Rudienė, E., Skrickaitė, G., & Jašinskaitė, P. (2025). Rethinking protein futures: A conceptual framework for consumer attitude, subjective norms, sustainable eating psychology and culture. *Transformations and Sustainability, 1*(3), 194-211.
https://doi.org/10.63775/bff5hb72

Rethinking protein futures: A conceptual framework for consumer attitude, subjective norms, sustainable eating psychology and culture

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Abstract

This conceptual study proposes an integrated framework linking consumer attitude, subjective norms, and sustainable eating psychology to explain acceptance of alternative proteins. Building on the Theory of Planned Behavior, it highlights how cognitive, emotional, and cultural factors jointly shape sustainable food choices. The model argues that social influence, moral identity, and environmental values interact to determine consumers' openness toward novel protein sources. By synthesizing insights from sustainability, psychology, and food behavior research, the framework extends understanding beyond traditional behavioral prediction models. The study contributes theoretically by offering a holistic lens for future empirical research and practical strategies to promote sustainable protein adoption.

Keywords: alternative proteins, sustainable eating, consumer attitude, food psychology.

1. Introduction

The contemporary global food system is facing growing pressure from environmental degradation, population growth, and the need for more sustainable sources of protein. Alternative proteins, such as plant-based, fermentation-derived, and cultured meat, are often presented as promising and necessary solutions to these challenges (Menozzi et al., 2017; Heijnk et al., 2023). However, despite their potential benefits, consumer acceptance remains limited and inconsistent across markets. Much of the existing research relies on behavioral prediction models such as the Theory of Planned Behavior (TPB) and the Technology Acceptance Model (TAM), which explain intention but often overlook the deeper psychological and cultural factors that shape sustainable food choices (Amoneit, 2025; Akinmeye, 2024).

This conceptual paper seeks to address that gap by developing an integrated framework that connects consumer attitudes, subjective norms, and sustainable eating psychology to explain acceptance of alternative proteins. We argue that attitudes toward alternative proteins are not formed purely on rational evaluations of health or environmental benefits but are deeply influenced by emotions, moral beliefs, and personal identity. Subjective norms – both descriptive and injunctive - play a crucial role by reflecting the social approval and cultural meanings attached to food

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Received 26 October 2025; **Accepted** 25 November 2025; **Published** 26 November 2025

consumption (Can et al., 2024). Sustainable eating psychology provides a broader context linking values, moral identity, and long-term thinking about environmental well-being.

By synthesizing these perspectives, the proposed framework moves beyond linear behavioural models and captures the complex social and psychological dimensions of sustainable eating. It also offers a foundation for future empirical research on cross-cultural differences in sustainable protein adoption, with practical implications for communication strategies, product design, and public policy. Ultimately, this model encourages a more holistic understanding of how consumers perceive and internalize sustainability in the emerging protein economy.

2. Literature review

2.1 Alternative-proteins and cultures

Cross-cultural acceptance of alternative proteins differs significantly due to the cultural meanings attached to meat. In many societies, meat symbolizes status, tradition, masculinity, and hospitality, making plant-based, cultured, or insect proteins seem like threats to cultural identity (Rosenfeld & Tomiyama, 2021; Ruby et al., 2022). In regions where meat is central to identity, consumers show stronger "meat attachment" and disgust toward substitutes (Graça, 2022; Onwezen et al., 2021). Conversely, societies with flexitarian norms, like parts of Northern Europe, display higher openness (Hoek et al., 2021; Szejda et al., 2023).

Asia is emerging as a leading region for alternative proteins—including plant-based, fermentation-derived, and cultivated types—driven by growing protein demand, urbanization, and a health-conscious middle class. Acceptance increases when alternatives are marketed around taste, safety, and familiarity within traditional cuisines (Bryant, Szejda, Parekh, Deshpande, & Tse, 2019; FAO, 2013). Singapore's 2020 approval of cultivated meat accelerated regional innovation and investment (Choudhury, Tseng, & Swartz, 2020). Long-term success depends on cost efficiency, sensory quality, and transparent regulation (Ong, Choudhury, & Naing, 2020). Studies show that Chinese and Indian consumers express higher willingness to try cultivated meat than Western counterparts when framed as safe, affordable, and sustainable (Bryant et al., 2019). Drivers include technological optimism and trust in innovation, while barriers involve price and naturalness concerns (Ong et al., 2020).

Plant-based and fermentation-derived proteins are expanding across Asia, benefiting from compatibility with local cooking styles and ingredients (Siegrist & Hartmann, 2019). Trust in institutions and credible endorsements are crucial for acceptance (Bryant et al., 2019; Choudhury et al., 2020). Effective communication emphasizes safety, taste, and convenience rather than moral persuasion (Ong et al., 2020; Siegrist & Hartmann, 2019).

In contrast, European consumers show lower acceptance of novel proteins, especially cultured meat, insects, and mycoprotein. In Germany, only half of

respondents were willing to buy a cultured meat burger, with perceived unnaturalness and neophobia as main barriers (Dupont, Harms, & Fiebelkorn, 2022). French consumers display even lower openness (Bryant, van Nek, & Rolland, 2020). Although moral and environmental motives drive interest (Verbeke et al., 2021; Siddiqui et al., 2022), concerns about authenticity and safety remain stronger deterrents. Surveys show moderate readiness in Belgium and Germany (Bryant & Sanctorum, 2021; Mancini & Mayr, 2022), while China and Singapore report much higher acceptance levels (Bryant et al., 2019). In Europe, hesitancy is reinforced by distrust in producers and regulators (Onwezen et al., 2021). Younger and flexitarian consumers in Northern and Western Europe are more open, while older and traditional consumers, especially in Southern Europe, are more resistant (Lazou et al., 2024; Siddiqui et al., 2022). Overall, despite ethical awareness, European adoption lags behind Asia due to enduring cultural values emphasizing naturalness, familiarity, and tradition.

2.2 Subjective norms and social proof

Beyond personal attitudes, subjective norms refer to the perceived expectations and behaviors of others. These norms play an important role in shaping consumer openness to alternative proteins. Social approval and collective eating habits often influence whether people feel comfortable trying unfamiliar foods, especially in cultures where social harmony and belonging are important (Siegrist & Hartmann, 2020; Dupont et al., 2022). People are more likely to try plant-based or cultured meat when they see friends, family members, or public figures doing the same. This reflects the effect of social proof (Mancini & Antonioli, 2022). In Europe, this effect is still weak because alternative proteins are seen as niche products that are not part of daily eating routines. Studiesfrom Belgium and Germany show that limited exposure to others consuming these foods prevents them from becoming part of normal food culture (Bryant & Sanctorum, 2021; Mancini & Mayr, 2022). Subjective norms also work together with moral values and self-identity. When people believe that eating alternative proteins is both socially accepted and consistent with their ethical beliefs, they are more likely to adopt such foods (Verbeke et al., 2021; Onwezen et al., 2021). Communication strategies can strengthen these effects by using social media influencers, peer examples, or public tasting events that make sustainable foods more visible and desirable (Camilleri et al., 2021; De Groeve et al., 2023). Influencer endorsement and visible online advocacy increase perceived popularity and reduce psychological distance from novel foods, which can normalize alternative protein consumption (Camilleri et al., 2021; De Groeve et al., 2023). Cross-cultural studies show that in collectivist societies, such as many in Asia, social endorsement has a strong positive effect. In contrast, in more individualistic regions like Europe, appeals to authenticity and personal responsibility tend to work better (Khan et al., 2021; Dempsey et al., 2023). Therefore, communication about alternative proteins should match local cultural values and social structures to make these foods more socially acceptable and familiar.

2.3 Food neophobia and perceived risk

Another major factor explaining differences in sustainable protein acceptance across cultures is food neophobia—the reluctance to try unfamiliar foods—and its close companion, perceived risk. These two psychological concepts are inextricably linked, forming a cognitive-emotional hurdle that dictates initial engagement with novel foods. Consumers who perceive alternative proteins as unnatural, unsafe, or "unnerving" often express higher levels of neophobia, which directly lowers willingness to taste or purchase such products (Fernández-Celemín et al., 2022; Lupton & Turner, 2023). In fact, empirical data consistently positions food neophobia as a consistent and strong negative predictor of consumer acceptance across novel protein types, including plant-based, cultured meat, and insects (Pronk et al., 2025). This resistance is further compounded by high levels of meat commitment and a generalized meat alternative rejection tendency, a combination of factors, which serve as robust negative predictors for the consumption of various meat alternative products (Pronk et al., 2025). Research has found that these reactions are not uniform globally: cultures with more open or adventurous culinary traditions, such as parts of Southeast Asia or Latin America, tend to display lower neophobia and higher tolerance for novel food experiences (Bryant et al., 2021). This global divergence underscores the profound influence of early exposure and cultural conditioning. In contrast, Western European and North American cos, despite strong environmental awareness, often exhibit ambivalence or risk aversion toward lab-grown or insect-based proteins due to associations with artificiality or contamination (Tan et al., 2022; Shaw & Ives, 2023). For insect-based proteins specifically, this psychological resistance is formalized as the disgust factor, a deep-seated emotional rejection that creates a profound "yuck factor." This emotional barrier is often the single biggest obstacle to acceptance in Western cultures and consistently overrides consumers' recognized knowledge of the environmental benefits of entomophagy (Crummett et al., 2025). Consequently, cultural familiarity and exposure therefore play a central role in shaping perceived safety and acceptance. Reducing these psychological barriers requires not only transparent communication about production and safety but also the gradual normalization of new protein products within traditional food contexts and existing culinary frameworks (Verbeke et al., 2021).

2.4 Religious and ethical aspects

Religious and ethical frameworks also play a decisive role in shaping how cultures interpret and accept sustainable proteins. These deeply held belief systems operate as powerful cultural gatekeepers, where dietary laws and moral belief systems often determine which protein sources are considered acceptable, pure, or taboo. For instance, in predominantly Muslim or Jewish contexts, questions around halal and kosher certification strongly influence perceptions of cultured and plant-based meats (Bryant et al., 2020; Mancini & Antonioli, 2022). Similarly, in Hindu-majority regions, plant-based proteins align more closely with established vegetarian traditions, while

insect or lab-grown options may conflict with notions of spiritual purity (Vainio et al., 2022). Ethical concerns also extend beyond religion—many consumers in secular societies evaluate alternative proteins through a lens of moral consistency and animal welfare, supporting options that reduce harm but rejecting those perceived as overly technological or "unnatural" (Kwon & Lee, 2023; Onwezen et al., 2021). It's critical to note that for these consumers, the rejection of "unnaturalness" is a profound and often more fundamental affective barrier than perceived safety or ethical problems (Bryant & Barnett, 2020). This objection is frequently driven by disgust and fear rather than analytic reasoning, suggesting that information-based or cognitive strategies alone are often insufficient to overcome this deep-seated moral intuition (Wilks et al., 2021; Bryant & Barnett, 2020). This moral ambivalence—balancing compassion with purity concerns—helps explain why sustainability-oriented consumers may still hesitate to embrace cultured or insect-based products. Importantly, cross-cultural research suggests that acceptance rises when sustainable proteins are framed as compatible with existing moral frameworks rather than disruptive to them, such as through religious certification or appeals to compassion and stewardship values that resonate deeply with established ethics (Dempsey et al., 2023; Siegrist & Hartmann, 2020).

2.5 Moral norms, environmental concern, and identity in sustainable protein choice

Moral norms, environmental concern, and personal identity form the deeper psychological layer that drives or resists sustainable protein adoption across cultures. Moral norms refer to an individual's internalized sense of moralobligation to act in environmentally or ethically responsible ways, often influencing behavior even when social or economic incentives are absent (Harvey & Taheri, 2021). Consumers who view food choices as moral actions—linked to care for animals, planetary health, or fairness—tend to show stronger support for plant-based and cultured proteins (Reipurth et al., 2019). However, cultural variation in how morality is defined complicates this relationship: in some societies, moral food choice is tied to purity, naturalness, and tradition rather than environmental ethics (Rozin et al., 2021). This divergence helps explain why moral appeals to climate or animal welfare resonate powerfully in Northern Europe but far less in regions where food morality is associated with heritage and respect for ancestral diets (Dempsey et al., 2023).

Closely related is environmental concern, which often predicts openness to sustainable protein innovation but operates through differing psychological pathways. For instance, studies show that environmental concern enhances willingness to adopt plant-based proteins when combined with perceived efficacy—belief that one's choices make a difference (Apostolidis & McLeay, 2021; Siegrist & Hartmann, 2020). In collectivist cultures, this concern often takes a communal form—emphasizing collective well-being and interdependence—whereas in individualistic societies, it aligns with self-identity and moral self-consistency (Ditlevsen et al., 2023). Finally, identity serves as a binding mechanism that links

values to behavior: consumers who see themselves as "sustainable eaters" or "ethical consumers" integrate alternative proteins into their self-concept, reinforcing behavioral consistency over time (Miao et al., 2023). Yet, in contexts where meat remains a symbol of status or masculinity, sustainable diets may threaten identity coherence and provoke resistance (Ruby et al., 2022). Thus, sustainable protein acceptance depends not only on information and availability but on the degree to which these products align with cultural and moral identities.

2.6 Cognitive dissonance and the value–behavior gap

Even when consumers express strong pro-environmental or ethical values, actual behavior often fails to align—a phenomenon widely described as the value–behavior gap or cognitive dissonance in sustainable consumption. This gap is particularly pronounced in food choices, where ingrained habits, emotional comfort, and taste expectations often override sustainability ideals (Carrington et al., 2014; Vermeir & Verbeke, 2006). Cognitive dissonance theory explains that when individuals experience a mismatch between their moral beliefs ("I care about the planet") and actions ("I still eat meat"), they tend to resolve the tension by rationalizing rather than changing behavior (Festinger, 1957; Stoll-Kleemann & Schmidt, 2017). For example, many consumers downplay the environmental impact of meat or overestimate the sustainability of "local" or "organic" animal products to preserve a positive self-image (Graça et al., 2019).

However, the intensity and resolution of cognitive dissonance vary culturally. In individualistic societies, dissonance tends to be managed at the personal level—through justification or selective attention—whereas in collectivist settings, alignment with social and family eating norms often dominates, making it harder to deviate from traditional meat consumption (de Boer et al., 2021). Moreover, emotional and sensory attachment to meat remains a persistent driver of inconsistency: even consumers with high environmental awareness often describe meat as "irreplaceable" for pleasure, nutrition, or identity (Piazza et al., 2015). Studies also show that when sustainable alternatives—like plant-based or cultured proteins—fail to match the sensory expectations of conventional meat, the psychological discomfort of change increases, deepening resistance (Rosenfeld, 2018). Thus, cognitive dissonance in protein transition is not merely informational but affective and cultural, rooted in the emotional, symbolic, and sensory dimensions of eating.

Bridging this gap requires strategies that reduce dissonance without moralizing consumers. Framing alternative proteins as *additions* rather than *replacements*, emphasizing taste and enjoyment alongside ethics, and leveraging social identity cues have been found to ease the transition (Apostolidis & McLeay, 2021; Hoek et al., 2021). By addressing the psychological discomfort underlying sustainable food choices, interventions can move beyond awareness campaigns toward meaningful, lasting behavior change.

3. Conceptual framework: integrating psychological and cultural drivers of sustainable protein acceptance

3.1 Theoretical Contribution and Positioning of the Proposed Framework

The proposed framework offers a theoretically integrated model for understanding sustainable protein acceptance by combining the Theory of Planned Behavior (TPB) (Ajzen, 1991), Moral Norm Theory (Harvey & Taheri, 2021), and Cognitive Dissonance Theory (Festinger, 1957) within a cross-cultural and identity-based perspective. While each of these theories has been individually applied to sustainable consumption, their interaction has rarely been conceptualized as a dynamic system that links cognition, morality, and culture in shaping consumer behavior toward alternative proteins. This integration addresses the limitations of previous models that treat moral and cultural factors as simple extensions rather than as interdependent mechanisms influencing intention and behavior.

Existing extended TPB models have successfully incorporated moral norms or identity as additional predictors of behavioral intention (Armitage & Conner, 2001; Dean et al., 2008). However, these models often maintain a linear, additive structure, assuming that each variable independently contributes to intention. In contrast, the present framework conceptualizes moral norms, identity, and cognitive dissonance as interactive psychological forces that jointly mediate and moderate the traditional TPB pathways. Specifically, moral norms are posited to activate a sense of ethical obligation, which becomes internalized through personal identity (Miao et al., 2023), while cognitive dissonance functions as a regulatory mechanism that either reinforces or weakens attitude–behavior consistency (Graça et al., 2019). This nonlinear structure extends the TPB by acknowledging that sustainable eating is not purely rational but also emotionally and morally negotiated (Rosenfeld, 2018).

Moreover, this framework advances cross-cultural consumer psychology by explicitly incorporating cultural dimensions—such as individualism–collectivism and uncertainty avoidance—as moderators of key relationships (Hofstede, 2001; Ditlevsen et al., 2023). Prior research demonstrates that subjective norms and moral salience vary significantly across cultures (Khan et al., 2021; Ruby et al., 2022), yet few behavioral models account for how cultural orientation influences the translation of moral concern into behavioral intention. By embedding culture as a contextual moderator, this framework provides a more ecologically valid understanding of sustainable behavior across global markets.

The framework's theoretical novelty thus lies in its multi-layered integration of cognitive (attitude, perceived control), moral (norms, dissonance), identity-based, and cultural mechanisms. It moves beyond descriptive summaries of psychological correlates and proposes a dynamic model of how sustainable food behaviors emerge through interactions between individual values, social expectations, and cultural worldviews. In doing so, it extends sustainability and consumer psychology research by offering a testable, theory-driven structure capable of guiding both empirical validation and managerial application.

3.2 Conceptual Propositions and Hypotheses

Based on the integration of the Theory of Planned Behavior (TPB), Moral Norm Theory, and Cognitive Dissonance Theory within a cross-cultural context, this section presents the core propositions of the conceptual framework. The model posits that sustainable protein acceptance results from the dynamic interplay among cognitive, moral, and cultural mechanisms. Specifically, it suggests that attitudes, subjective norms,—core component of TPB—interact with moral norms, identity, environmental concern, and cognitive dissonance to shape behavioral intentions toward alternative proteins. Cultural orientation moderates several of these pathways, highlighting the context-dependent nature of sustainable food choices.

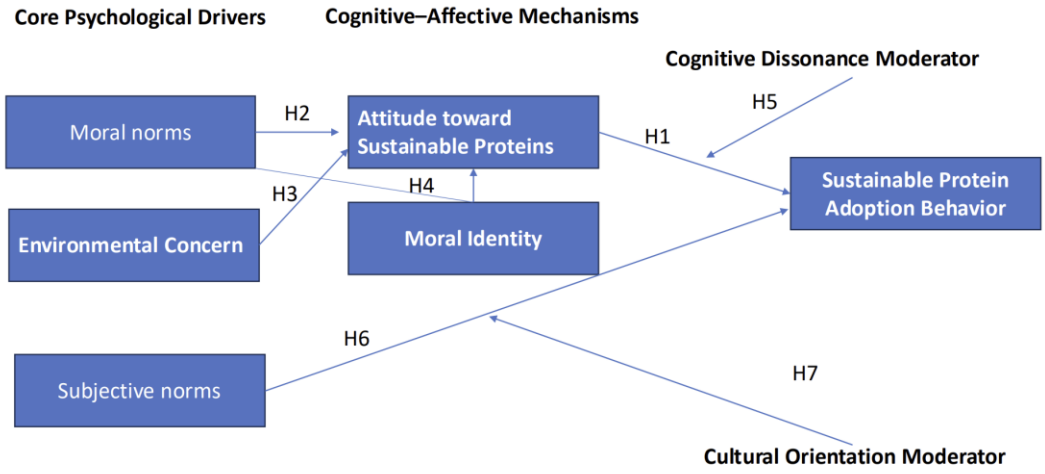

Fig. 1. Theorethical model.
Source: designed by the authors.

3.3 Attitude Formation and Behavioral Intention

According to TPB, consumer attitudes toward a behavior significantly predict behavioral intentions (Ajzen, 1991). In the context of sustainable proteins, a favorable evaluation of plant-based or cultured alternatives should lead to stronger purchase intentions. Prior studies confirm that positive attitudes toward ethical and sustainable food predict consumption intentions (Apostolidis & McLeay, 2021). Therefore:

H1: Positive attitudes toward alternative proteins are positively associated with behavioral intentions to adopt sustainable protein options.

3.4 Moral Norms and Environmental Concern

Moral norms and environmental concern are conceptualized as internalized motivations that drive pro-environmental behavior beyond social pressure (Harvey &

Taheri, 2021; Dean et al., 2008). Individuals who perceive sustainable eating as a moral duty or as a means to reduce environmental harm are more likely to form favorable attitudes toward alternative proteins (Reipurth et al., 2019). Thus:
H2: Moral norms positively influence attitudes toward alternative proteins.
H3: Environmental concern positively influences attitudes toward alternative proteins.

Furthermore, these two constructs are expected to reinforce each other, as moral obligation often stems from heightened awareness of environmental issues (Siegrist & Hartmann, 2020). This suggests a synergistic effect in shaping consumer beliefs and attitudes.

3.5 Identity as a Mediating Mechanism

Identity is proposed as a mediator between moral norms and attitudes. When individuals internalize sustainability as part of their moral self-concept ("I am an environmentally responsible person"), their ethical obligations translate into stable behavioral preferences (Miao et al., 2023). This mechanism explains how moral awareness becomes embedded in personal identity and subsequently expressed in consumption choices. Therefore:
H4: Consumer moral identity mediates the relationship between moral norms and attitudes toward alternative proteins.

3.6 Cognitive Dissonance as a Moderating Mechanism

Even when consumers hold positive attitudes or moral intentions, cognitive dissonance can weaken attitude–behavior consistency (Festinger, 1957; Graça et al., 2019). Dissonance arises when the adoption of alternative proteins conflicts with cultural norms, habits, or sensory expectations (Piazza et al., 2015). This discomfort may lead to rationalization or avoidance, rather than behavioral change. Therefore:
H5: Cognitive dissonance negatively moderates the relationship between attitudes and behavioral intentions toward alternative proteins.
This proposition recognizes that sustainable choices are often constrained by emotional and cultural barriers that undermine rational decision-making.

3.7 Subjective Norms and Cultural Moderation

Subjective norms represent perceived social expectations and approval from relevant others (Ajzen, 1991). Their influence varies across cultural contexts—particularly between collectivist and individualist societies (Khan et al., 2021; Ditlevsen et al., 2023). In collectivist cultures, where interdependence and conformity are emphasized, social endorsement can strongly predict behavior. Conversely, in individualistic cultures, personal values and self-identity may outweigh external pressures. Therefore:
H6: Subjective norms positively influence behavioral intentions toward alternative proteins.

H7: Cultural orientation moderates the relationship between subjective norms and behavioral intentions, such that the effect is stronger in collectivist cultures than in individualistic cultures.

3.8 Integrative Proposition

Synthesizing these relationships, the framework proposes that consumer acceptance of alternative proteins emerges from the interaction between rational evaluations (attitudes and perceived control), moral drivers (moral norms and environmental concern), identity formation, emotional regulation (cognitive dissonance), and cultural context. The model emphasizes that sustainable eating is not a linear outcome of knowledge or awareness but a multidimensional process shaped by the alignment—or misalignment—between moral self-concept, social influence, and cultural meaning.

This framework can guide empirical testing across diverse markets and provides a foundation for developing culturally adaptive communication and marketing strategies that promote sustainable dietary transitions. Annex A provides a list of recommendations relevant to the theoretical constructs developed in the study.

4. Concluding remarks

This conceptual paper has sought to advance understanding of the psychological and cultural mechanisms that shape the acceptance of alternative proteins in the context of global sustainability transitions. Building on the Theory of Planned Behavior, Moral Norm Theory, and Cognitive Dissonance Theory, the proposed framework integrates moral, cognitive, and cultural dimensions to explain how individuals form attitudes, intentions, and behaviors toward sustainable protein choices. By positioning moral norms, identity, and culture as integral to the decision-making process, this study reframes sustainable eating not simply as a behavioral outcome of information and awareness, but as an expression of moral values, social influence, and self-concept.

The model highlights that sustainable protein adoption is influenced by a network of interdependent factors—rational beliefs, moral motivations, cultural norms, and emotional consistency. It also suggests that cognitive dissonance and cultural orientation serve as critical moderators, determining whether sustainable choices align with personal and societal expectations. By incorporating these mechanisms, the framework provides a more comprehensive lens through which researchers and practitioners can interpret consumer behavior in emerging food systems.

From a theoretical perspective, this study contributes to sustainability and consumer research by merging environmental psychology and marketing behavior within a unified structure. It encourages future empirical studies to test and refine these relationships across cultural contexts and to explore how moral identity and dissonance evolve as alternative proteins become mainstream. Practically, the framework underscores the need for authenticity, cultural sensitivity, and identity-based communication in promoting sustainable eating habits.

Ultimately, the transition to sustainable protein sources is not solely a technological challenge—it is a psychological and cultural one. Encouraging widespread adoption requires more than innovation; it demands empathy, trust, and alignment between moral values, social norms, and everyday food practices. By understanding these deeper motivations, both researchers and practitioners can design interventions that not only foster sustainable consumption but also contribute to a broader transformation toward ethical and resilient food systems.

The proposed framework provides actionable insights for marketers, policymakers, and organizations seeking to accelerate the acceptance of sustainable protein alternatives. Understanding the psychological and cultural mechanisms that shape consumer decision-making enables the development of strategies that resonate with both individual and collective motivations. Translating theoretical constructs—such as moral norms, subjective norms, identity, and culture—into practical interventions can make sustainability communication more effective and socially grounded.

Brands should frame their sustainability initiatives in a way that reflects authentic moral intent rather than instrumental marketing goals. When moral norms are activated, consumers perceive sustainable actions as expressions of shared ethical responsibility rather than self-promotion (Harvey & Taheri, 2021). Therefore, communication should highlight genuine commitment to social and environmental good, transparency in sourcing, and measurable impact. For instance, messages that emphasize fairness, animal welfare, or contributions to climate resilience can strengthen moral resonance. Importantly, such communication must avoid "greenwashing" or exaggerated claims, as these erode moral trust and long-term brand credibility.

The influence of subjective norms underscores the importance of social proof and community endorsement in shaping acceptance of alternative proteins. Organizations can enhance social legitimacy by engaging influencers, chefs, NGOs, and peer advocates who model sustainable consumption in culturally relevant ways (Mancini & Antonioli, 2022). Campaigns emphasizing collective participation—such as "join the movement" or "eat for change together"—can enhance perceived social approval. In collectivist cultures, visible community campaigns and social endorsements are especially effective, while in individualist contexts, highlighting personal autonomy and moral leadership may yield stronger results.

Identity-driven marketing recognizes that food choices are expressions of who consumers believe they are. Brands can position alternative proteins as integral to desirable self-concepts such as "the mindful eater," "the ethical consumer," or "the progressive innovator." When sustainable eating aligns with aspirational identities, it fosters internal consistency and emotional satisfaction (Miao et al., 2023). Effective strategies include using storytelling, brand communities, and lifestyle narratives that make sustainable eating appear not only morally right but also modern, empowering, and self-affirming.

Cultural orientation fundamentally shapes how consumers interpret sustainability messages. In collectivist cultures (e.g., many Asian or Latin American

societies), marketing should emphasize community well-being, shared responsibility, and collective progress—for example, highlighting how choosing alternative proteins supports national sustainability goals or protects future generations (Ditlevsen et al., 2023; Khan et al., 2021). In contrast, in individualist cultures, messages should focus on personal ethics, authenticity, and individual empowerment, such as making informed, conscious choices or being a "pioneer of change." Local partnerships and culturally resonant storytelling further increase message acceptance and trust.

From a managerial perspective, organizations should adopt a multilayered communication strategy that integrates moral appeals, social validation, and cultural adaptation. Product design and retail experiences should reinforce this coherence by offering transparency (e.g., clear sustainability labeling), participation opportunities (e.g., community challenges or co-creation campaigns), and sensory excellence that minimizes cognitive dissonance. By aligning moral intent, social influence, and identity expression within culturally appropriate narratives, brands can move consumers from passive awareness to active engagement with sustainable proteins.

Ultimately, the framework suggests that successful promotion of alternative proteins requires not only technological innovation but empathetic communication grounded in psychological realism. When sustainability is embedded in moral meaning, shared identity, and cultural values, consumer acceptance becomes both emotionally satisfying and socially legitimate, enabling lasting transformation toward sustainable food systems.

As a conceptual study, this paper does not provide empirical validation of the proposed framework, which represents an important next step for future research. The relationships among attitude, subjective norms, identity, and cognitive dissonance should be tested through cross-cultural comparative studies to assess how these constructs vary across societies with different food traditions and sustainability norms. Future research could apply mixed-method approaches, combining surveys, experiments, and qualitative interviews to capture both the cognitive and emotional dimensions of protein acceptance. Additionally, longitudinal designs would help track how consumer perceptions evolve as alternative proteins become more familiar and socially normalized. The model may also be extended to include technological trust, sensory experience, and media framing, which increasingly influence sustainable food choices. By empirically testing and refining these pathways, scholars can transform this conceptual framework into a practical tool for guiding interventions that promote more inclusive and culturally sensitive protein transitions.

References

Ajzen, I. (1991). *The theory of planned behavior. Organizational Behavior and Human Decision Processes, 50*(2), 179–211.

Armitage, C. J., & Conner, M. (2001). Efficacy of the theory of planned behaviour: A meta-analytic review. *British Journal of Social Psychology, 40*(4), 471–499.

Akinmeye F., Chriki S., Liu C., Zhao J., Ghnimi S. (2024) What factors influence consumer attitudes towards alternative proteins? Food Humanit, 3:100349. doi: 10.1016/j.foohum.2024.100349

Amoneit M, Gellrich L, Weckowska DM. (2025). Consumer Acceptance of Alternative Proteins: Exploring Determinants of the Consumer Willingness to Buy in Germany. Foods, 9;14(14):2427. doi: 10.3390/foods14142427. PMID: 40724248; PMCID: PMC12294508

Apostolidis, C., & McLeay, F. (2019). To meat or not to meat? Comparing empowered meat consumers' and anti-consumers' preferences for sustainability labels. Food Quality and Preference, 77, 109–122. https://doi.org/10.1016/j.foodqual.2019.05.002

Apostolidis, C., & McLeay, F. (2021). *Consumer perceptions and acceptance of plant-based alternatives: The role of environmental concern and perceived efficacy. Food Quality and Preference, 94*, 104313. https://doi.org/10.1016/j.foodqual.2021.104313

Apostolidis, C., & McLeay, F. (2021). Should we stop meating like this? Reducing meat consumption through substitution. Food Policy, 99, 101974. https://doi.org/10.1016/j.foodpol.2020.101974

Bryant, C., & Sanctorum, H. (2021). Alternative proteins, evolving attitudes: Comparing consumer attitudes to plant-based and cultured meat in Belgium in two consecutive years. Appetite, 161, 105161. https://doi.org/10.1016/j.appet.2021.105161

Bryant, C., Anderson, J. E., Asher, K. E., Green, C., & Gasteratos, K. (2020). *Strategies for communicating about cultured meat: Religious and ethical perspectives. Frontiers in Nutrition, 7*, 70. https://doi.org/10.3389/fnut.2020.00070

Bryant, C., & Barnett, J. (2020). Consumer Acceptance of Cultured Meat: An Updated Review (2018–2020). Applied Sciences, 10(15), 5201. https://doi.org/10.3390/app10155201

Bryant, C., Szejda, K., & Wise, J. (2021). *Exploring global patterns in consumer acceptance of cultured meat: Cross-cultural evidence from 27 countries. Frontiers in Sustainable Food Systems, 5*, 686325. https://doi.org/10.3389/fsufs.2021.686325

Bryant, C., Szejda, K., Parekh, N., Deshpande, V., & Tse, B. (2019). A comparative study of consumer acceptance of cultured meat in the United States, China, and India. Frontiers in Sustainable Food Systems, 3, 11. https://doi.org/10.3389/fsufs.2019.00011

Camilleri, A. R., Larrick, R. P., Hossain, S., & Patino-Echeverri, D. (2021). Consumers underestimate the emissions associated with food but are aided by labels. Nature Climate Change, 9(1), 53–58. https://doi.org/10.1038/s41558-018-0354-z

Can, B., Majoo, F., & Öztürkcan, A. (2024). Consumer Acceptance, Attitude and Knowledge Studies on Alternative Protein Sources: Insight Review. Gıda, 49(4), 682-702.

Carrington, M. J., Neville, B. A., & Whitwell, G. J. (2014). *Lost in translation: Exploring the ethical consumer intention–behavior gap. Journal of Business Research, 67*(1), 2759–2767. https://doi.org/10.1016/j.jbusres.2012.09.022

Crummett, D., Vancauwenberghe, L., et al. (2025). Beyond the buzz: Insect-based foods are unlikely to significantly reduce meat consumption. npj Sustainable Agriculture. https://doi.org/10.1038/s44264-025-00075-z

Choudhury, D., Tseng, T. W., & Swartz, E. (2020). The business of cultured meat. *Trends in Biotechnology, 38*(6), 573–577. https://doi.org/10.1016/j.tibtech.2020.02.012

de Boer, J., Schösler, H., & Aiking, H. (2021). *Cultural and social dynamics of meat reduction and substitution: The role of cognitive dissonance. Appetite, 163*, 105229. https://doi.org/10.1016/j.appet.2021.105229

de Boer, J., Schösler, H., & Aiking, H. (2021). Motives for consumers' plant-based eating: Development and validation of a measure. Food Quality and Preference, 91, 104201. https://doi.org/10.1016/j.foodqual.2021.104201

De Groeve, B., Bleys, B., & Hudders, L. (2023). The power of influencers: The impact of social media endorsements on sustainable food choices. Appetite, 181, 106361. https://doi.org/10.1016/j.appet.2022.106361

Dean, M., Raats, M. M., & Shepherd, R. (2008). Moral concerns and consumer choice of fresh and processed organic foods. *Journal of Applied Social Psychology, 38*(8), 2088–2107.

Dempsey, C., Bryant, C. J., & Barnett, J. (2023). *The role of social norms and identity in consumer acceptance of cultivated meat: Cross-cultural insights. Food Quality and Preference, 108*, 104876. https://doi.org/10.1016/j.foodqual.2023.104876

Dempsey, C., Bryant, C., & Onwezen, M. C. (2023). Cultural influences on the acceptance of alternative proteins: A cross-cultural perspective. Food Quality and Preference, 108, 104891. https://doi.org/10.1016/j.foodqual.2023.104891

Ditlevsen, K., Sandøe, P., & Lassen, J. (2023). *Cultural differences in moral motivations for sustainable eating: Comparing collectivist and individualist contexts. Appetite, 181*, 106444. https://doi.org/10.1016/j.appet.2023.106444

Dupont, J., Fiebelkorn, F., & Hartmann, C. (2022). *Social influence in sustainable food choices: How perceived social approval and descriptive norms affect plant-based eating. Appetite, 179*, 106303. https://doi.org/10.1016/j.appet.2022.106303

Dupont, J., Fiebelkorn, F., & Verneau, F. (2022). Social influences on sustainable food choices: The role of perceived norms and social identity. Sustainability, 14(7), 4327. https://doi.org/10.3390/su14074327

Dupont, J., Harms, T., & Fiebelkorn, F. (2022). Acceptance of Cultured Meat in Germany-Application of an Extended Theory of Planned Behaviour. Foods (Basel, Switzerland), 11(3), 424. https://doi.org/10.3390/foods11030424

Fernández-Celemín, L., Sijtsema, S. J., & Fischer, A. R. H. (2022). *Food neophobia and consumer perception of alternative proteins: A European perspective. Appetite, 174*, 106001. https://doi.org/10.1016/j.appet.2022.106001

Festinger, L. (1957). *A theory of cognitive dissonance.* Stanford University Press.

Food and Agriculture Organization of the United Nations. (2013). *Edible insects: Future prospects for food and feed security*. Rome: FAO.

Graça, J. (2022). *Meat, beyond the plate: Consumer attitudes toward meat alternatives and the role of identity. Appetite, 170*, 105880. https://doi.org/10.1016/j.appet.2021.105880

Graça, J., Godinho, C. A., & Truninger, M. (2019). Redefining meat: Flexitarian shifts in the cultural meaning of meat. Journal of Social Issues, 75(1), 78–95. https://doi.org/10.1111/josi.12307

Graça, J., Oliveira, A., & Calheiros, M. M. (2019). *Meat, morals, and motivations: The cognitive dissonance of sustainable meat consumption. Appetite, 141*, 104295. https://doi.org/10.1016/j.appet.2019.104295

Hanboonsong, Y., Jamjanya, T., & Durst, P. B. (2013). *Six-legged livestock: Edible insect farming, collecting and marketing in Thailand*. Bangkok: FAO Regional Office for Asia and the Pacific.

Harvey, J., & Taheri, B. (2021). *Moral obligation and sustainable food choice: Integrating moral norm theory with the Theory of Planned Behavior. Journal of Business Ethics, 173*(1), 123–138. https://doi.org/10.1007/s10551-020-04558-3

Heijnk, V., Espey, A., & Schuenemann, F. (2023). A comparison of influencing factors on attitudes towards plant-based, insect-based and cultured meat alternatives in Germany. Food Quality and Preference, 110, 104966.

Hoek, A. C., Pearson, D., James, S. W., Lawrence, M. A., & Friel, S. (2021). *Healthy and environmentally sustainable food choices: Consumer perceptions and barriers in a cross-*

cultural context. Public Health Nutrition, 24(3), 481–493. https://doi.org/10.1017/S1368980020001465

Hofstede, G. (2001). *Culture's consequences: Comparing values, behaviors, institutions and organizations across nations*. Sage Publications.

Khan, S., Lee, M., & Kim, J. (2021). *The moderating effect of collectivism on the relationship between subjective norms and green food consumption intention. Sustainability, 13*(9), 4745. https://doi.org/10.3390/su13094745

Kwon, J., & Lee, H. (2023). *Ethical consumption and the paradox of food technology: Consumer moral reasoning toward alternative proteins. Journal of Business Ethics, 189*(4), 1021–1036. https://doi.org/10.1007/s10551-022-05287-8

Lazou, A., Tsakalidou, E., & Kapsokefalou, M. (2024). Cultured meat: A survey of awareness among Greek consumers. AIMS Agriculture and Food, 9(1), 48–66. https://doi.org/10.3934/agrfood.2024021

Lupton, D., & Turner, B. (2023). *Unfamiliar foods and imagined risks: The social psychology of alternative protein rejection. Food, Culture & Society, 26*(2), 354–372. https://doi.org/10.1080/15528014.2022.2101745

Mancini, M. C., & Antonioli, F. (2022). *Exploring consumers' attitude toward cultivated meat in a cross-country context: The role of social norms and trust. Food Research International, 159*, 111633. https://doi.org/10.1016/j.foodres.2022.111633

Mancini, M. C., & Mayr, H. (2022). Acceptance of cultured meat in Germany: Application of an extended theory of planned behaviour. Foods, 11(3), 424. https://doi.org/10.3390/foods11030424

Menozzi, D., Sogari, G., Veneziani, M., Simoni, E., & Mora, C. (2017). Eating novel foods: An application of the Theory of Planned Behaviour to predict the consumption of an insect-based product. Food quality and preference, 59, 27-34.

Miao, L., Mattila, A. S., & Mount, D. (2023). *Moral identity and sustainable eating: How self-concept shapes food choice intentions. Sustainability, 15*(7), 5764. https://doi.org/10.3390/su15075764

Ong, K. J., Choudhury, D., & Naing, M. W. (2020). Cultured meat: Emerging nomenclature, consumer acceptance, and health concerns. *Food Science and Human Wellness, 9*(4), 361–372. https://doi.org/10.1016/j.fshw.2020.06.001

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

Onwezen, M. C., van der Weele, C. N., van Leeuwen, E., Sijtsema, S. J., Dagevos, H., & Jasper, J. (2021). Consumer acceptance of alternative proteins: A systematic review of determinants and interventions. Appetite, 159, 105080. https://doi.org/10.1016/j.appet.2020.105080

Piazza, J., Ruby, M. B., Loughnan, S., Luong, M., Kulik, J., Watkins, H. M., & Seigerman, M. (2015). *Rationalizing meat consumption: The 4Ns. Appetite, 91*, 114–128. https://doi.org/10.1016/j.appet.2015.04.011

Pronk, K., Etter, B., Michel, F., & Siegrist, M. (2025). Consumer acceptance of different protein sources for meat alternatives: A multinational study. Appetite, 215, 108246. https://doi.org/10.1016/j.appet.2025.108246

Reipurth, M. F. S., Hørby, L., Gregersen, C. G., Bonke, A., & Pérez-Cueto, F. J. (2019). *Meat reduction and plant-based eating: The role of moral attitudes and food choice motives. Appetite, 141*, 104313. https://doi.org/10.1016/j.appet.2019.104313

Rosenfeld, D. L. (2018). *The psychology of vegetarianism: Recent advances and future directions. Appetite, 131*, 125–138. https://doi.org/10.1016/j.appet.2018.09.011

Rosenfeld, D. L., & Tomiyama, A. J. (2021). *When ideology matters more than health: The influence of moral and identity-based motivations on meat consumption. Appetite, 164*, 105277. https://doi.org/10.1016/j.appet.2021.105277

Rozin, P., Fischler, C., Shields-Argelès, C., & Rozin, A. (2021). *Moralization and food: The cultural shaping of good and bad eating. Food, Culture & Society, 24*(5), 685–706. https://doi.org/10.1080/15528014.2020.1862038

Ruby, M. B., Heine, S. J., & Kaplan, D. M. (2022). *Meat, masculinity, and identity: Cultural resistance to plant-based diets. Appetite, 177*, 106138. https://doi.org/10.1016/j.appet.2022.106138

Shaw, E., & Ives, C. D. (2023). *Perceived naturalness and disgust as barriers to sustainable protein innovation: A cross-cultural study of Western consumers. Appetite, 182*, 106453. https://doi.org/10.1016/j.appet.2023.106453

Siddiqui, S. A., Alvi, T., Sameen, A., Khan, S., Blinov, A. V., Nagdalian, A. A., Mehdizadeh, M., Adli, D. N., & Onwezen, M. C. (2022). Consumer acceptance of alternative proteins: A systematic review of current alternative protein sources and interventions adapted to increase their acceptability. Sustainability, 14(22), 15370. https://doi.org/10.3390/su142215370

Siegrist, M., & Hartmann, C. (2020). Consumer acceptance of novel food technologies. Nature Food, 1(6), 343–350. https://doi.org/10.1038/s43016-020-0094-x

Stoll-Kleemann, S., & Schmidt, U. J. (2017). *Reducing meat consumption in developed and transition countries to counter climate change and biodiversity loss: A review of influence factors. Regional Environmental Change, 17*(5), 1261–1277. https://doi.org/10.1007/s10113-016-1057-5

Szejda, K., Urbanovich, T., & Bryant, C. (2023). *Factors shaping global consumer acceptance of plant-based and cultivated meat: A meta-analytic review. Frontiers in Sustainable Food Systems, 7*, 1110432. https://doi.org/10.3389/fsufs.2023.1110432

Tan, H. S. G., Tibboel, C. J., & Stieger, M. (2022). *Understanding disgust toward insect-based foods and cultured meat: The role of familiarity, attitudes, and cultural exposure. Food Quality and Preference, 96*, 104406. https://doi.org/10.1016/j.foodqual.2021.104406

Taufik, D., Verain, M. C. D., Bouwman, E. P., & Reinders, M. J. (2019). Determinants of real-life behavioural interventions to reduce meat consumption: A review. Appetite, 142, 104347. https://doi.org/10.1016/j.appet.2019.104347

Vainio, A., Irz, X., & Hartikainen, H. (2021). How effective are messages and their characteristics in changing meat consumption? A systematic review and meta-analysis. Appetite, 156, 104880. https://doi.org/10.1016/j.appet.2020.104880

Verbeke, W., Pérez-Cueto, F. J. A., & de Barcellos, M. D. (2021). *Communication strategies to reduce food neophobia and perceived risk in novel protein products. Trends in Food Science & Technology, 112*, 12–22. https://doi.org/10.1016/j.tifs.2021.02.009

Vermeir, I., & Verbeke, W. (2006). *Sustainable food consumption: Exploring the consumer "attitude–behavioral intention" gap. Journal of Agricultural and Environmental Ethics, 19*(2), 169–194. https://doi.org/10.1007/s10806-005-5485-3

Wilks, O. E., Hornsey, M. J., & Bloom, P. (2021). What does it mean to say that cultured meat is unnatural? Appetite, 156, 104880. https://doi.org/10.1016/j.appet.2020.104960

Appendix A. Details of practical recommendations

Table A1

Practical recommendations

Theoretical Construct	Strategic / Managerial Application	Expected Consumer Response
Moral Norms	Communicate authentic ethical values and transparency in sustainability claims; emphasize real social and environmental outcomes (e.g., CO_2 reduction, animal welfare, or community impact). Avoid "greenwashing."	Enhanced moral trust; perception of brand integrity and genuine responsibility; greater willingness to support ethical brands.
Subjective Norms	Partner with social influencers, chefs, NGOs, and community figures who embody sustainable lifestyles; run participatory campaigns (e.g., "Eat for Change Week").	Increased perception of social approval and belonging; stronger social validation for trying sustainable proteins.
Identity	Frame sustainable protein consumption as a form of self-expression (e.g., "the mindful eater," "the modern changemaker"); use lifestyle storytelling and community building around sustainability.	Strengthened alignment between self-concept and consumption; emotional satisfaction and long-term behavioral consistency.
Environmental Concern	Provide clear, evidence-based information on environmental benefits (e.g., reduced emissions, land use); use visual storytelling and comparative life-cycle data.	Greater cognitive justification for choice; reinforcement of positive environmental attitudes and moral efficacy.

Table A1 continued

Theoretical Construct	Strategic / Managerial Application	Expected Consumer Response
Cognitive Dissonance	Reduce psychological discomfort by emphasizing taste, familiarity, and sensory quality; frame alternative proteins as additions to diets, not replacements; highlight enjoyment and health.	Lower resistance and emotional discomfort; improved trial rates and repeat purchases.
Cultural Orientation (Collectivist Contexts)	Stress collective benefits—national pride, social harmony, community well-being; feature family-oriented or group-sharing imagery; use government or NGO endorsements.	Strengthened conformity to social and cultural norms; enhanced collective motivation to adopt sustainable behaviors.
Cultural Orientation (Individualist Contexts)	Emphasize autonomy, freedom of choice, and moral leadership; highlight how sustainable eating reflects personal ethics and forward-thinking values.	Increased perception of control and moral authenticity; higher engagement among independent, value-driven consumers.

Source: designed by the authors