi.org/10.3390/ani10040656

Mancini, M. C., & Antonioli, F. (2022). The future of cultured meat between sustainability expectations and socio-economic challenges. In *Future foods* (331-350). Academic Press. https://doi.org/10.1016/B978-0-323-91001-9.00024-4

Marcus, N., Klink-Lehmann, J., & Hartmann, M. (2022). Exploring factors determining German consumers' intention to eat meat alternatives. *Food Quality and Preference*, *100*, 104610. https://doi.org/10.1016/j.foodqual.2022.104610

Marshall, D., Bano, F., & Banas, K. (2022). A meaty issue: The effect of meat-related label terminology on the willingness to eat vegetarian foods. *Food quality and preference*, *96*, 104413. https://doi.org/10.1016/j.foodqual.2021.104413

Mattick, C., & Allenby, B. (2013). The future of meat. *Issues in Science and Technology*, *30*(1), 64-70.

Morais-da-Silva, R. L., Reis, G. G., Sanctorum, H., & Molento, C. F. M. (2022). The social impacts of a transition from conventional to cultivated and plant-based meats: evidence from Brazil. *Food Policy*, *111*, 102337. https://doi.org/10.1016/j.foodpol.2022.102337

Motoki, K., Park, J., Spence, C., & Velasco, C. (2022). Contextual acceptance of novel and unfamiliar foods: Insects, cultured meat, plant-based meat alternatives, and 3D printed foods. *Food Quality and Preference*, *96*, 104368. https://doi.org/10.1016/j.foodqual.2021.104368

Newton, P., & Blaustein-Rejto, D. (2021). Social and economic opportunities and challenges of plant-based and cultured meat for rural producers in the US. *Frontiers in Sustainable Food Systems*, *5*, 624270. https://doi.org/10.3389/fsufs.2021.624270

Nişancı, Z. (2023). Sayılarla Türkiye'de inanç ve dindarlık. *İstanbul: International Institute of Islamic Thought & Mahya Yayıncılık*.

OECD/FAO (2023). OECD-FAO Agricultural Outlook 2023-2032, OECD Publishing, Paris, https://doi.org/10.1787/08801ab7-en

Petetin, L. (2014). Frankenburgers, risks and approval. *European Journal of Risk Regulation*, *5*(2), 168-186. https://doi.org/10.1017/S1867299X00003585

Piqueras-Fiszman, B., & Spence, C. (2015). Sensory expectations based on product-extrinsic food cues: An interdisciplinary review of the empirical evidence and theoretical accounts. *Food Quality and Preference*, *40*, 165-179. https://doi.org/10.1016/j.foodqual.2014.09.013

Pliner, P., & Hobden, K. (1992). Development of a scale to measure the trait of food neophobia in humans. *Appetite*, *19*(2), 105-120. https://doi.org/10.1016/0195-6663(92)90014-W

Post, M. J., Levenberg, S., Kaplan, D. L., Genovese, N., Fu, J., Bryant, C. J., ... & Moutsatsou, P. (2020). Scientific, sustainability and regulatory challenges of cultured meat. *Nature Food*, *1*(7), 403-415. https://doi.org/10.1038/s43016-020-0112-z

Ringle, C. M., Wende, S. and Becker, J-M. (2022). SmartPLS 4. Boenningstedt: SmartPLS. https://www.smartpls.com (accessed October 29, 2024).

Risner, D., Negulescu, P., Kim, Y., Nguyen, C., Siegel, J. B., & Spang, E. S. (2024). Environmental impacts of cultured meat: A cradle-to-gate life cycle assessment. *ACS food science & technology*, *5*(1), 61-74. https://pubs.acs.org/doi/10.1021/acsfoodscitech.4c00281

Saied, A. A., Chandran, D., Chopra, H., Dey, A., Emran, T. B., & Dhama, K. (2023). Cultivated meat could aid in reducing global antimicrobial resistance burden–producing meat without antibiotics as a safer food system for the future. *International Journal of Surgery*, *109*(2), 189-190. 10.1097/JS9.0000000000000199

Sarstedt, M., Ringle, C.M., Hair, J.F. (2017), *Partial Least Squares Structural Equation Modeling*. In: Homburg, C., Klarmann, M., Vomberg A. (Eds.), Handbook of Market Research. Springer, Cham. https://doi.org/10.1007/978-3-319-05542-8_15-1

Shen, Y. C., & Chen, H. S. (2020). Exploring consumers' purchase intention of an innovation of the agri-food industry: A case of artificial meat. *Foods*, *9*(6), 745.https://doi.org/10.3390/foods9060745

Siegrist, M., & Hartmann, C. (2020). Perceived naturalness, disgust, trust and food neophobia as predictors of cultured meat acceptance in ten countries. *Appetite*, *155*, 104814. https://doi.org/10.1016/j.appet.2020.104814

Siegrist, M., & Sütterlin, B. (2017). Importance of perceived naturalness for acceptance of food additives and cultured meat. *Appetite*, *113*, 320-326. 10.1016/j.appet.2017.03.019

Szejda, K., Bryant, C. J., & Urbanovich, T. (2021). US and UK consumer adoption of cultivated meat: a segmentation study. *Foods*, *10*(5), 1050. https://doi.org/10.3390/foods10051050

Tang, K. L., Caffrey, N. P., Nóbrega, D. B., Cork, S. C., Ronksley, P. E., Barkema, H. W., ... & Ghali, W. A. (2017). Restricting the use of antibiotics in food-producing animals and its associations with antibiotic resistance in food-producing animals and human beings: a systematic review and meta-analysis. *The Lancet Planetary Health*, *1*(8), e316-e327. 10.1016/S2542-5196(17)30141-9

Thangavelu, K. P., Hyland, J. J., Henchion, M., Kerry, J. P., & Álvarez, C. (2022). Consumer intention towards the phosphate-reduced processed meat products using the extended theory of planned behavior. *Meat Science*, *193*, 108947. https://doi.org/10.1016/j.meatsci.2022.108947

Trafimow, D. (2009). The theory of reasoned action: A case study of falsification in psychology. *Theory & Psychology*, *19*(4), 501-518. https://doi.org/10.1177/0959354309336319

Tsvakirai, C. Z., Nalley, L. L., & Makgopa, T. (2023). Development and validation of a cultured meat neophobia scale: Industry implications for South Africa. *Scientific African*, *20*, e01641. https://doi.org/10.1016/j.sciaf.2023.e01641

Tubb, C., & Seba, T. (2021). Rethinking food and agriculture 2020-2030: the second domestication of plants and animals, the disruption of the cow, and the collapse of industrial livestock farming. *Industrial Biotechnology*, *17*(2), 57-72. https://doi.org/10.1089/ind.2021.29240.ctu

Tucker, C. A. (2014). The significance of sensory appeal for reduced meat consumption. *Appetite*, *81*, 168-179. https://doi.org/10.1016/j.appet.2014.06.022

Tuomisto, H. L., & Teixeira de Mattos, M. J. (2011). Environmental impacts of cultured meat production. *Environmental science & technology*, *45*(14), 6117-6123. 10.1021/es200130u

Turkish Statistical Institute (TURKSTAT). (2023). Gelir ve Yasam Kosulları Arastırması, 2023 (Income and Living Conditions Survey, 2023). https://data.tuik.gov.tr/Kategori/GetKategori?p=Gelir,-Yasam,-Tuketim-ve-Yoksulluk-107 (Accessed October 29, 2024).

United Nations, Department of Economic and Social Affairs, Population Division. (2019). *World population prospects 2019: Highlights*. https://population.un.org (accessed October 29, 2024).

Verbeke, W. A., & Viaene, J. (2000). Ethical challenges for livestock production: Meeting consumer concerns about meat safety and animal welfare. *Journal of Agricultural and Environmental Ethics*, *12*, 141-151. https://doi.org/10.1023/A:1009538613588

Verbeke, W., Marcu, A., Rutsaert, P., Gaspar, R., Seibt, B., Fletcher, D., & Barnett, J. (2015). 'Would you eat cultured meat?': Consumers' reactions and attitude formation in Belgium, Portugal and the United Kingdom. *Meat science*, *102*, 49-58. https://doi.org/10.1016/j.meatsci.2014.11.013

Wang, O., & Scrimgeour, F. (2023). Consumer segmentation and motives for choice of cultured meat in two Chinese cities: Shanghai and Chengdu. *British Food Journal*, *125*(2), 396-414. https://doi.org/10.1108/BFJ-09-2021-0987

Weinrich, R., Strack, M., & Neugebauer, F. (2020). Consumer acceptance of cultured meat in Germany. *Meat science*, *162*, 107924. https://doi.org/10.1016/j.meatsci.2019.107924

Wilks, M., & Phillips, C. J. (2017). Attitudes to in vitro meat: A survey of potential consumers in the United States. *PloS one*, *12*(2), e0171904. 10.1371/journal.pone.0171904

Wilks, M., Phillips, C. J., Fielding, K., & Hornsey, M. J. (2019). Testing potential psychological predictors of attitudes towards cultured meat. Appetite, *136*, 137-145. 10.1016/j.appet.2019.01.027

Yıldız, E. (2021). SmartPLS ile Yapısal Eşitlik Modellemesi Reflektif ve Formatif Yapılar (2nd ed.) Ankara: Seçkin Yayıncılık.