

The impact of Sustainability Claims and Product Categorization on Attitudes and Purchase Intentions toward Hybrid Food Products: The Moderating Role of Consumer Familiarity

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Abstract

As demand for innovative protein alternatives increases, hybrid food products (HFPs), which combine animal and plant-based ingredients, have entered the market as a novel category positioned between traditional meat and fully plant-based options to address changing consumer preferences and dietary changes. Yet, despite their increasing availability, HFPs remain underexplored in consumer research, with limited understanding of how they are perceived and evaluated. This study examines how two marketing tactics, sustainability claims and product categorization, affect consumer attitudes and purchase intentions towards HFPs in the Netherlands. Additionally, the moderating role of consumer familiarity is examined. A 2x2 between-subjects experimental study, through an online survey, was conducted with 171 participants living in the Netherlands. Participants were randomly assigned to view a fictitious hybrid burger advertisement with either a sustainability claim or no claim and categorized as either beef or vegetarian.

The results reveal that neither sustainability claims nor product categorization significantly influence purchase intentions or attitudes towards HFPs. Similarly, consumer familiarity did not moderate the effect of these marketing tactics. However, consumer attitude was found to be a strong and significant predictor of purchase intention. Among control variables, price sensitivity, ethical concerns, and subjective norms showed significant influence across models. These findings suggest that commonly used marketing tactics such as sustainability claims and product categorization alone may be insufficient to promote HFP adoption. This study contributes to the marketing and consumer behaviour literature of HFPs by highlighting the need for consumer-centred communication strategies tailored to the underlying attitudes and provides actionable insights for practitioners aiming to market HFPs.

KEYWORDS: Hybrid food products, Sustainability claims, Product categorization, Consumer behaviour, Marketing tactics.

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1. Introduction

Hybrid products involve the combination of two or more existing elements into a new product with added value and functionality (Morel, 2006, pp.97-98). Because hybrid products combine features of multiple categories, they are often perceived ambiguous and difficult to classify (Morel, 2006, pp.97-98). For example, a hybrid hotdog containing both meat and vegetables may be interpreted by one consumer as a meat product, while another may see it as vegetarian. This inconsistency in product categorization, known as misclassification, can lead to confusion about the product's identity and expected attributes such as taste, health benefits or suitability for certain diets (Salgaonkar & Nolden, 2024, p.8). For marketers, this presents a challenge: when a product does not clearly fit into one category it becomes harder to position it effectively and communicate its value. For consumers, the uncertainty may increase the cognitive effort required to evaluate the product, which can lower their willingness to try or purchase it (Rajagopal & Burnkrant, 2008, p.232; Moreau et al., 2001, p.489). In contrast non-hybrid products fit more easily into familiar categories making marketing communication more straightforward (Morel, 2006, pp.97-98).

Hybrid food products (HFPs) are a specific form of hybrid products that combine meat-based and plant-based ingredients, offering a middle-ground alternative for consumers looking to reduce meat consumption without fully switching to plant-based diets (Grasso & Goksen, 2023, pp.1-7). Although HFPs have been launched in several countries in recent years, many have failed to secure a stable market position, with the exact reasons for their limited success remaining unclear (Grasso, 2024, p.8694). This raises the question: what barriers could prevent consumers from adopting HFPs? One major barrier to adoption is product ambiguity, meaning that HFPs can be difficult for consumers to categorize (Salgaonkar & Nolden, 2024, p.8). This consumer confusion may hinder the adoption of HFPs, as these products are neither since fully meat nor entirely plant based. Therefore, their ambiguous categorization makes it difficult for consumers to form clear expectations about taste, health benefits, or ethical implications (Salgaonkar & Nolden, 2024, p.8). Continuing, research suggests that consumer rely on "single category belief" which means they evaluate HFPs based on one dominant category, potentially ignoring other beneficial attributes (Rajagopal & Burnkrant, 2008, p.232). This ambiguity complicates effective product

positioning and marketing communication, which may in turn contribute to disappointing sales performance and unmet retailer expectations in a highly dynamic market environment. In addition, consumer familiarity also plays a significant role. Many people are not familiar with the concept of HFPs, making it difficult for them to understand what HFPs are, how they are prepared, and what benefits they offer (Ryder et al., 2023, p.4). This unfamiliarity increases scepticism and reduces willingness to try such products (Grasso, 2024, p. 8694). These challenges raise important questions about how HFPs can be presented in ways that reduce confusion and encourage consumer acceptance.

To support successful market placement, marketers often rely on tactics. Two prominent tactics include product categorization and sustainability claims. Product categorization refers to the way a product is labelled or framed, such as “meat” versus “vegetarian”, which can influence consumer expectations. For example, labelling HFPs as meat products may appeal more to omnivores and flexitarians, whereas categorizing them as vegetarian could potentially reduce purchase intent among these consumers, as they may associate plant-based alternatives with different sensory expectations. This leads to inconsistent expectations about taste, texture, or health value, complicating marketing communication (Moreau et al., 2001, p.489). Without strong marketing support, HFPS may struggle to attract consumers, especially if their value is not clearly communicated. While this ambiguity creates barriers to adoption, it also provides an opportunity for marketers to influence how consumers mentally categorize these products through effective labelling and communication (Moreau et al., 2001, p.489).

A second widely used tactic is the use of sustainability claims, which refers to statements about a product’s environmental or social benefits, which must be clear, truthful, and evidence-based to avoid misleading consumers (Autoriteit Consument & Markt, n.d.). Grasso (2024, p.8694) emphasizes clear sustainability messaging, convenience, consumer awareness, and environmental communication as important marketing strategies for HFPs. Supporting this, recent studies highlight that sustainability claims, when credible and transparent, can significantly increase consumer acceptance and willingness to purchase (Asioli et al., 2022, p.57; Nes et al., 2024, p.384). However, the effectiveness of these claims may vary depending on the consumers values and mindset. Consumers with restraint mindset are more responsive to sustainability cues, due to their long-term focus on health and ethics, while indulgent consumers prioritize taste and are less influenced by such claims

(Smart & Pontes, 2023, pp.1-7). Although research found that sustainability claims influence food acceptance, their effect on purchase intention and attitudes remains unclear. Similarly, while product categorization plays a role in setting expectations and positioning, it is still unknown whether labelling HFPs as meat or vegetarian affects consumer acceptance or behaviour. A potential key factor in this equation is consumer familiarity. Research suggests that unfamiliarity with HFPs can hinder clear product perception, increasing reliance on extrinsic cues (Ryder et al., 2023, p.4), such as sustainability claims and product categorization.

Given the challenges surrounding consumer acceptance of HFPs, this study examines how sustainability claims and product categorization influence purchase intentions and attitudes for HFPs in the Netherlands. Since consumer familiarity plays a key role in the adoption of HFPs (Salgaonkar & Nolden, 2024, p.9), this study also explores whether consumer familiarity moderates these effects. By testing these relationships through an experimental design, this research offers insights into how marketers can position HFPs more effectively. Therefore, the central research question is: To what extent do sustainability claims and product categorization influence the purchase intentions and consumer attitudes towards hybrid food products in the Netherlands?

1.1. Academic Relevance

This study contributes to the limited body of research on HFPs by empirically testing how categorizing these products as either meat or vegetarian influences consumer purchase intentions and attitudes. In doing so, it expands existing categorization theory, which has primarily focused on technological or multifunctional hybrids, by applying it to the food industry. The findings offer insights into whether strategic product labelling can help resolve consumer confusion and support more effective positioning of HFPs in the market.

Furthermore, while sustainability claims are frequently used in food marketing, their actual effect on purchase intention is still debated. Some studies suggest that sustainability cues, especially when backed with credible labels, can enhance acceptance and willingness to pay (Asioli et al., 2002, p.57). However, other findings indicate that health remains a more dominant motivation than sustainability (Grasso & Goksen, 2022, p.6). This mixed evidence signals a theoretical gap concerning the efficacy and limitations of sustainability claims within

HFPs marketing, which this study aims to address. One possible explanation for these inconsistent findings may lie in consumer familiarity, where individuals unfamiliar with HFPs may rely more heavily on external cues such as sustainability claims when evaluating products. By addressing these questions, the present study adds to the academic discussion on how HFPs are perceived, and which marketing tactics most effectively influence consumer decision-making.

1.2. Societal Relevance

This study is expected to offer practical insights for food producers, marketers, and policymakers aiming to promote HFPs. Although HFPs have the potential to support a gradual reduction in meat consumption, especially for people who do not want to go fully vegetarian, they are still not widely adopted. By focusing on two specific marketing tactics, sustainability claims and product categorization, this study shows how small differences in communication can influence people's attitudes and willingness to buy. It also examines whether these effects are stronger or weaker depending on how familiar consumers are with HFPs, which helps companies understand what kind of messaging works, and for whom.

By testing how these strategies influence consumer responses, this study provides actionable knowledge for companies trying to position HFPs more effectively. In particular, the findings can inform the development of communication strategies that resonate with flexitarian consumers and meat-reducing segments. Rather than assuming that general sustainability messaging is sufficient, the study highlights the importance of tailored, evidence-based positioning to reduce confusion and increase acceptance. This to ensure that HFPs can be recognized as credible and desirable alternatives to conventional meat.

Ultimately, this study contributes to the broader societal challenge of encouraging sustainable consumption, not through policy or top-down regulation, but by improving the commercial effectiveness and consumer acceptance of innovative food products.

2. Theoretical Framework

The chapter begins by defining hybrid products, highlighting their unique characteristics and challenges. This is followed by going into more depth about hybrid food products. Next, an overview of key marketing tactics and barriers are described, such as sustainability claims and product categorization. Subsequently, consumer behaviour regarding HFPs is examined through the lens of the Theory of Planned Behaviour (TPB), with a focus on attitudes and purchase intentions. Based on these insights, a set of hypotheses are formulated. The chapter concludes with a conceptual framework that visually summarizes the proposed relationships and guides the empirical research.

2.1. Hybrid Products

Hybrid products are a contemporary innovation in product development, created by combining two or more existing product or functionalities into a single offering. This integration results in multifunctional products that provide added value and introduces new features beyond what each individual component could offer separately to consumers (Morel, 2006, p. 97; Ulaga & Reinartz, 2011, p. 5). Morel (2006, p.97) refers to the trend of merging industries and technologies as the “convergence hype”, suggesting that future innovations lie in such hybrid developments. Hybrid products can be distinguished between two types; parity hybrids, which offer minimal additional value (e.g., a tv with a built-in video recorder), and enhanced hybrids, which provide new benefits (e.g., a phone with an integrated camera enabling instant photo sharing) (Morel, 2006, p. 97).

A challenge in marketing hybrid products is that they are inherently ambiguous. This is because they exhibit features of multiple categories, where they do not fit neatly into one, making them harder for consumers to evaluate (Morel, 2006, p. 97). A key challenge linked to hybrid food products is what Rajagopal and Burnkrant (2008, p. 232) refer as the “single category belief” issue, which is the tendency to assign a hybrid product to one familiar category and evaluate it based on the category’s typical attributes. As a result, their perceptions and expectations are shaped solely by the attributes of the selected category, rather than integrating elements from all contributing (Rajagopal and Burnkrant, 2008, p. 232). Nieroda et al. (2018, p. 159) confirms the single category belief, where understanding how consumers categorize hybrid products is essential, as it influences product design,

marketing positioning, and brand communication strategies. Misclassification can create an identity dilemma, as it remains uncertain which category consumers will prioritize the product (Nieroda et al., 2018, p.159). This poses a challenge for marketers, as it suggests that consumers might overlook significant product attributes when assessing the product (Rajagopal & Burnkrant, 2008, p. 232). At the same time, this ambiguity offers an opportunity, while it requires consumers to invest substantial effort in learning, this process also gives marketers the chance to shape how consumers mentally categorize and perceive the product (Moreau et al., 2001, p. 489).

Because consumers often lack a clear mental framework for hybrid combinations, they may perceive these products as confusing or unconventional (Morel, 2006, p.97). Beyond understanding how consumers evaluate hybrid products, it is also important to consider how they are likely to respond to new hybrids. Several factors influence this response (Morel, 2006, p.97). First, the appeal of a hybrid depends on the added value it provides beyond its individual components, where enhanced hybrids are generally more attractive than parity hybrids. Second, due to their inherent ambiguity, hybrids are often seen as complex, where consumers tend to react negatively to overly complex or unfamiliar products. Third, hybrid may be perceived as risky, both in terms of performance and durability, if one component fails, the entire product may lose its function. Altogether, these challenges suggest that consumers may initially view hybrid products with scepticism, making market success more difficult to achieve (Morel, 2006, p.102).

2.2. Hybrid Food Products

Hybrid food products (HFPs) are food innovations that combine elements from both animal-based and plant-based sources within a single product. They are meat-based products that incorporate varying proportions of plant-based ingredients, such as pulses, grains, fruits and vegetables (Grasso & Goksen, 2023, p.1). These products are intentionally developed to combine meat and plant-based ingredients into convenient, ready to cook formats such as burgers, sausages, or minced options (Ryder et al., 2023, p.2). While many processed meats are technically “hybrid” due to added non-meat components, the distinction lies in intent (Grasso & Jaworska, 2020, p.2). Traditional additives, such as fillers, extenders and binder, are included mainly for economic and technological reason, such as

improving texture or reducing costs. In contrast, hybrid meat products are deliberately formulated to include 25% to 50% plant-based proteins, not only for their functional benefits but also to communicate added value in terms of health, sustainability, and reduced meat consumption (Grasso & Jaworska, 2020, pp.1-7). The integration of plant proteins in these products is intended to contribute to nutritional qualities, support reduced meat consumption, and align with broader sustainability objectives (Grasso & Jaworska, 2020, pp.1-7).

HFPs are often positioned for flexitarian consumers, those who eat both meat and plant-based foods, who may prefer familiar taste profiles while reducing meat intake (Salgaonkar & Nolden, 2024, p. 2). Research indicates that although 90% of the consumers still consume red meat or poultry, around 34% regularly have meat-free days. HFPs may respond to this behaviour by offering a product format that does not require a full dietary shift (Grasso & Jaworska, 2020, p.2). Another study by Profeta et al. (2021, p.15) revealed that over 50% of consumers regularly or occasionally substitute meat. The research further showed that flexitarians are more receptive to animal-plant hybrids than completely vegetarian substitutes. However, consumer perceptions of hybrid meat products have not been extensively investigated, and it is unclear what elements might influence these items' success (Grasso & Jaworska, 2020, p.1).

Meat is widely valued for its nutritional value and is deeply tied to cultural symbols including heritage, masculinity and enjoyment (Salgaonkar & Nolden, 2024, p. 9). Although awareness of health, environmental and animal welfare issues has increased, many consumers still choose conventional meat over fully plant-based options. This is possibly due to issues with taste, texture, as well as emotional ties to meat, a concept known as meat attachment (reluctance to reduce meat intake) (Salgaonkar & Nolden, 2024, p. 9). Meat attachment is part of food neophobia, an individual's hesitation or unwillingness to try new or unfamiliar foods (Rabadán & Barnabéu, 2021. p.1). Higher levels of meat attachment are associated with a lower willingness to reduce meat intake or adopt substitutes. Additionally, meat also holds social value, often being viewed as essential for meals and as a key protein source. Therefore, consumers may view HFPs with scepticism, particularly when they closely mimic traditional meat (Salgaonkar & Nolden, 2024, p. 9). Meat alternatives aim to replicate key sensory attributes of animal meat, such as appearance, taste, and texture. These non-traditional products are designed to resemble meat in sensory and functional qualities,

offering consumers more dietary choices (Mercês et al., 2024, p. 2). Strong meat attachment and food neophobia reduce openness to adopting alternatives, with greater meat attachment associated with lower willingness to reduce consumption. Reducing meat attachment and food neophobia, while increasing familiarity and awareness of food sustainability are essential steps towards acceptance of HFPs (van Dijk et al., 2023, pp. 7-8).

Determining the most effective way to market these products in order to get them in front of consumers, primarily due to a lack of awareness and familiarity with hybrid meat (Salgaonkar & Nolden, 2024, p. 9), may be the biggest challenge. Therefore, consumer perceptions play a pivotal role in the success of hybrid products. Over time, greater exposure and knowledge may positively influence how these products are perceived (Ryder et al., 2023, p.4).

2.3. Marketing Tactics and Barriers for Hybrid Food Products

New product development is seen as a key strategy for achieving competitive advantage and long-term success in the global food industry (Costa & Jongen, 2006, pp. 457-459). Despite the high volume of new products introduced each year, failure rates remain substantial, with up to 50% products removed from the shelves within a year. This is often attributed to consumers resistance to change and preference for familiar foods. Still, consumption patterns are evolving, driven by growing consumer awareness of health, sustainability, and the environmental impact of food product. In this context, effective marketing tactics are essential to bridge the gap between innovation and consumer acceptance (Costa & Jongen, 2006, pp. 457-459).

Sustainability claims increasingly drive product marketing in the European food sector, with environmental claims accounting for over two-thirds of the observed growth in new product introductions (Nes et al., 2024, p.384). The effectiveness of sustainability claims and labels varies across product categories and countries. However, environmental claims in particular, could significantly contribute to trends in new product introductions (Nes et al., 2024, p.384). Research by Banovic et al. (2022, pp. 8-10), suggest that such claims can positively affect purchase intention towards HFPs. Similarly, Asioli et al. (2022, p.57) found that HFPs labelled with sustainability related cues, such as “Carbon Trust Label” increased

consumer acceptance, indicating that clear and credible sustainability claims on packaging can positively influence willingness to pay.

However, another study by Grasso and Goksen (2022, p.6) shows that, contrary to common assumptions, environmental concerns are not always the primary factor influencing purchasing decisions. Instead, health considerations frequently play a more dominant role in motivating consumers to shift away from exclusively meat-based products. Building on this, van Dijk et al. (2023, p.7) argue that in order to change consumers' neutral to more favourable attitudes, it is important to highlight both sustainability and health claims. These findings underscore the importance of clear, credible and evidence based communication. Grasso and Goksen (2022,p.6) emphasize that sustainability claims should be well-substantiated and transparent to maintain credibility and consumer trust. One way to support such credibility is through Life Cycle Assessments (LCAs), which provide measurable comparisons between HFPS and conventional meat, beyond just nutrition or taste (Grasso, 2024, p. 8694).

Recent research further suggests that consumer response to sustainability cues can vary depending on mindset. For example, indulgent consumers, who prioritize taste and short-term gratification, are less responsive to such sustainability cues and tend to judge products more on sensory appeal than on sustainability credentials (Smart & Pontes, 2023, pp. 1-7). However, consumers with a restraint mindset, those more focused on long-term health and ethical outcomes, perceive hybrid products with higher plant-based protein content as more sustainable, which positively influences their purchase intention. This “sustainability halo effect” suggest that even subtle cues, like the proportion of plant based ingredients, can enhance acceptance (Smart & Pontes, 2023, pp. 1-7). Based on these insights, we hypothesize that the presence of sustainability claims will positively influence consumer purchase intention (H1) and consumer attitudes (H2) toward HFPs .

H₁: The presence of sustainability claims will lead to higher purchase intentions of hybrid food products compared to when sustainability claims are absent.

H₂: The presence of sustainability claims will lead to more positive attitudes towards hybrid food products compared to when sustainability claims are absent.

A key challenge as seen in the study by Morel (2006, pp. 97-98), is that hybrids are ambiguous, in which they can be placed in multiple categories based on different views of individuals. Therefore, HFPs can be misplaced, and individuals could assign them in a category where they do not belong. These findings align with the research of Salgaonkar & Nolden (2024, p.8), which indicates that consumer confusion hinders HFPs adoption. Since HFPs are neither fully meat nor fully plant-based, they lack a clear category, making it difficult for consumers to develop expectations about taste, health benefits, or ethical implications Salgaonkar & Nolden (2024, p.8). For instance, a hybrid burger containing both meat and vegetables may be classified as either a meat burger or a vegetable burger, leading to misclassification and consumer confusion. In contrast, non-hybrid products are less likely to be miscategorized since their category membership is clearer and leaves less room for misunderstandings (Morel, 2006, pp. 97-98). This confusion presents marketing challenges: mis categorization makes hybrids harder to position, demanding greater cognitive effort from consumers. Profeta et al. (2021, p.15) confirms this by acknowledging that consumers are unfamiliar with the meat hybrids that are on the market.

Categorization strongly influences consumer attitudes, as product evaluations often depend on how a product is framed (Rajagopal & Burnkrant, 2008, p. 232) Moreau et al (2001, p.490) continues that consumers learn about unfamiliar products by drawing on familiar categories through a three-step process: accessing a known category, mapping similarities, and transferring knowledge. Marketers can support this process by assigning a clear and credible category label, allowing consumers to relate the product to familiar ones. This not only enhances overall perception but also focuses attention on features associated with the chosen category (Moreau et al., 2001, p. 490). As a result, consumers will tend to rely on that single category when forming judgments, even if the product spans multiple categories. Ultimately, initial categorization guides how ambiguous or missing information is interpreted, shaping consumer understanding and preferences (Moreau et al., 2001, p. 490). Therefore, it is hypothesized that categorizing HFPs as meat rather than vegetarian leads to higher purchase intentions (H3) and more favourable attitudes (H4).

H₃: Categorizing hybrid food products as a meat product will result in higher purchase intentions compared to categorizing hybrid food products as vegetarian product.

H₄: Categorizing hybrid food products as a meat product will result in better attitudes towards hybrid food products compared to categorizing hybrid food products as vegetarian product.

A related challenge to mis categorization is that many consumers remain unfamiliar with HFPs, making it difficult to differentiate them from conventional or fully plant-based alternatives (Grasso, 2024, p. 8694). The effect of hybridity on categorization appears to be limited when consumers are unfamiliar with the products they are asked to categorize (Morel, 2006, p. 97). This consumer limited familiarity with HFPs contributes to confusion and hesitancy in adoption (Salgaonkar & Nolden, 2024, p.8). When consumers do become more familiar with HFPs and gain a better understanding of their ingredients, they are more likely to view these products as appealing and as an acceptable dietary option, which is an essential step in forming a favourable opinion needed to influence their purchasing decision (Ryder et al., 2023, p.4). This highlights the potential role of consumer familiarity as a moderator in the relationship between categorization and sustainability cues influencing purchase intention. Therefore, we hypothesize that consumer familiarity moderates the relationship between product categorization and sustainability claims on purchase intentions, such that the effects are stronger among consumers with higher familiarity.

H_{5a}: The relationship between sustainability claims and purchase intention is moderated by consumer familiarity, such that the effect is stronger with low familiarity with hybrid food products.

H_{5b}: The relationship between product categorization and purchase intention is moderated by consumer familiarity, such that the effect is stronger with low familiarity with hybrid food products.

In addition to unfamiliarity, other barriers to adoption include taste and texture expectations, as sensory attributes do not always meet consumer expectations, potentially leading to lower repeat purchases (Grasso & Jaworska, 2024, p.1888). Baune et al. (2023, p. 2) discuss how taste remains a major barrier to the acceptance of meat substitutes, with many consumers unwilling to sacrifice flavour for health. Ultimately, achieving the right balance between taste, texture and nutritional quality is essential for consumer acceptance of HFPs (Baune et al., 2023, p. 2).

Moreover, pricing plays a critical role, as consumers are often reluctant to pay a premium for HFPs, highlighting the importance of competitive pricing strategies (Grasso, 2024,

p.8694). This is confirmed by the study of Ryder et al., (2023, p. 8), where negative responses to HFPs were related to the product being expensive, overpriced and unaffordable. Baune et al. (2023, p.9) mentions that only 20% of consumers would be willing to pay more for a meat hybrid compared to a corresponding meat product. Continuing, Salgaonkar & Nolden (2024, p.7) found that consumers were more sensitive to pricing when selecting HFPs compared to plant-based alternatives. This indicates that competitive pricing strategies, alongside clear communication of value, are important for improving consumer willingness to purchase HFPs.

Lastly, in the study done by Ryder et al., (2023, p.4) perceptions become more positive when consumers participate in the co-creation process of producing hybrid meat products. Following the co-creation process, positive terms like "nutritious" and "tasty" rise while negative words like "expensive" or "tasteless" fall, in which the positive associations with taste and nutrition are crucial for consumer acceptance. According to Grasso and Goksen (2022, p.6) in Europe, co-creating hybrid meat products with customers worked well, with a focus on openness and participation to meet their demands for natural, minimally processed components. Through active involvement in the creation of HFPs, consumers shift their focus from surface-level ingredients to the product's nutritional value, which could suggest that co-creation may enhance consumer awareness of nutrition and healthier eating choices, which results in more trust and stronger purchase intentions (Ryder et al., 2023, p. 5-9). Viewed on its own, this presents a mixed outcome for the HFPs market. On the one hand, it suggests that consumers respond very positively once they become familiar with the product and have insight or input into its composition. On the other hand, it underscores the importance of educating consumers about HFPs and their ingredients, as initial reactions prior to co-creation were notably more negative (Ryder et al., 2023, p. 4).

Strategic marketing approaches are needed to enhance HFP adoption, as previous efforts have struggled to establish a lasting position due to consumer confusion, failing to capture consumer interest and differentiate themselves from conventional meat options (Grasso, 2024, p.8694). Sustainability messaging is widely used, yet its effect on purchase intention and consumer attitudes remains understudied. Since categorization affects positioning, it is crucial to examine whether labelling HFPs as meat or vegetarian impacts purchase intent and attitude. Consumer familiarity also plays a key role in shaping purchase decisions, as less familiar consumers may rely more on external cues like sustainability claims

and product categorization to form their perceptions, potentially amplifying their impact on purchase intention.

2.4. Consumer behaviour regarding Hybrid Food Products

Consumer food choices are influenced by a combination of psychological, economic, sociocultural and cognitive factors. Understanding how these factors affect consumer expectations is essential when developing innovative products (Salgaonkar & Nolden, 2024, p. 1).

To better understand how consumers evaluate unfamiliar products like HFPs, this study draws on the Theory of Planned Behaviour (TPB) (Ajzen, 1991). According to TPB, behaviour is determined by three components: attitudes, subjective norms, and perceived behavioural control. A positive attitude, strong social norms, and high perceived control increase the likelihood of behavioural intention and ultimately the behaviour itself, increasing the likelihood of action (Ajzen, 1991, p.188), including purchasing HFPs. Attitudes are driven by behavioural beliefs, which are expectations about the outcomes of performing the behaviour, which are evaluated as positive or negative. Subjective norms reflect the perceived expectations of significant others, such as friends or family. Perceived behavioural control refers to an individual's belief in their ability to perform the behaviour, even in the presence of potential barriers (Ajzen, 1991, p.188).

In the food domain, TPB has proven useful for predicting intention. Chilón-Troncos et al. (2024) examined how TPB elements influence consumers' willingness to consume healthy brand foods, highlighting that food labels provide objective dietary information. The researchers found that higher nutritional literacy fosters more positive attitudes, stronger perceived control and greater influence of subjective norms. These factors, defined by objective information like food labels and from social environments, significantly affect willingness to adopt other diets and purchasing decisions (Chilón-Troncos et al., 2024, pp.8-9). As such, social and psychological variables, including perceived control and subjective norms, are relevant in understanding consumer behaviour and will be included as control variables in this study.

From a cognitive perspective, the hesitation toward HFPs may be linked to how consumers process information. Theoretically, product evaluation can follow two routes:

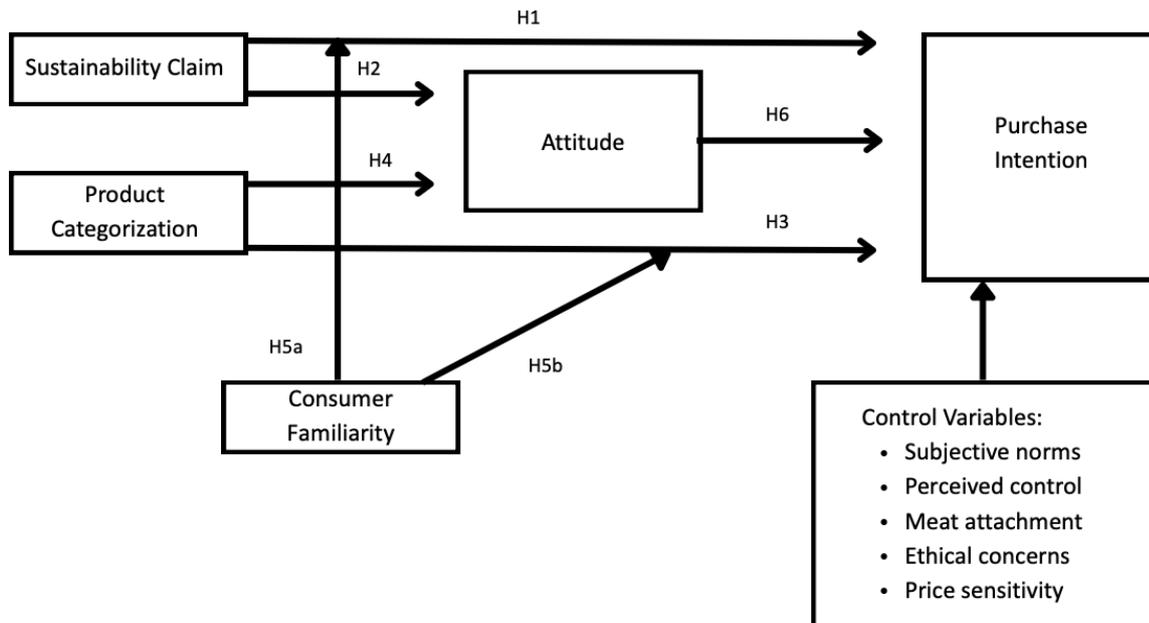
analytic or holistic processing (Morel, 2006, p.102). In analytic processing, consumers assess each source product's attribute separately and integrate them into an overall judgment. In contrast, holistic processing treats the hybrid as a unified whole, without breaking it down into parts. Since hybrids combine elements from distinct categories, understanding which type of processing consumers use could offer valuable insights (Morel, 2006, p.102).

In addition, this study considers attitude as a central concept in explaining consumer intention. Attitude is defined as a psychological tendency reflected in an individual's evaluation of a specific entity, either positively or negatively (Annunziata & Scarpato, 2014, p. 358). Because attitudes significantly influence food choice behaviour, they serve as a useful framework for understanding consumer food preferences. Attitudes toward a product are formed by beliefs about its attributes and subjective value placed on those attributes (Annunziata & Scarpato, 2014, p. 358). The stronger and more positive the beliefs, the more favourable the attitude (Ajzen, 2008, pp. 530-532). Therefore, attitudes do not just explain why consumers might prefer certain food products, they are also predictive of whether consumers will actually intend to buy the food products. Because attitudes influence food choice behaviour, they are a useful framework for understanding consumer food preferences and can serve as a reliable predictor for purchase intention, which refers to a consumer's willingness or tendency to buy a specific product under certain conditions (Mirabi et al., 2015, p. 268). Therefore, it serves as a useful predictor of actual buying behaviour, which plays a critical role in how consumers assess and respond to a product.

Finally, this study includes several control variables that are known to influence food choices, in addition to subjective norms and perceived behavioural control. Price sensitivity affects willingness to try HFPs, especially when their value is not clearly communicated (Grasso, 2024, p.8694). Meat attachment, or the emotional and cultural bond to meat, can lower openness to alternatives (Salgaonkar & Nolden, 2024, pp.7-9). Salgaonkar & Nolden (2024, p.8) also mention that ethical norms, including social and environmental values could potentially hinder the acceptance of HFPs, which is likely due to social concerns. Consumers may avoid these products to prevent social judgement, especially in public settings. Based on these insights, this study investigates whether a positive consumer attitude toward HFPs significantly predicts purchase intention, including several control variables to account for alternative explanations. Therefore, it is hypothesized that consumer attitude positively predicts purchase intention toward HFPs.

H₆: More positive attitudes towards hybrid food products will be associated with higher purchase intentions

2.5. Conceptual Framework



3. Methodology

This chapter outlines the methodological approach used to examine the effects of sustainability claims and product categorization on consumer attitudes and purchase intentions toward HFPs. It begins with an explanation of the research design and experimental procedure, followed by a description of the stimulus material and measures, which details the operationalization of key variables. Next, the sampling strategy is presented. Finally, the ethical concerns, reliability and validity are discussed.

3.1. Research Design

An experimental design within a survey was selected for this study to assess the cause-effect between the variables. The experimental design allowed for a controlled manipulation of two independent variables (sustainability claims and product categorization) and tested their causal relationship on the dependent variable purchase intention, both directly and indirectly through the mediator attitude, by comparing what happened when the stimulus was present to what happened when it was not (Babbie, 2020, pp. 225-226). Additionally, this experimental approach allowed for the investigation of how consumer familiarity moderated the effects of sustainability claims and product categorization on purchase intention, providing insights into how marketing tactics influence HFP adoption and whether familiarity strengthened or weakened these relationships.

A 2 (Product Categorization: Meat vs. Vegetarian) × 2 (Sustainability Claims: Present vs. Absent) between-subjects design was employed. A between-subjects design minimizes the demand effects, which refer to the tendency of participants to answer in a way that aligns with the perceived expectations of the experimenter (Neuman, 2014, Ch.9). By randomly assigning participants to different conditions, the design reduced the risk of biases introduced by order effects and ensured that the responses were not influenced by prior exposure to other conditions. Moreover, the random assignment of participants to the four experimental conditions guaranteed that each participant had an equal probability of being assigned to any condition, enhancing the validity of the experiment (Neuman, 2014, Ch.9).

The manipulation checks helped ensure that any observed effects on purchase intentions and attitudes could be attributed to the manipulation of the independent variables, while maintaining control over other potential factors, such as the control variables

of this study. In addition to the independent and moderating variables, several control variables were included to account for alternative explanations of consumer attitudes and purchase behaviour. These control variables were selected based on prior literature and included: price sensitivity (Alford & Biswas, 2002), meat attachment (Kühn et al., 2023), ethical concerns (Treviño et al., 2007), and the TPB components subjective norms and perceived behavioural control (Ajzen, 2006).

3.2. Materials

3.2.1. Stimuli

The advertisements were designed in a way that resembles online advertisements commonly encountered by consumers. The HFP in the advertisements was a hybrid burger combining both plant-based and meat ingredients. Each advertisement was designed to match the style and tone of typical online food advertisements found on social media platforms, with clear and simple language to increase the realism of the experiment. The decision to use a hybrid burger as the stimulus product was based on its familiarity and prevalence in the marketing, making it a relatable and realistic example of an HFP. In addition, all advertisements were kept consistent in structure, with each advertisement being approximately 50 words in length.

A pre-test was conducted to confirm that participants correctly perceived the sustainability claim and product categorization in the advertisements. In the initial pre-test, 27 participants were recruited, however, 8 participants gave incorrect responses to the manipulation checks. As a result, the advertisement was adjusted by highlighting key words related to the sustainability claim and product categorization in green to ensure participants would focus on these aspects. A second pre-test was conducted with 19 participants, which resulted in only 2 incorrect answers (one for the sustainability claim and one for product categorization). This adjustment ensured that the manipulation was clearer and easier to comprehend. Product categorization was manipulated by categorizing the hybrid food product as either a beef burger (for the meat categorization condition) or as a vegetarian burger (for the vegetarian categorization condition). In the sustainability claim condition, the advertisement highlighted the environmental benefits of the product, emphasizing the reduction of carbon emissions due to its plant-based ingredients. In the no sustainability

claim, the advertisement did not mention any environmental aspects (See appendix B for the stimuli).

3.2.2. Measures

The dependent variable, purchase intention was measured using five items adapted from established scales. One item was adapted from the Juster scale (Seymour et al., 1994), a validated purchase probability scale designed to estimate likelihood of buying across consumer goods. Additional items were drawn from Kim and Lennon (2000), originally phrased as likelihood questions on a seven-point scale (e.g., “How likely is it that you will buy the apparel item you viewed today in the next 12 months?”). These were converted into agreement statements to match the Likert format (e.g., “It is likely that I will buy the hybrid food product in the next 12 months”). This modification was deemed suitable for the context of this study, as the semantic meaning of the original items is preserved, and the Likert-style format ensures greater consistency across all survey measures. The last items were drawn from Diallo (2012) and Moon et al. (2008) assessing perceived purchase intention.

The mediator, attitude, was measured using items from the Food Attitude scale (Aikman et al., 2006), originally developed for ethnic cuisine but adapted here for hybrid food products. Although originally developed to assess attitudes toward ethnic cuisine, the FAS was deemed suitable for this study since HFPs similarly represent a novel and unfamiliar food category, allowing the scale to effectively capture consumers attitudes and evaluate responses toward such non-traditional foods. The minor modification to the original items involved references to “Thai food” with “hybrid burgers” (e.g. “I feel enthusiastic about eating Thai food” to “I feel enthusiastic about eating hybrid burgers). One additional item was taken from Russel and Hollander (1975). In total, 12 items were used, assess on a five-point Likert scale.

Consumer familiarity, the moderator of this study, was assessed with five items adapted from Mittal (1995), Casaló et al. (2007), and Söderlund (2002). All items used a five-point Likert scale. An example item is: “I am quite familiar with hybrid food products.”

For one of the control variables, price sensitivity, the question was not based on a validated scale but developed by the researcher. The question included is “Indicate how much you would be willing to pay for a hybrid burger (only for the burger, so without the bun

and toppings)". A slider was positioned underneath the question in which people could indicate how much they would be willing to pay. The range was between €0 - €10.

For the control variables from the theory of planned behaviour, the scale developed by Ajzen (2002, 2006), subjective norms, and perceived behavioural control, are utilized. Attitudes was excluded from this section since this is already measured in detail as a mediator variable. These constructs were measured using items adapted from Ajzen (2002, 2006), Kumar and Smith (2017), and Qi (2021), using a five-point Likert scale. In total, six items were included (three for each construct). Example item for subjective norms: "Most people who are important to me approve of eating hybrid food products". Example item for perceived behavioural control: "If I wanted to, it would be possible to eat hybrid food products". The original item of Qi (2021) was modified: "purchasing green food can make me gain face". Since not everyone would be able to understand this phrase, the researcher decided to change the last few words with the same meaning for better understanding for the participants.

For the control variable meat attachment, the MEAS scale was used, developed by Kühn et al., (2023). Assessed using a five-point Likert scale (1=Strongly agree, 5= Strongly disagree). Meat attachment was measured with six items, an example item includes: "I love meals with meat".

For the last control variable, ethical concerns, the scale developed by Treviño et al., (2007) was utilized which measures ethical conduct, concern for ethics and ethics in everyday life and decision making. Three items were adapted and measured on a five-point Likert scale. Example item: "I regularly show that I care about ethics and values while choosing food products". The full list of adapted items, their original sources and any modifications can be found in appendix C.

To ensure that participants noticed the manipulation, manipulation checks were included. Participants were asked whether they noticed the sustainability claim (did the advertisement include a sustainability claim? Yes/No/Not sure) and how they would categorize it (How was the burger categorized? Beef burger/Vegetarian burger/Not sure). The manipulation checks were positioned at the end of the survey to avoid priming effects, ensuring participants responses were not biased by an increased awareness of the advertisement manipulations. This placement helped preserve the internal validity of the

study while still verifying whether the participants noticed the categorization and sustainability cues.

3.3. Sampling

This study employed a combination of convenience and snowball sampling techniques to recruit participants residing in the Netherlands. Participants were initially recruited via the researcher's personal network and social media platforms, including Instagram, Facebook, and LinkedIn. In addition, the survey was shared through websites such as SurveyCircle and SurveySwap. To broaden the reach and diversify the sample, participants were encouraged to share the survey with others in their network, helping to access participants from different regions and demographic backgrounds. While this sampling approach does not guarantee representativeness, it enabled the collection of a varied sample in an efficient and practical manner.

A total of 120 participants (30 per condition) needed to be assigned to one of four experimental conditions in a 2x2 factorial design (Janssen & Verboord, 2024-2025). The data collection period lasted from 1 to 9 May 2025 using Qualtrics, an online survey platform. In total, 290 participants were recruited, where after removing incomplete responses, a total of 171 valid responses remained for analysis. Participants were randomly assigned to one of the four conditions, which ensured that each participant had an equal probability of being exposed to any of the experimental conditions.

Participants were fairly evenly distributed across the four experimental conditions, ensuring that comparisons across conditions remained valid and unaffected by sampling imbalance: beef burger without sustainability claim ($n = 45$), beef burger with sustainability claim ($n = 43$), vegetarian burger without sustainability claim ($n = 39$), and vegetarian burger with sustainability claim ($n = 44$).

3.4. Ethical Consideration, validity and reliability

Although no research is entirely free from limitations, several methodological decisions were taken to strengthen the ethical integrity, validity and reliability of this study. The study was conducted in accordance with standard ethical research guidelines. Participants were recruited via the online platform Qualtrics, and informed consent was obtained from all

participants before participation. Participants were fully informed about the study's purpose, and the consent form clarified the voluntary nature of the study, assuring anonymity. To minimize potential discomfort, questions were neutral and non-judgmental, avoiding any language that may trigger guilt or shame regarding eating habits. Participants were therefore assured that there were no right or wrong answers. Participants had the right to withdraw at any time without consequences. No personal identifiable information was collected, and data was handled confidentially in accordance with Erasmus standards.

To strengthen internal validity, all measurement scales were based on validated instruments from previous research (see Appendix C). Multiple items were used per construct (e.g., attitude and purchase intention) to capture a broad representation of each concept. This ensured adequate content coverage and allowing for triangulation (Neuman, 2014, Ch.9). Furthermore, to ensure that any observed effects on the dependent variable could be attributed specifically to the independent variable under investigation, control variables were included. Random assignment to the four experimental conditions was ensured via the built-in randomization function in Qualtrics, which reduced the impact of participant related biases. Additionally, only individuals that are currently living in the Netherlands were considered in the analyses, improving sample relevance. While a convenience sample might reduce external validity, the use of random assignment increases generalizability of results across similar consumer populations in the Netherlands. Manipulation check questions were embedded at the end of the survey to assess whether the participant perceived the intended differences in sustainability claim and product categorization and to ensure manipulation recognition. Although some manipulation checks showed lower recognition of the sustainability claim and product categorization, the integrity of random assignment was preserved by retaining all participants in the analysis.

To assess reliability, Cronbach's alpha was calculated for alle multi-item scales. All constructs showed acceptable to high reliability, indicating that the items within each scale were sufficiently correlated. Additionally, factory analysis was performed to verify that scale items loaded appropriately on their intended constructs. Prior to analysis, the dataset was cleaned by removing incomplete responses, preview tests, and outliers based on response time.

Finally, hypotheses were tested using multiple regression analyses. This statistical technique allows for assessing the individual and combined effects of independent variables

on the dependent variable while accounting for relevant control variables. The analyses were conducted using SPSS, where model assumptions such as linearity, normality, and homoscedasticity were checked to ensure the reliability of the regression results. Moreover, in comparison to field or laboratory experiments, conducting the study online enhanced external reliability by offering a more natural environment for participants and making it easier for other researchers to replicate and control the experimental conditions.

4. Results

This chapter begins with a summary of the sample characteristics. This is followed by the reliability and factor analyses. Next are the descriptive statistics and correlations among the variables and the manipulation check analysis. Lastly, the results of the hypothesis testing are reported using the statistical software SPSS.

4.1. Sample Characteristics

Participants were recruited from 1 to 9 May 2025 via Qualtrics. A total of 290 participants were collected, which exceeded the required minimum size of 120 participants. After data cleaning, which involved removing 8 preview cases, 100 incomplete or too quickly completed responses (under two minutes), and 10 participants who did not reside in the Netherlands, the final dataset included $N= 171$ valid responses that qualified for further analysis. Of these 171 participants, 64.9% ($n = 111$) identified as female and 36.1% ($n = 60$) as male.

Participants ranged in age from under 18 to over 65, with the majority falling in the 18-25 age group (36.3%), followed by 50-57 (21.6%) and 58-65 (17.5%). Most participants are from the Netherlands (95.3%), with a few participants from countries such as Germany, India, China etc., all accounting for one participant. Regarding education, 39.2% ($n = 67$) had completed a bachelor's degree, 28.1% ($n = 48$) held a master's degree, and 25.7% ($n = 44$) had obtained a high school diploma.

Table 4.1.1: Sample Characteristics

Characteristics	Frequency in sample	Percentage of sample
Gender		
Male	60	35.1
Female	111	64.9
Age		
<18	2	1.2
18-25	62	36.3
26-33	18	10.5
34-41	3	1.8
42-49	16	9.4
50-57	37	21.6
58-65	30	17.5
>65	2	1.2
Country		
Angola	1	.6
Belgium	1	.6
Bolivia	1	.6
China	1	.6
Germany	1	.6
India	1	.6
Italy	1	.6
Netherlands	163	95.3
Romania	1	.6
Education		
Less than high school	4	2.3
High school or equivalent	44	25.7
Bachelor's or equivalent	67	39.2
Master's or equivalent	48	28.1
Doctoral or equivalent	8	4.7

4.2. Psychometric properties of the measurement scales

To examine the dimensionality and reliability of the multi-item measures, a series of Principal Components Analyses (PCA) were conducted using varimax rotation. An eigenvalue > 1 and factor loadings $> .40$ were used as cut-off criteria for factor retention and item interpretation. Reliability was assessed using Cronbach's alpha, with $\alpha > .70$ considered acceptable.

The first factor analysis was performed on the five items measuring purchase intention. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was .874, indicating a high level of suitability for factor analysis. Bartlett's Test of Sphericity was significant, $\chi^2(10) = 772.91, p < .001$, confirming the presence of sufficient correlations among the items. One factor emerged with an eigenvalue greater than 1, explaining 80.24% of the variance. All items showed high loadings on this factor (ranging from .812 to .926). The internal consistency of this scale was excellent, with a Cronbach's alpha of $\alpha = .94$,

To examine the dimensionality of the attitude scale, another Principal Component Analysis (PCA) with varimax was performed. Initial results showed three components. However, after evaluating cross-loadings and interpretability, four items were removed to improve construct clarity and one-dimensionality. The revised PCA with the remaining eight items showed strong sampling adequacy (KMO = .849) and a significant Bartlett's test of sphericity $\chi^2(28) = 758.004, p < .001$. The analysis yielded one clear component with an eigenvalue above 1.0, explaining 57.38% of the total variance. All eight items had strong loadings on this single factor (ranging from .677 to .823), confirming the scale's coherence. The Cronbach's alpha for the final attitude scale was $\alpha = .90$.

The initial analysis for the structure of the consumer familiarity scale, yielded two components. However, one item ("Which hybrid food product I buy matters to me a lot") showed cross-loadings and was therefore removed. A follow-up PCA with the remaining four items showed adequate sampling adequacy (KMO = .751) and a significant Bartlett's Test of Sphericity, $\chi^2(6) = 376.48, p < .001$, supporting factorability. The analysis extracted one component with an eigenvalue above 1, explaining 70.09% of the total variance. All four items loaded strongly on this factor (ranging from .640 to .909). The reliability test showed $\alpha = .85$, indicating good internal consistency.

For the subjective norm's variable, the KMO was .666 and the Bartlett's Test of Sphericity was also significant $\chi (6) = 185.07, p < .001$. One component emerged, explaining 57.28% of the total variance. All four items demonstrated strong loadings on this single factor, ranging from .717 to .816, indicating that they measured the same underlying construct. The internal consistency of the scale was acceptable, with a Cronbach's of $\alpha = .75$.

Perceived behavioural control showed KMO = .666, which is considered acceptable. The Bartlett's Test of Sphericity was significant $\chi (3) = 84.867, p < .001$. One factor was extracted, explaining 58.93% of the variance. All three items loaded clearly (.666 - .872). Reliability was slightly below the conventional threshold ($\alpha = .65$), but acceptable for exploratory research with few items. Therefore, all three items were retained.

The data for the meat attachment variable were deemed suitable for factor analysis as indicated by the KMO measure, KMO = .831, and a significant Bartlett's Test of Sphericity, $\chi (15) = 580.438, p < .001$. One factor with eigenvalue greater than 1 emerged, explaining 63.30% of the total variance. All six items loaded strongly onto this single factor (ranging from .720 to .864). The internal consistency was high ($\alpha = .88$).

For the last scale, ethical concerns, the KMO measure was .754, indicating a good level of sampling adequacy. Bartlett's test of sphericity was significant, $\chi (3) = 376.64, p < .001$. One component with an eigenvalue greater than 1 emerged, explaining 86.17% of the total variance. All three items loaded strongly on this single factor (ranging from .911 to .939). The reliability of the scale was high, with Cronbach's alpha of $\alpha = .92$.

Table 4.2.1. displays the means, standard deviations, and Pearson correlations for all main variables in the study. The strongest correlations were found between purchase intention and attitude towards the hybrid burger ($r = .75, p < .001$). Most variables demonstrated significant associations in the expected directions. The full factor analysis can be found in Appendix D.

Table 4.2.1: Descriptive statistics and correlations ($n = 171$)

* $p \leq .05$, ** $p \leq .01$ (2-tailed).

	1	2	3	4	5	6	7	8	9	10	11	Mean	SD
1. Purchase Intention	-											2.81	1.21
2. Attitude	.75**	-										3.1	.86
3. Familiarity	.34**	.37**	-									1.94	.94
4. Norms	.47**	.55**	.47**	-								2.25	.83
5. Control	.25**	.28**	.27**	.30**	-							3.43	.90
6. Meat attachment	.08	.00	.04	-.07	.31	-						3.40	1.02
7. Ethical Concerns	.09	.270*	.18*	.23**	.21*	-.44**	-					3.49	.84
8. Price	.22**	.34**	.03	.27**	.27**	.00	.07	-				3.14	1.72
9. Sustainability Claim (Condition)	.04	.02	.00	.04	.06	.00	.07	.22	-			.51	.50
10. Product Categorization (Condition)	.03	.03	.05	.03	.07	.07	.04	.09	.59	-		.49	.50
11. Sustainability Recognition (manipulation check)	-.06	-.06	-.11	-.11	-.00	-.05	-.13	.62	.09	.13	-	2.10	.93
12. Categorization Recognition (manipulation check)	-.10	-.15	.05	-.07	.03	.07	-.08	.19	-.01	.16*	.13	1.88	.80

Note: variables 9-10 represent the experimental condition assignments (dummy coded). Variables 11-12 represent the manipulation check measures based on participant's recognition of the sustainability claim and product categorization

4.3. Manipulation checks

To assess the effectiveness of the experimental manipulation, participants were presented with two manipulation check questions at the end of the survey. The first question assessed whether participants noticed the sustainability claim in the advertisement (“Did the advertisement include a sustainability claim?”) and the second addressed the product categorization (“How was the hybrid burger categorized?”). Table 4.3.1. presents the proportion of participants who answered these checks correctly. Of the total 171 participants, 65 (38%) correctly identified the presence or absence of the sustainability claim in line with their condition, while 94 participants (55%) correctly identified the product type. This suggest that the manipulation of product categorization was relatively more successful than the manipulation of sustainability claim presence. However, a substantial proportion of the sample failed to correctly identify the sustainability claim manipulation. Notably, no participants were excluded from analysis based on their manipulation check performance. This decision was made to preserve statistical power and maintain the integrity of random assignment across conditions.

Table 4.3.1: Manipulation check

Manipulation Check	Correct	Incorrect	% Correct
Sustainability Claim	65	106	38%
Product Type	94	77	55%

To provide a more detailed understanding of how the manipulations were perceived, table 4.3.2. presents the responses to the sustainability claim manipulation check question per experimental condition. In the No Claim conditions (No Claim + Beef and No Claim + Vegetarian), the correct response was “no”, while in the Claim conditions (Claim + Beef and Claim + Vegetarian), the correct response was “yes”. Accuracy was highest in the No Claim conditions: 84.4% (No Claim + Beef) and 79.5% (No Claim + Vegetarian) correctly answered “no”. In the Claim + Vegetarian condition, 74.3% correctly identified the claim’s presence. However, only 48.6% did so in the Claim + Beef condition, while the rest either missed it or were unsure. This could potentially suggest that the sustainability claim was less salient or convincing in the Beef version of the advertisement than in the vegetarian version. In

conclusion, participants were better at correctly identifying the absence of a sustainability claim than its presence. Recognition was especially low in the Claim + Beef condition, where nearly half of participants failed to notice the claim. These results indicate that sustainability claim manipulations were more effective in the vegetarian conditions and suggest potential differences in attention or perceived relevance depending on product framing.

Table 4.3.2: Manipulation check per condition – Sustainability Claim

Condition	Yes	No	Not Sure
No Claim + Beef	15.6%	84.4%	0%
Claim + Beef	48.6%	48.6%	2.7%
No Claim + Vegetarian	20.5%	79.5%	0
Claim + Vegetarian	74.3%	22.9%	2.9%

Lastly, to evaluate whether participants correctly perceived the categorization of the hybrid burger, table 4.3.2. includes the responses to the second manipulation check question: “How was the hybrid burger categorized?” In the Beef Conditions (No Claim + Beef and Claim + Beef), the correct response was “Beef”, while in the Vegetarian conditions (No Claim + Vegetarian and Claim + Vegetarian), the correct response was “Vegetarian”. Accuracy was highest in the vegetarian conditions: 82.9% (Claim + Vegetarian) and 76.9% (No Claim + Vegetarian) correctly identified the product as vegetarian. In contrast, recognition was lower in the beef conditions, with 71.1% (No Claim + Beef) and only 56.8% (Claim + Beef) correctly identifying the categorization. In conclusion, the categorization manipulation was most effective in the Claim + Vegetarian condition. Overall, participants were more accurate in identifying the product as vegetarian than beef. This may indicate that the vegetarian framing was more cognitively easier to process in the context of HFPs.

Table 4.3.3: Manipulation check per condition – Product Categorization

Condition	Beef	Vegetarian	Not Sure
No Claim + Beef	71.1%	28.9%	0%
Claim + Beef	56.8%	40.5%	2.7%
No Claim + Vegetarian	0%	76.9%	23.1%
Claim + Vegetarian	0%	82.9%	17.1%

4.4. Hypothesis testing

Prior to testing the hypotheses, multicollinearity was assessed to ensure that the independent variables did not exhibit problematic intercorrelations. A linear regression analysis was conducted with purchase intention as the dependent variable, including all predictors and control variables used in the hypothesis testing. The collinearity diagnostics showed that all Variance Inflation Factors (VIF) were well below the commonly accepted threshold of 5 (all VIF values were below 1.51), and all tolerance values exceeded 0.66. These results indicate that multicollinearity was not a concern. To assess the assumptions of the regression analyses predicting attitudes towards hybrid food products, another multicollinearity was tested among the independent variables. All VIF values were below 1.51 and all tolerance values exceeded 0.66, indicating no evidence of multicollinearity. Therefore, all variables were included in the analysis.

To test the hypotheses, two multiple linear regression models were conducted: one with attitude as the dependent variable (H2 and H4) and one with purchase intention as the dependent (H1, H3, H5, H6). Both models included the same set of independent variables, sustainability claim and product categorization. As well as the control variables, subjective norms, perceived control, meat attachment, ethical concerns, and price. For the model predicting purchase intention, two interaction terms were manually computed and included: the interaction between sustainability claim and familiarity, and between categorization and familiarity. These were created using mean-centred variables to reduce multicollinearity and to properly test the hypothesized moderation effects. Table 4.4.1. summarizes the coefficients relevant for each hypothesis.

4.4.1. Main effects on the dependent variables Attitude and Purchase Intention

To test H1, which stated that the presence of sustainability claims will lead to higher purchase intentions compared to when sustainability claims are absent, the regression model with purchase intention as the dependent variable was used. The overall model was significant $F(11, 164) = 23.55$ $p < .001$, explaining 61.2% of the variance in attitude ($R^2 = .612$), indicating substantial predictive power. However, the direct effect of sustainability claim on purchase intention was not statistically significant, $\beta = -.13$, $t = -1.09$, $p = .279$, 95%

CI (-.37, .11). This suggests that participants who were exposed to a sustainability claim did not report significantly higher purchase intentions for HFPs than those who were not exposed to such a claim. Therefore, H1 is not supported.

H2, which proposed that the presence of sustainability claims would lead to more positive attitudes towards HFPs compared to when sustainability claims are absent, was examined with the regression model predicting attitudes. The overall model was statistically significant, $F(8, 167) = 15.56$ $p < .001$, explaining 42.7% of the variance in attitude ($R^2 = .427$), indicating substantial predictive power. However, the effect of sustainability claims on attitude was not statistically significant, $\beta = -.11$, $t = -1.02$, $p = .309$, 95% CI (-.31, .10). This suggests that participants who were exposed to a sustainability claim did not report significantly more positive attitudes towards HFPs than those who were not exposed to such a claim. Therefore, H2 is not supported.

H3 proposes that categorizing HFPs as meat product would result in higher purchase intentions to categorizing them as vegetarian products. In the model with purchase intention as the dependent, the effect of product categorization was non-significant $\beta = -.01$, $t = -.01$, $p = .909$, 95% CI (-.25, .23). This suggests that categorizing HFPs as beef did not lead to significantly higher purchase intentions compared to categorizing them as vegetarian. Therefore, H3 is not supported.

To test H4, which states that categorizing hybrid food products as a meat product will result in better attitudes towards HFPs compared to when categorized as a vegetarian product, the regression model with attitude as the dependent variable was used. The coefficient for product categorization was not statistically significant, $\beta = -.05$, $t = -.51$, $p = .611$, 95% CI (-.26, .15). This suggests that whether the HFP was framed as meat-based or vegetarian did not significantly influence consumer attitudes. Therefore, H4 is not supported.

To test H5, which proposed that the relationship between sustainability claims, product categorization and purchase intention is moderated by consumer familiarity with HFPs, two interaction terms (sustainability claim x familiarity and product categorization x familiarity) were included in the model to account for potential moderation effects on purchase intention. However, the interaction effects were not statistically significant. The interaction between sustainability claim and familiarity was not significant ($\beta = .16$, $t = 1.22$ $p = .226$), nor was the interaction between product categorization and familiarity ($\beta = .02$, $t = .13$, $p = .897$). This suggests that the effects of sustainability claims and product categorization on

purchase intention do not significantly depend on the level of consumer familiarity with HFPs. Therefore, H5 is not supported.

Lastly, to test H6, which stated that more positive attitudes towards hybrid food products would be associated with higher purchase intentions, attitude significantly predicted purchase intention ($\beta = 1.02, t = 11.33, p = <.001, 95\% \text{ CI } (.84, 1.19)$), indicating that participants with more positive attitudes reported higher levels of purchase intention. Therefore, H6 is supported.

As an additional check, the same hypotheses were previously tested using the PROCESS Macro model 5 (Hayes, 2017). Although the main analyses are based on the multiple linear regression, the outcomes of the PROCESS analyses are presented in appendix E. Both analyses yielded comparable results, with no significant effects for the key predictors.

4.4.2. Control variables

In the model with attitude as the dependent variable, several control variables showed statistically significant effects. Subjective norms had a positive and statistically significant effect on attitude ($\beta = .36, t = 4.92, p <.001$), indicating that stronger perceived social norms in favour of HFPs were associated with more positive attitudes. Ethical concerns also positively influences attitude ($\beta = .17, t = 2.48, p = .014$), suggesting that individuals with stronger ethical concerns held more favourable views of hybrid options. Price also had a strong positive effect ($\beta = .25, t = 3.88, p <.001$), indicating that people who were more willing to pay more for HFPs had more positive attitudes. Additionally, familiarity with HFPs was positively associated with attitude ($\beta = .14, t = 2.00, p = .047$), meaning that greater product familiarity predicted more positive attitudes. Although familiarity was not included as a formal predictor of the attitude-related hypotheses, its significant effect suggest that prior exposure to or knowledge of HFPs may play an important role in shaping consumers evaluations. In the model predicting purchase intention as the dependent variable, none of the control variables reached statistical significance, indicating that these factors did not meaningfully contribute to explaining variance in consumers purchase intentions toward HFPs.

Table 4.4.1: Results of Two Regression Models on Attitude and Purchase Intention, with moderator effect of Familiarity

	<i>Attitude</i>	Purchase
		Intention
	<i>b/Beta</i>	b/Beta
Constant		
<i>Control Variables</i>		
Price	.25***	-.03
Subjective norms	.36***	.08
Perceived control	.10	.03
Meat Attachment	-.08	.04
Ethics	.17*	-.10
<i>Main effects</i>		
Sustainability Claim	-.06	-.05
Product Categorization	-.03	-.01
Familiarity	.14*	-.01
Attitude		.73***
<i>Interaction effects</i>		
Claim x Familiarity		.07
Categorization x Familiarity		.03

* p<.05 **p<.01 ***<.001

5. Discussion

This study explored the impact of sustainability claims and product categorization on consumer responses to HFPs, with a specific focus on consumer attitudes and purchase intentions. It also examined whether these effects were influenced by consumers familiarity with HFPs. To investigate this, a 2x2 between subject experiment was conducted using an online survey completed by 171 participants who currently live in the Netherlands.

The findings show that neither sustainability claims nor product categorization significantly influenced purchase intention or attitudes. Consumer familiarity also did not moderate these effects. However, a significant and positive relationship was found between attitude and purchase intention. Notable, some control variables such as price sensitivity, ethical concerns, and subjective norms were more influential in predicting attitudes than the experimental manipulations.

Overall, the findings indicate that sustainability claims and product categorization, although commonly used in food marketing, do not significantly influence consumer attitudes or purchase intentions towards HFPs. Instead, factors such as price sensitivity, ethical concerns, and subjective norms appeared to play a more substantial role in shaping attitudes. This suggest that marketers should look beyond simple messaging strategies and consider the broader psychological and contextual drivers of food choice.

5.1. Theoretical Implications

5.1.1. The limited effectiveness of conventional marketing tactics

This study set out to test whether commonly used marketing strategies, specifically sustainability claims and product categorization, could enhance consumer acceptance of HFPs. However, the results showed no significant effects for either marketing tactic on purchase intention or attitude. Hypothesis 1 and 2 proposed that sustainability claims would positively influence the purchase intention and consumer attitudes of HFPS. However, the quantitative results of this study revealed no significant effect. This suggests that simply including sustainability information did not increase to purchase of HFPs or lead to more positive evaluations. There could be several theoretical explanations for this outcome. First, sustainability claims may be too abstract or not personally relevant, especially for consumers unfamiliar with HFPs. Without clear communication about personal benefits, such as health,

environmental claims alone may be overlooked, as people tend to ignore messages that do not offer a clear personal advantage (Van Dijk et al., 2023, pp.7-8). It is also possible that consumers do not trust or fully understand sustainability labels on HFPs (Grasso & Goksen, 2022, p.6). Since these products are new and somewhat confusing, sustainability might not feel like a believable or important factor. Second, prior research on the “sustainability halo effect” (Smart & Pontes, 2023, pp.1-7) also suggests that this effect is only activated when consumers already perceive the product category as environmentally friendly, something HFPs may not yet achieve due to their ambiguous identity. Lastly, according to Grasso and Goksen (2022, p.6), health concerns often outweigh environmental motivations in consumer decision-making. Moreover, sustainability as a motive may be overshadowed by more concrete drivers such as taste, price or health (Salgaonkar & Nolden, 2024, p.8).

Hypotheses 3 and 4 tested whether product framing, as either meat or vegetarian, would influence consumer attitudes or purchase intentions. Again, no significant effects were found. This showed that whether the product was framed as a meat product or a vegetarian product did not meaningfully influence how willing participants were to purchase them, nor how positively they evaluated the products. These findings diverge from prior literature, which has emphasized the importance of categorization in shaping consumer evaluations and expectations. The non-significant results in this study suggest that categorization, although theoretically relevant, may not strongly influence consumer decisions in the case of HFPs. One explanation could be that HFPs suffer from inherent category ambiguity, making any labelling attempts insufficient to override the confusion. As Salgaonkar and Nolden (2024, pp.8-9) found, consumers may not associate HFPs strongly with either meat or plant-based products, which leads to weak category-based expectations and less impact from categorization cues. From a theoretical standpoint, this challenges assumptions within categorization theory that clear labels alone are sufficient to shape consumer attitudes and behaviour. In the case of HFPs, even a defined category may not resolve the cognitive dissonance consumers experience when faced with conflicting cues. Moreover, if consumers lack strong mental schemes for HFPs, they may rely on holistic processing (evaluating the product as a whole) rather than analytic (specific attributes) evaluation (Morel, 2006, pp. 97-98).

5.1.2. The limited role of consumer familiarity

Contrary to expectations, consumer familiarity did not moderate the relationship between marketing tactics (product categorization and sustainability claims) and purchase intention. This finding does not support earlier research suggesting that familiarity can enhance or shape the effectiveness of marketing cues. According to Moreau et al. (2001, pp.489-490), when consumers are unfamiliar with a product, they rely more heavily on extrinsic cues, such as labels, claims or categorization, to guide their evaluations. Similarly, Salgaonkar and Nolden (2024, pp.8-9) emphasized that unfamiliarity contributes to confusion and weak product perceptions, which can potentially be counteracted by clearer positioning strategies. From a theoretical standpoint, the absence of a moderation effect challenges the assumption that consumer familiarity acts as a boundary condition for information processing. It may suggest that familiarity with HFPs is generally low across the sample, creating little variance in the data. Alternatively, consumers may have relied more on quick judgements based on things like price, packaging or aesthetic factors that were not directly tested in this study. This result may also point to a more general problem of ambiguity in the HFP category. If HFPs lack clear identity and emotional meaning, neither familiarity nor messaging may strongly influence purchase intention. In that case, familiarity alone is not enough to enhance cue effectiveness unless it is accompanied by trust or emotional connection, elements that may need further investigation.

5.1.3. Attitude as a key driver of behavioural intention

Although marketing tactics showed limited direct effects, the study did confirm a strong positive relationship between consumer attitude and purchase intention. This means that the more positively participants evaluated the HFPs, the more likely they were to express willingness to buy them. This outcome is consistent with previous research in consumer behaviour and psychology. The theory of planned behaviour (Ajzen, 1991) clearly identifies attitude as one of the key predictors of behavioural intention. According to this theory, favourable attitudes, formed through positive beliefs about a product, lead to a greater likelihood of action, such as making a purchase. Additionally, this result aligns with Annunziata and Scarpato (2014, p.358) where attitudes significantly influence food choice behaviour and consumer food preferences. When consumers associate HFPs with desirable

qualities (e.g., taste, quality, innovation) their overall evaluation becomes more favourable, translating in higher purchase intentions. This finding also strengthens the interpretation of other results in this study. While external factors such as sustainability claims or product categorization did not directly influence purchase intention, their potential indirect impact through attitude remains theoretically relevant. That is, even if those elements did not work in this case, shaping positive attitudes may still be a promising route for future strategies aiming to increase consumer acceptance of HFPs.

5.2. Practical Implications

This study provides several important insights for practitioners involved in the development, positioning, and promotion of HFPs. While the concept of HFPs presents opportunities for bridging the gap between conventional meat and plant-based alternatives, the findings show that simply adding sustainability claims or relying on categorization is not enough to drive consumer interest or intention. Instead, the most promising strategies involve building customer trust and shaping positive attitudes toward HFPs.

First, the strongest and most consistent result was the significant positive relationship between consumer attitude and purchase intention. This confirms that if consumers feel positively about HFPs, they are more likely to buy them. Marketers should therefore prioritise creating favourable impressions through clear and relatable messaging. Rather than leading with abstract or ethical claims, communication should emphasise sensory benefits (e.g. taste, texture, convenience) and values like enjoyment and modernity. Tactics such as in-store tastings, influencer endorsements such as chefs, nutritionists or influencers to add credibility, or experiential marketing campaigns could help build familiarity and reduce uncertainty.

Second, price sensitivity had a significant positive effect on consumer attitudes towards HFPs. Participants who were more willing to pay for a hybrid product also evaluated it more positively. This suggests that price does not function solely as a barrier but may also serve as an indicator of quality or value. From a marketing perspective, this implies that communicating the added value of HFPs, such as health benefits, nutritional content, or innovation, can enhance attitudes at a higher price point. Marketers should therefore frame price as a reflection of quality or benefit, rather than merely as a cost. Strategies such as

premium positioning, transparency about ingredients, and clearly articulated benefits may help justify the price and reinforce favourable attitudes.

Third, ethical concerns were positively associated with consumer attitudes toward HFPs. This suggests that consumers who are more sensitive to ethical issues, such as environment, transparency and sustainability, tended to evaluate HFPs more favourably. This implies that ethical consumers may be more receptive to the idea of HFPs, provided the product aligns with their values. For marketers and developers, this underscores the importance of highlighting the ethical advantages of HFPs, such as reduced environmental impact or responsible sourcing. Brands can respond to these ethically minded consumers with credible and transparent messaging, using clean-label certifications, ingredient transparency, and minimal processing claims. Additionally, offering behind the scenes content, such as videos of the production process, farmer stories, or sourcing practices, could further foster trust and may strengthen positive attitudes among ethically minded consumers and support long-term brand trust.

Lastly, subjective norms were also a significant predictor of consumer attitudes toward HFPs, indicating that consumers are more likely to hold positive evaluations of HFPs when they feel others in their social environment would support or expect that behaviour. For marketers, this suggests that social influence can be leveraged to shape favourable attitudes. Campaigns that include user-generated content, testimonials, or real-life stories can help reinforce the idea that HFPs are becoming a socially accepted and normalised choice. Endorsements by well-known influencers, chefs, or nutritionists may also increase legitimacy and reduce perceived social risk. Additionally, marketers can highlight social benefits of HFPs, such as being part of a movement towards sustainable eating or showing consideration to the planet. Messaging that connects personal choices to broader social trends can make consumers feel supported in trying something new.

5.3. Limitations and Suggestions for Further Research

Although this study provides valuable insights into consumer behaviour toward HFPs, several limitations must be considered when interpreting the results. First, the study used a fictitious product and experimental design, which, while useful for controlling variables, may limit the generalizability of the results. Participants were not making real purchase decisions

with actual money or personal consequences. As such, their intentions might differ in real-world setting where price, packing, brand, and social dynamics play a larger role.

Additionally, because the product was presented through text and imagery only, participants were not able to engage with the product in a sensory or emotional way. This absence of multisensory interaction (no tasting, touching, or smelling) may have reduced their ability to form realistic impressions, which is particularly relevant for food products (Velasco et al., 2013, p.9). Future research could replicate the study in a field setting or through actual product testing, incorporating multisensory experiences to better reflect real consumer behaviour and to increase validity.

Second, the sample mainly consisted of young, highly educated individuals, typically a demographic associated with openness to innovation and sustainability. Interestingly, even within this group, sustainability claims did not significantly affect attitudes or purchase intention. This suggests the lack of impact may be even more pronounced in the general population, where openness to sustainability may be even lower. Future research should include a more diverse and representative sample to examine whether these results hold across different demographic groups, or whether other motivations (e.g., health, taste, convenience etc.) become more prominent.

Third, the independent variables, sustainability claim and product categorization, did not show significant effects. While this provides interesting theoretical implications, it may also be due to low familiarity or weak manipulation strength. Participants may not have fully understood, read, or internalized the product categorization or sustainability claim presented in the stimuli. Additionally, since the study was conducted in an online environment, there was limited control over how much attention participants paid to the stimuli. It is possible that the visual and textual cues were overlooked or quickly skimmed, reducing their intended impact. Future research could explore the role of message clarity, claim format and visual packaging cues in a more controlled setting, such as in person experiments or eye-tracking studies (Pieters & Wedel, 2004, pp. 36-38), to determine more effective ways of delivering these marketing signals.

Finally, the study focused on attitude and purchase intention, but not on actual behaviour or long-term adoption. While intentions are a good predictor of behaviour, they do not always translate into real-life actions. Future research could explore longitudinal designs or actual purchase data (Caruana et al., 2015, pp.537-539), such as tracking

supermarket behaviour or using digital test markets. In addition to addressing these limitations, future research could also explore adjacent areas, such as how emotions, social identity, or branding strategies (Elhoushy & Jang, 2023, pp. 2187 – 2191) influence the acceptance of HFPs. As HFPs become more visible in the market, understanding these broader psychological and cultural dynamics will be essential for both academic theory and industry practices.

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Appendices

Appendix A: Questionnaire

Dear respondent,

Thank you for your interest. We kindly ask you to fill in the questionnaire. In the following section, you will be shown a product description for a new food product. Afterwards, you will be asked a few questions about your opinion of the product and your intentions to purchase it. The questionnaire will take around **5 minutes** to complete. We ask you to answer carefully and honestly, as your opinion is valuable for this study. There are no right or wrong answers.

CONFIDENTIALITY AND VOLUNTARY

All data will remain strictly confidential and anonymous. We will not be able to identify you personally. There are no foreseeable risks or discomforts involved in participating in this research. Your participation is entirely voluntary. You are free to decline or discontinue your participation at any time without any consequences and without having to provide a reason. By continuing with this survey, you are providing your informed consent to participate.

FURTHER INFORMATION

If you have any questions about the study before or after your participation, feel free to contact the responsible researcher: Elisa Prince, email: 695521ep@eur.nl. This study has been approved by the Ethics Committee of Erasmus University Rotterdam. For questions concerning your privacy or to invoke your rights, you may contact Erasmus University's Data Protection Officer (DPO) at fg@eur.nl.

If you understand the information above and freely consent to participate in this study, click the "Yes, I consent" button below to begin the questionnaire.

- 1) Yes, I consent
- 2) No, I do not consent

On the next page, you will be shown an advertisement for a new food product. After viewing the advertisement, you will be asked a few questions about the product. Please look at the advertisement carefully.

1. Please indicate how much you agree or disagree with the following statements about the advertisement of the hybrid burger you just saw

	Strongly Disagree	Somewhat Disagree	Neither agree nor disagree	Somewhat Agree	Strongly Agree
There is a fairly good possibility that I will buy this hybrid burger					
I would like to recommend the hybrid burger to my friends					
It is likely that I will buy the hybrid burger in the next 12 months					
It is likely that I will shop for hybrid burgers when I buy burgers in the upcoming year					
I would consider buying hybrid burgers					

2. Please indicate how much you agree or disagree with the following statements about the advertisement of the hybrid burger you just saw

	Strongly Disagree	Somewhat Disagree	Neither agree nor disagree	Somewhat Agree	Strongly Agree
In general , I have a good feeling towards hybrid burgers					
I feel enthusiastic about eating hybrid burgers					
I like the appearance of hybrid burgers					
I like the way hybrid burgers are prepared					

3. Please indicate how much you agree or disagree with the following statements about hybrid burgers

	Strongly Disagree	Somewhat Disagree	Neither agree nor disagree	Somewhat Agree	Strongly Agree
I think that hybrid burgers have good flavour					
I think that the texture of the hybrid burger is pleasant					
I think that hybrid burgers are healthy					
I think that hybrid burgers are nutritious					

4. Please indicate how much you agree or disagree with the following statements about new food products

	Strongly Disagree	Somewhat Disagree	Neither agree nor disagree	Somewhat Agree	Strongly Agree
I am afraid to eat things I have never had before					
I do not trust new foods					
I will eat almost anything					
I am very particular about the foods I eat					

5. Indicate how much you would be willing to pay for a hybrid burger (only for the burger, so without the bun and toppings)

6. Please indicate how much you agree or disagree with the following statements about hybrid food products in general

	Strongly Disagree	Somewhat Disagree	Neither agree nor disagree	Somewhat Agree	Strongly Agree
I am quite familiar with hybrid food products					
I know a lot about hybrid food products					
I consider myself to be an experienced hybrid food product consumer					
Hybrid food products are very important to me					
With hybrid food product I buy matters to me a lot					

7. Please indicate how much you agree or disagree with the following statements about hybrid food products in general

	Strongly Disagree	Somewhat Disagree	Neither agree nor disagree	Somewhat Agree	Strongly Agree
Most people who are important to me approve of eating hybrid food products					
Most people like me eat hybrid food products					
It is expected of me that I eat more hybrid food products					
Purchasing hybrid food products can enhance my social reputation					

8. Please indicate how much you agree or disagree with the following statements about hybrid food products in general

	Strongly Disagree	Somewhat Disagree	Neither agree nor disagree	Somewhat Agree	Strongly Agree
Eating more hybrid food products is up to me					
If I wanted to, it would be possible to eat more hybrid food products					
Buying hybrid food products is easy					

9. Please indicate how much you agree or disagree with the following statements about meat consumption

	Strongly Disagree	Somewhat Disagree	Neither agree nor disagree	Somewhat Agree	Strongly Agree
I love meals with meat					
I'm a big fan of meat					
I don't picture myself without eating meat regularly					
I would be fine with a meatless diet					
To eat meat is disrespectful towards life and the environment					
By eating meat I'm reminded of the death and suffering of animals					

10. Please indicate how much you agree or disagree with the following statements about ethics

	Strongly Disagree	Somewhat Disagree	Neither agree nor disagree	Somewhat Agree	Strongly Agree
I regularly show that I care about ethics and values while choosing food products					
Being consistently ethical while choosing food products helps the environment					
Ethical concerns are integrated into everyday decision making, including choosing new food products					

11. Did the advertisement include a sustainability claim?

- Yes
- No
- Not sure

12. How was the hybrid burger categorized?

- Beef burger
- Vegetarian burger
- Not sure

13. What is your age in years?

14. What is your gender?

- Male
- Female
- Non-Binary / Third gender
- Prefer not to say

15. Are you currently living in the Netherlands?

- Yes
- No
- Prefer not to say

16. Which country are you from?

17. What is the highest level of school you have completed or the highest degree you have received?

- Less than high school (no degree)
- High school diploma or equivalent
- Bachelor's degree or equivalent
- Master's degree or equivalent
- Doctoral degree or equivalent

Thank you for participating!

This study aimed to investigate how different marketing tactics influence consumer responses to hybrid food products (HFPs). The advertisements and products you saw were completely fictional. They were designed to reflect real-world advertisements and test how people perceive different marketing tactics.

If you have any question about the study or would like to withdraw your responses, please contact Elisa Prince: 695521ep@eur.nl

Your responses remain completely anonymous and confidential.

Thank you again for your time!

We thank you for your time spent taking this survey.

Your response has been recorded. If you have any questions, please contact the researcher:
Elisa Prince (695521ep@eur.nl)

Appendix B: Stimuli

Beef burger without Sustainability claim:

BURGER

HYBRID **BEEF** BURGER

50% BEEF, 50% PLANT-BASED



Our Hybrid **Beef** Burger combines the rich taste of beef with the nutritional benefits of plant-based ingredients. Made with 50% real beef and 50% vegetables and grains.

This burger offers a balanced blend of **flavours, providing a satisfying meal option for those looking for a **tasteful** and **nutritious** choice.**

Beef burger with Sustainability claim:

BURGER

HYBRID BEEF BURGER

50% BEEF, 50% PLANT-BASED



Our Hybrid **Beef** Burger combines the rich taste of beef with the nutritional benefits of plant-based ingredients. Made with 50% real beef and 50% vegetables and grains.

This product helps reduce carbon emissions and supports a more sustainable food system by using 50% plant based ingredients.

Vegetarian burger without sustainability claim:

BURGER

HYBRID **VEGETARIAN** BURGER

50% PLANT-BASED, 50% BEEF



Our Hybrid **Vegetarian** Burger combines the rich taste of plant-based ingredients with the nutritional benefits of beef. Made with 50% vegetables and grains and 50% real beef.

This burger offers a balanced blend of **flavours, providing a satisfying meal option for those looking for a **tasteful** and **nutritious** choice.**

Vegetarian burger with sustainability claim:

BURGER

HYBRID **VEGETARIAN** BURGER

50% PLANT-BASED, 50% BEEF



Our Hybrid **Vegetarian** Burger combines the rich taste of plant-based ingredients with the nutritional benefits of beef. Made with 50% vegetables and grains and 50% real beef.

This product helps reduce carbon emissions and supports a more sustainable food system by using 50% plant based ingredients.

Appendix C: Overview of Measurement Items and Adaptions

Construct	Source	Original Item	Adapted Item
Purchase Intention	Seymour et al. (1994)	There is a fairly good possibility that I will buy five tubes of toothpaste	There is a fairly good possibility that I will buy this hybrid burger
Purchase Intention	Moon et al. (2008)	I would like to recommend the computer desk/sunglasses to my friends.	I would like to recommend the hybrid burger to my friends
Purchase Intention	(Kim & Lennon (2000)	How likely is it that you will buy the apparel item you viewed today in the next 12 months?	It is likely that I will buy the hybrid burger in the next 12 months
Purchase Intention	Kim & Lennon (2000)	How likely is it that you will shop for apparel via television shopping when you buy apparel in the upcoming year?	It is likely that I will shop for hybrid burgers when I buy burgers in the upcoming year
Purchase Intention	Diallo (2012)	I would consider buying SBs	I would consider buying hybrid burgers
Attitude	Russel and Hollander (1975).	In general, I have a good feeling towards biology	In general, I have a good feeling towards hybrid burgers
Attitude	Asperin et al. (2025)	I feel enthusiastic about eating this type of food	I feel enthusiastic about eating hybrid burgers
Attitude	Asperin et al. (2025)	I like the appearance of this type of food	I like the appearance of hybrid burgers
Attitude	Asperin et al. (2025)	I like the way this food is prepared	I like the way hybrid burgers are prepared
Attitude	Asperin et al. (2025)	This type of food has good flavor	I think that hybrid burgers have good flavour
Attitude	Asperin et al. (2025)	The texture of this food is pleasant	I think that the texture of hybrid burgers is pleasant
Attitude	Asperin et al. (2025)	Thai food is healthy	I think that hybrid burgers are healthy
Attitude	Asperin et al. (2025)	Thai food is nutritious	I think that hybrid burgers are nutritious
Attitude	Asperin et al. (2025)	I am afraid to eat things I have never had before	I am afraid to eat things I have never had before
Attitude	Asperin et al. (2025)	I don't trust new foods	I do not trust new foods
Attitude	Asperin et al. (2025)	I will eat almost anything	I will eat almost anything
Attitude	Asperin et al. (2025)	I am very particular about the foods I will eat	I am very particular about the foods I will eat
Familiarity	Casaló et al. (2007)	I am quite familiar with this website	I am quite familiar with hybrid food products
Familiarity	Söderlund (2002)	I know a lot about the range of restaurants in the town where I live	I know a lot about hybrid food products
Familiarity	Söderlund (2002)	I consider myself to be an experienced restaurant guest	I consider myself to be an experienced hybrid food product consumer
Familiarity	Mittal (1995)	Facial tissues are very important to me	Hybrid food products are very important to me
Familiarity	Mittal (1995)	Which facial tissues I buy matters to me a lot	Which hybrid food product I buy matters to me a lot
Subjective norms	Ajzen (2006)	Most people who are important to me approve of my exercising for at least 20	Most people who are important to me approve of eating hybrid products

		minutes, three times per week for the next three months.	
Subjective norms	Ajzen (2006)	Most people like me exercised for at least 20 minutes, three times per week in the three months following their major surgery	Most people like me eat hybrid food products
Subjective norms	Ajzen (2002)	It is expected of me that I walk on a treadmill for at least 30 minutes each day in the forthcoming month	It is expected of me that I eat more hybrid food products
Subjective norms	Qi (2021)	Purchasing green food can make me gain face	Purchasing hybrid food products can enhance my social reputation
Behavioural control	Ajzen (2006)	My exercising for at least 20 minutes, three times per week for the next three months is up to me	Eating more hybrid food products is up to me
Behavioural control	Kumar and Smith (2017)	If I wanted to, it would be possible for me to buy local food instead of conventional food	If I wanted to, it would be possible to eat hybrid food products
Behavioural control	Kumar and Smith (2017)	For me buying, local food is easy	Buying hybrid food products is easy
Meat attachment	Kühn et al. (2023).	I love meals with meat	I love meals with meat
Meat attachment	Kühn et al. (2023).	I'm a big fan of meat	I'm a big fan of meat
Meat attachment	Kühn et al. (2023).	I don't picture myself without eating meat regularly	I don't picture myself without eating meat regularly
Meat attachment	Kühn et al. (2023).	I would be fine with a meatless diet	I would be fine with a meatless diet
Meat attachment	Kühn et al. (2023).	To eat meat is disrespectful towards life and the environment	To eat meat is disrespectful towards life and the environment
Meat attachment	Kühn et al. (2023).	By eating meat I'm reminded of the death and suffering of animals	By eating meat I'm reminded of the death and suffering of animals
Ethical concerns	Treviño et al. (2007)	Executives of this organization regularly show that they care about ethics and values	I regularly show that I care about ethics and values while choosing food products
Ethical concerns	Treviño et al. (2007)	Being consistently ethical helps an employee to advance in this firm	Being consistently ethical while choosing food products helps the environment
Ethical concerns	Treviño et al. (2007)	Ethics and values concerns are integrated into everyday decision making in this organization	Ethical concerns are integrated into everyday decision making, including choosing new food products

Appendix D: Factor Analysis

Appendix C1. Factor analyses for Purchase Intention (P), Attitude (A), Consumer Familiarity (CF), Norms (N), Control (C), Meat Attachment (M), and Ethics (E).

Items	P	A	CF	N	C	M	E
There is a fairly good possibility that I will buy this hybrid burger	.924						
I would like to recommend the hybrid burger to my friends	.812						
It is likely that I will buy the hybrid burger in the next 12 months	.926						
It is likely that I will shop for hybrid burgers when I buy hybrid burgers in the upcoming year	.905						
I would consider buying hybrid burgers	.908						
In general, I have a good feeling towards hybrid burgers		.823					
I feel enthusiastic about eating hybrid burgers		.810					
I like the appearance of hybrid burgers		.730					
I like the way hybrid burgers are prepared		.809					
I think that hybrid burgers have good flavour		.677					
I think that hybrid burgers are healthy		.704					
I think hybrid burgers are nutritious		.720					
I am quite familiar with hybrid food products			.887				
I know a lot about hybrid food products			.909				
I consider myself to be an experienced hybrid food product consumer			.884				
Hybrid food products are very important to me			.640				
Most people who are important to me approve of eating hybrid food products				.717			
Most people like me eat hybrid food products				.816			
It is expected of me that I eat more hybrid food products				.722			
Purchasing hybrid food products can enhance my social reputation				.769			

Eating more hybrid food products is up to me								.751
If I wanted to, it would be possible to eat more hybrid food products								.872
Buying hybrid food products is easy								.666
I love meals with meat								.842
I'm a big fan of meat								.864
I don't picture myself without eating meat regularly								.781
I would be fine with a meatless diet								.813
To eat meat is disrespectful towards life and environment								.744
By eating meat I'm reminded of the death and suffering of animals								.720
I regularly show that I care about ethics and values while choosing food products								.911
Being consistently ethical while choosing food products helps the environment								.934
Ethical concerns are integrated into everyday life decision making, including choosing new food products								.939
Eigenvalue	4.012	4.590	2.804	2.291	1.768	3.798	2.585	
Cronbach's alpha	.938	.892	.849	.748	.648	.882	.919	

Appendix E: PROCESS Macro Hayes (model 5) analyses

Note: The PROCESS Macro by Hayes was not used for testing H5, as the hypothesized interaction involved two independent variables (sustainability claim and product categorization) and their moderation by familiarity within the same model. Since process does not support testing multiple independent variables with separate interaction term simultaneously, this hypothesis was tested exclusively through a custom multiple regression model in SPSS.

Sustainability claim and Attitude on purchase intention (H1 and H6)

Appendix G1: Results of Moderated Regression Model with Sustainability Claim as Independent Variable on Purchase Intention

	<i>b</i>	SE	<i>t</i>	<i>p</i>	CI (lower)	CI (upper)
Constant	-.102	.479	-.214	.8312	-1.048	.8437
Sustainability Claim (X)	-.359	.288	-1.244	.2154	-.929	.221
Attitude (M)	1.014	.092	11.062	.0000***	.833	1.195
Familiarity (W)	.006	.100	.066	.9475	-.190	.203
Claim x Familiarity	.138	.134	1.030	.3044	-.126	.401
Price	-.026	.040	-.655	.5134	-.104	.052
Norms	.141	.097	1.446	.1503	-.052	.332
Control	.031	.075	.409	.6829	-.118	.179
Meat Attachment	.033	.0700	.477	.6343	-.105	.171
Ethics	-.192	.089	-2.163	.0321*	-.367	-.017
Product Categorization	.024	.125	.189	.8506	-.224	.271

* $p < .05$ ** $p < .01$ *** $p < .001$

Sustainability claim on attitude (H2)

Appendix G2: Results of Moderated Regression Model with Sustainability Claim as Independent Variable on Attitude

	<i>b</i>	SE	<i>t</i>	<i>p</i>	CI (lower)	CI (upper)
Constant	.547	.409	1.3382	.1828	-.260	1.3541
Sustainability Claim (X)	-.066	.109	-.605	.5459	-.282	.149
Price	.112	.033	3.380	.0009	.047	.178
Norms	.4326	.073	5.935	.0000	.289	.577
Control	.116	.065	1.770	.0787	-.013	.244
Meat Attachment	.079	.061	1.302	.1949	-.041	.200
Ethics	.181	.076	2.364	.0193	.030	.331
Product Categorization	-.056	.110	-.5114	.6098	-.274	.161

* $p < .05$ ** $p < .01$ *** $p < .001$

Product categorization on purchase intention (H3)

Appendix G3: Results of Moderated Regression Model with Product Categorization as Independent Variable on Purchase Intention

	<i>b</i>	SE	<i>t</i>	<i>p</i>	CI (lower)	CI (upper)
Constant	-.172	.479	-.358	.7207	-1.117	.774
Product Categorization (X)	-.077	.294	-.261	.7944	-.658	.504
Attitude (M)	1.022	.092	11.157	.0000***	.841	1.203
Familiarity (W)	.047	.099	.480	.6323	-.148	.243
Product x Familiarity	.054	.136	1.392	.6953	-.216	.323
Price	-.029	.040	-.718	.4741	-.107	.050
Norms	.140	.098	1.438	.1524	-.052	.333
Control	.032	.076	.417	.6773	-.118	.182
Meat Attachment	.027	.070	.382	.7031	-.111	.165
Ethics	-.194	.089	-2.177	.0310*	-.370	-.018
Sustainability Claim	-.092	.125	-.736	.4632	-.337	.154

* $p < .05$ ** $p < .01$ *** $p < .001$

Product categorization on attitude (H4)

Appendix G4: Results of Moderated Regression Model with Product Categorization as Independent Variable on Attitude

	<i>b</i>	SE	<i>t</i>	<i>p</i>	CI (lower)	CI (upper)
Constant	.547	.409	1.3382	.1828	-.260	1.3541
Product Categorization (X)	-.056	.110	-.511	.6098	-.274	.161
Price	.112	.033	3.380	.0009	.047	.178
Norms	.4326	.073	5.935	.0000	.289	.577
Control	.116	.065	1.770	.0787	-.013	.244
Meat Attachment	.079	.061	1.302	.1949	-.041	.200
Ethics	.181	.076	2.364	.0193	.030	.331
Sustainability Claim	-.066	.109	-.605	.5459	-.282	.149

* $p < .05$ ** $p < .01$ *** $p < .001$

Appendix F: Declaration Page: Use of Generative AI Tools in Thesis

Student Information

Name: Elisa Prince

Student ID: 695521

Course Name: Master Thesis CM5000

Supervisor Name: Dr. S.A. Rijsdijk

Date: 26-06-2025

Declaration:

Acknowledgment of Generative AI Tools

I acknowledge that I am aware of the existence and functionality of generative artificial intelligence (AI) tools, which are capable of producing content such as text, images, and other creative works autonomously.

GenAI use would include, but not limited to:

- Generated content (e.g., ChatGPT, Quillbot) limited strictly to content that is not assessed (e.g., thesis title).
- ~~Writing improvements, including~~ grammar and spelling corrections (e.g., Grammarly)
- Language translation (e.g., DeepL), without generative AI alterations/improvements.
- Research task assistance (e.g., finding survey scales, qualitative coding verification, debugging code)
- Using GenAI as a search engine tool to find academic articles or books (e.g.,

I declare that I have used generative AI tools, specifically [Name of the AI Tool(s) or Framework(s) Used], in the process of creating parts or components of my thesis. The purpose of using these tools was to aid in generating content or assisting with specific aspects of thesis work.

I declare that I have NOT used any generative AI tools and that the assignment concerned is my original work.

Signature: [digital signature]

Date of Signature: [Date of Submission]

Extent of AI Usage

I confirm that while I utilized generative AI tools to aid in content creation, the majority of the intellectual effort, creative input, and decision-making involved in completing the thesis were undertaken by me. I have enclosed the prompts/logging of the GenAI tool use in an appendix.

Ethical and Academic Integrity

I understand the ethical implications and academic integrity concerns related to the use of AI tools in coursework. I assure that the AI-generated content was used responsibly, and any content derived from these tools has been appropriately cited and attributed according to the guidelines provided by the instructor and the course. I have taken necessary steps to distinguish between my original work and the AI-generated contributions. Any direct quotations, paraphrased content, or other forms of AI-generated material have been properly referenced in accordance with academic conventions.

By signing this declaration, I affirm that this declaration is accurate and truthful. I take full responsibility for the integrity of my assignment and am prepared to discuss and explain the role of generative AI tools in my creative process if required by the instructor or the Examination Board. I further affirm that I have used generative AI tools in accordance with ethical standards and academic integrity expectations.

Signature: Elisa Prince

Date of Signature: 26-06-2025

Appendix G: Prompts of ChatGPT

In accordance with university guidelines, the use of generative AI (ChatGPT) in this thesis was limited to permitted supplementary tasks, including idea generation, wording suggestions, and basic language support. Below is an overview of how AI was used.

1. Idea generation

I gave ChatGPT the following prompt: “What could be a good framework for predicting consumer behaviour?”. ChatGPT came with the following prompt:

“A suitable framework for predicting consumer behavior depends on the specific factors being analyzed. Three well-established models that align with this research on hybrid food product adoption include:

- * Theory of Planned Behavior (TPB) (Ajzen, 1991) – Explains how attitudes, subjective norms, and perceived behavioral control influence purchase intentions. This model is particularly relevant for understanding how sustainability claims, pricing, and familiarity shape consumer decisions.

- * Consumer Decision-Making Process Model (Kotler & Keller, 2016) – Outlines five key stages in consumer purchases: problem recognition, information search, evaluation of alternatives, purchase decision, and post-purchase behavior. This model is useful for identifying barriers and marketing influences at each stage.

- * Fogg Behavior Model (Fogg, 2009) – Proposes that behavior occurs when motivation, ability, and triggers align. It explains how pricing, sustainability claims, and marketing messages act as triggers for consumer adoption.

Each of these models provides a unique perspective on consumer behavior, offering valuable insights into how hybrid food products can be effectively marketed and positioned for adoption. (OpenAI, 2023).

After the answer of ChatGPT I started my search for interesting academic articles that could support the suggestions of ChatGPT. In which I did find interesting articles which made an interesting framework for this paper.

2. Suggesting keywords (Synonym search)

Prompt: "What is a synonym for shape?"

- Influence
- Affect
- Determine
- Drive
- Guide
- Form
- Steer
- Define
- Mold

(OpenAI, 2023).

After these synonyms I changed some of the words "shape" into the words "affect" and "define".

Another prompt is: "Can you find a variant of "we hypothesize" so that I do not say the same thing the whole time?" Answer:

- We propose that...
- It is assumed that...
- This study anticipates that....
- It is expected that....
- This leads to the following hypothesis....

(OpenAI, 2023).

The last prompt was: "can you give me synonyms for the word "product"?" Answer:

- Item
- Offering
- Good
- Solution
- Alternative

- Option
- Food innovation
- Concept

(OpenAI, 2023).

3. Grammar and spell check

Prompt: “Can you rewrite this more professionally: “To overcome these barriers, marketers often rely on tactics to support successful market placement”?. Chat gave me the following answer:

“To address these challenges, marketers often apply strategies positioning techniques to enhance market entry success (OpenAI, 2023).

Prompt: “Moreover, if consumers lack strong mental schemes for HFPs, they may rely on holistic processing rather than analytical, attribute-based evaluation (Morel, 2006). Can you make this sentence easier to follow and in correct English? Answer:

“If consumers lack clear mental categories for HFPs, they are more likely to evaluate them as a whole rather than by individual features” (OpenAI, 2023).

Prompt: Correct this sentence on grammar and spelling: “This ambiguity complicates effective product positioning and marketing communication, and could therefore be a result of sales performance not having met retailer expectations in a highly dynamic market environment.” Answer:

“The sentence is grammatically understandable, but somewhat unclear and illogical in terms of content and style. Here’s an improved version: This ambiguity complicates effective product positioning and marketing communication, which may in turn contribute to disappointing sales performance and unmet retailer expectations in a highly dynamic market environment (OpenAI, 2023).

Prompt: “This consumer confusion could potentially hinder HFPs adoption since these products are neither fully meat nor entirely plant based. Their ambiguous categorization makes it difficult for consumers to form clear expectations about taste, health benefits, or

ethical implications (Salgaonkar & Nolden, 2024, p.8). Can you help me make these sentences more cohesive? Answer:

“This consumer confusion may hinder the adoption of HFPs, as these products are neither fully meat nor entirely plant-based. Their ambiguous classification makes it challenging for consumers to form clear expectations regarding taste, health benefits, or ethical considerations (Salgaonkar & Nolden, 2024, p.8).” (OpenAI, 2023).