

Branding strategies for controversial products: the role of ingredient co-branding and brand positioning

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Abstract

Purpose – This study aims to investigate the most effective branding strategy for facilitating the acceptance of controversial products. Three strategies were compared: host brand alone, ingredient brand alone and ingredient co-branding. The study also examined which brand positioning – warm, competent or ideological – would best suit an ingredient brand wanting to partner with a host brand.

Design/methodology/approach – An experiment was conducted on 70 consumers using a survey and an eye tracker. The survey measured curiosity, purchase intention and brand fit, while the eye tracker recorded fixation duration (interest), revisits (semantic informativeness) and peak velocity of saccades (arousal).

Findings – The results indicated that host brand alone and ingredient co-branding elicited greater curiosity and intention to purchase than ingredient brand alone, with ingredient co-branding also exerting a significant impact on semantic informativeness and arousal. Furthermore, consumers perceived a warmly positioned ingredient brand as most compatible with the host brand.

Originality/value – This study extends the literature on ingredient co-branding by examining it in the context of controversial products. In doing so, it reveals the efficacy of an ingredient co-branding strategy and informs brand hosts to select partners with a warm brand positioning.

Keywords Branding, Co-branding, Ingredient co-branding, Controversial products, Consumer behaviour, Consumer neuroscience, Eye tracking

Paper type Research paper

1. Introduction

Marketing research has consistently shown that brand strength shapes consumers' willingness to adopt new products (Kumar *et al.*, 2026). To overcome entry barriers and secure market legitimacy, emerging or lesser-known brands often establish co-branding alliances with established counterparts (Kim and Voss, 2025; Tavassoli *et al.*, 2025). Co-branding is a long-term collaboration through which partnering brands integrate tangible and intangible assets to develop a new offering (Besharat and Langan, 2014; Park *et al.*, 1996), often resulting in product can create enhanced customer value (Meng *et al.*, 2026; Steffl *et al.*, 2024; Washburn *et al.*, 2000). The ability to generate these benefits (Besharat and Langan, 2014; Washburn *et al.*, 2000) explain its diffusion across sectors such as automotive, fashion, financial services and food.

Among co-branding strategies (Blackett and Russell, 1999; Leuthesser *et al.*, 2003; Newmeyer *et al.*, 2018; Ottoni *et al.*, 2025), ingredient co-branding, i.e. the inclusion of a branded ingredient within a host brand's product to achieve superior market outcomes

(Desai and Keller, 2002; Kotler and Pfoertsch, 2010), is the most prevalent (Pinello *et al.*, 2022). Ingredient co-branding differs from generic co-branding by embedding one brand's core attributes within another, making the final offering inseparable from its components. Co-branding involves a long-term interbrand partnership to introduce a joint product marketed under both names. Dual branding, common in food retail, co-locates multiple branded entities within a shared space to reduce costs and expand consumer choice (Besharat and Langan, 2014).

Popularised by initiatives such as 'Intel Inside', ingredient co-branding has gained traction in the food industry (Ponnam and Balaji, 2015). As consumers increasingly seek natural, organic and sustainable ingredients (National Sanitation Foundation, 2025), innovative firms develop novel components, such as sweeteners, starches and fibres, and partner with large manufacturers to access

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mass markets, as illustrated by partnerships such as [Cargill \(2024\)](#) and ENOUGH. In such partnerships, the ingredient brand enhances or differentiates the host brand's positioning, leading to greater legitimacy in its entry into novel categories ([Kotler and Pfoertsch, 2010](#)).

Ingredient co-branding is also emerging as a suitable strategy to allow incumbent brands to access controversial product categories, that is, categories that are "negatively stereotyped and collectively devalued by one or more stakeholder audiences in ways that discredit the market as a whole" ([Slade Shantz et al., 2018](#), p. 1261). These include alcohol, tobacco, gambling ([Waller et al., 2005](#)), cannabis-infused foods ([Huff et al., 2021](#)) and insect-based food ([Valesi et al., 2024](#)). For example, Coca-Cola has entered the alcoholic beverage market through co-branding partnerships ([Doering, 2024](#)). To the authors' knowledge, no prior research has examined the outcomes of ingredient co-branding in controversial product categories, despite its growing business relevance and academic interest ([Doering, 2024](#); [Srivastava et al., 2024](#)).

Entering controversial categories may expose host brands to risks, because associations linked to controversial ingredients can damage brand perceptions. Controversial products may induce psychological distress among consumers ([Major and O'Brien, 2005](#)), generating anxiety, embarrassment and shame throughout the consumption cycle ([Dahl et al., 2001](#); [Bailey and Waronska, 2015](#)). Co-branding may therefore offer reciprocal benefits: host brands can exploit commercially promising yet contested categories, whereas controversial brands can leverage the host's credibility to gain legitimacy ([Grougiou et al., 2016](#)). However, whether ingredient co-branding is effective in such settings remains unclear ([Zhang et al., 2025](#)).

To address this gap, the present study asks two research questions:

- RQ1.* Should a host brand entering a novel, contested category do so independently or through ingredient co-branding?
- RQ2.* If co-branding is adopted, what positioning should the controversial ingredient brand assume to be perceived as a suitable partner?

To provide answers to these questions, the study focused on the edible insect market as a compelling example of a controversial category.

Despite their nutritional ([Acosta-Estrada et al., 2021](#)) and environmental benefits ([Vauterin et al., 2021](#)), edible insects face persistent psychological barriers, including disgust ([Lorenz et al., 2014](#)), food neophobia ([Sogari et al., 2019](#)) and health concerns ([Palmieri et al., 2019](#)). Even so, the market is expected to expand from US\$3.2bn to US\$17.6bn by 2032 ([Statista, 2022](#)), while the International Platform of Insects for Food and Feed projects an increase in consumers from 9 million in 2019 to 390 million by 2030 ([IPIFF, 2020](#)). Major firms, including Nestlé Purina (2020) and Carrefour (2018), have already launched insect-based initiatives, signalling commercial momentum and broader relevance ([van Huis et al., 2013](#); [Lange and Nakamura, 2023](#)). Academic interest has likewise grown substantially, with research on edible-insect ingredients expanding rapidly through 2024 and deepening

understanding of the factors shaping consumer responses ([Schomaker and Fiebelkorn, 2026](#)).

In light of the relevance of insect-based foods as a paradigmatic controversial market, and consistent with this study's research questions, two main objectives were pursued:

- 1 to assess the most effective branding strategy for entering a controversial product category (host brand alone, ingredient brand alone or ingredient co-branding) (objective 1); and
- 2 to examine whether, within co-branding, the ingredient brand's positioning (warm, competent or ideological) influences its suitability (objective 2).

As with other controversial products ([Huff et al., 2021](#)), edible-insect brands often adopt emotional, rational or ideological cues to legitimise themselves and attract sceptical consumers ([Valesi et al., 2024](#)).

To achieve these aims, the study adopts a multi-method experimental design integrating traditional and neuroscientific techniques. In a marketplace saturated with marketing stimuli, capturing consumer attention is critical ([Ha and McCann, 2008](#)), as the attention devoted to a stimulus influences its inclusion in the mental consideration set and, ultimately, consumer choice ([Pieters and Warlop, 1999](#)). Because consumers typically spend less than 20 s evaluating products ([Chandon et al., 2009](#)), much of the decision process occurs at a subconscious level ([Dijksterhuis, 2004](#)), making neuroscience a valuable approach for investigating consumer behaviour ([Casado-Aranda et al., 2023](#)). The paper structure proceeds with a literature review on ingredient co-branding followed by the theoretical framework and an explanation of the methodology. The empirical findings are then presented. The paper concludes with a discussion of implications, limitations and directions for future research.

2. Literature review

The growing prevalence of co-branding in business practice has spurred scholarly efforts to define its nature and forms ([Pinello et al., 2022](#)). To the best of the authors' knowledge, there are four main taxonomies of co-branding that illuminate its manifold forms. One distinguishes between different forms of co-branding based on the level of involvement of the participants ([Blackett and Russell, 1999](#)). Another ([Leuthesser et al., 2003](#)) identifies four distinct co-branding strategies based on participating brands' market power and their product complementarities. A subsequent classification focuses on the integration of partnering brands required by different forms of co-branding ([Newmeyer et al., 2018](#)). A more recent taxonomy ([Ottoni et al., 2025](#)) classifies co-branding based on the complexity, level of integration and added value of the brands involved. All these taxonomies include ingredient co-branding, which is the most widely studied form in the current literature ([Xu et al., 2023](#)).

Ingredient co-branding has gained traction due to firms' increasing reliance on specialised resources to maintain competitiveness ([Pinello et al., 2022](#)). Interest in ingredient co-branding results from its benefits for both host and ingredient brands. Cooperation fosters trust, shared capabilities and risk distribution. It can act as a market entry barrier to new market entrants, enhance brand reputation and generate financial advantages. Suppliers may offer favourable pricing to loyal manufacturers, while both parties benefit from economies of scale and reduced costs through the elimination of double

marginalisation. Supplier-funded advertising can also amplify promotional efforts and generate cost savings, making the market position stronger (Erevelles *et al.*, 2008).

Notwithstanding its advantages, ingredient co-branding also entails risks. A key concern is the imbalance in brand equity between host and ingredient brands (Radighieri *et al.*, 2014; Swaminathan *et al.*, 2012). When the brand strength of the partnering brands is uneven, outcomes may be unpredictable in ingredient co-branding contexts (Tang *et al.*, 2025). A failed collaboration can disproportionately damage the stronger brand, typically the host, while the weaker brand may remain relatively unaffected. This reflects the inherent asymmetry of co-branding, with gains accruing to the less established partner and losses weighing more heavily on the more prominent partner (Radighieri *et al.*, 2014). These findings, although insightful, tend to overemphasise brand strength and overlook the role of the product category (Voss *et al.*, 2025), as they mainly reflect partnerships involving widely accepted, socially neutral ingredients (Radighieri *et al.*, 2014; Chu, 2025). This raises the question of whether the research results obtained so far will hold when an ingredient brand is active in a controversial product category, such as edible insects.

The research is grounded in schema congruity theory (Mandler, 1982; Meyers-Levy and Tybout, 1989) and the stereotype content model (Fiske *et al.*, 2002). The empirical context centres on insect-based food, a novel category in which insects are used as ingredients in familiar products, such as crackers, pasta and salty snacks.

3. Theoretical framework

3.1 Schema congruity theory

Incongruity plays a crucial role in consumer responses and influences how products are experienced and valued (Gao *et al.*, 2022; Kraus and Gierl, 2017). Product success is often linked to how consumers perceive incongruity relative to their expectations (Gao *et al.*, 2022). These perceptions are shaped by cognitive schemas that function as stable mental structures built from prior experiences that guide the interpretation of new information (Mandler, 1982).

According to schema congruity theory, congruity occurs when a stimulus matches an existing schema, whereas incongruity arises from a mismatch (Mandler, 1982; Meyers-Levy and Tybout, 1989). Encountering incongruity activates a drive to resolve the discrepancy by updating the schema. Successful updating produces gratification and favourable evaluations (Yoon, 2013). The schema–stimulus interaction may produce three outcomes. A congruent product does not elicit deep cognitive processing, as familiarity tends to generate a positive evaluation despite limited novelty (Meyers-Levy and Tybout, 1989). A moderately incongruent product stimulates cognitive engagement, promotes schema updating and elicits positive affect through the resolution of discrepancy (Mandler, 1982). A highly incongruent product also activates cognitive processing, yet its complexity may exceed consumers' cognitive resources and produce irritation, frustration or disengagement (Yoon, 2013).

This schema–stimulus relationship follows an inverted U-shaped pattern, whereby moderate incongruity generates the highest levels of attention, curiosity and affect (Meyers-Levy and Tybout, 1989; Noseworthy *et al.*, 2014). In brand extension

contexts, moderately incongruent products are evaluated more favourably and purchased more often than congruent or highly incongruent alternatives (Meyers-Levy *et al.*, 1994; Srivastava and Sharma, 2012). Eye-tracking technique shows that incongruent stimuli elicit longer and more numerous fixations, signalling heightened attention (García-Carrón *et al.*, 2023). Physiological indicators also show stronger arousal in response to incongruent rather than congruent stimuli (Noseworthy *et al.*, 2014).

Schema congruity theory has been extended to controversial categories such as unhealthy food, where moderate incongruity between health claims and product attributes improves evaluations (Cheong and Kim, 2011). Familiarity is another determinant of consumer responses. This role is captured by the “mere exposure effect”, according to which repeated exposure increases familiarity and preference (Zajonc, 1968). This effect is explained by perceptual fluency: ocular-tracking studies show that familiar stimuli are processed more efficiently because pre-existing mental representations reduce cognitive load, thereby facilitating comprehension and positive affect (Fang *et al.*, 2007). In incongruent settings, familiar brands attenuate negative reactions and elicit more favourable responses than unfamiliar ones (Nega *et al.*, 2025). Neuroscientific evidence indicates that unfamiliar stimuli require longer fixation times, reflecting greater cognitive load (Althoff and Cohen, 1999).

Resolving incongruity is essential to generating positive affect. When supported by informational cues, consumers may experience an “Aha, I get it!” response that transforms uncertainty into satisfaction (Yoon, 2013). In co-branding, moderate incongruity improves perceived product quality and consumer attitudes by stimulating curiosity and facilitating discrepancy resolution (Kraus and Gierl, 2017). Curiosity is also positively associated with arousal and interest (Hill *et al.*, 2016; Litman, 2005).

The present study explores two dimensions of incongruity:

- 1 the juxtaposition of a fully legitimised product category (e.g. pasta) with a controversial one (e.g. insect-based food); and
- 2 the level of brand familiarity between the host (familiar) and ingredient (unfamiliar) brands.

The study posits that the first dimension generates incongruity, with effects moderated by brand familiarity. An unfamiliar ingredient brand shown alone may elicit limited curiosity due to the lack of a preexisting schema associated with low familiarity while also failing to elicit the positive effects of mere exposure, whereas a familiar brand, either alone or in co-branding, may activate preexisting schemas, trigger perceived incongruity and motivate schema resolution. Building on the arguments above, the following hypotheses are proposed:

- H1. In a controversial product category, host brand alone and ingredient co-branding generate higher curiosity than ingredient brand alone.
- H2. In a controversial product category, host brand alone and ingredient co-branding increase purchase intention more than ingredient brand alone.

By pairing a familiar brand with an unfamiliar one, co-branding is expected to generate greater incongruity than single-brand strategies, as it combines established cognitive structures with novel, unassimilated elements. This proposition is consistent with evidence showing that moderate incongruity in co-branding

and visual stimuli enhances curiosity and interest (Hollingworth and Henderson, 2000; Kraus and Gierl, 2017; Yoon, 2013).

This study employs three eye-tracking metrics. Fixation duration captures cognitive effort: familiar brands require less processing because of memory traces, whereas unfamiliar brands demand more processing time. Revisits measure semantic informativeness and correlate positively with incongruity and surprise (Foerster, 2016; Hollingworth and Henderson, 2000; Vö et al., 2010). Peak saccadic velocity is used as an indicator of emotional intensity (Di Stasi et al., 2013). On this basis, the following hypotheses are advanced:

- H3a. Ingredient brand alone leads to longer fixation durations than co-branding or the host brand alone.
- H3b. Ingredient co-branding leads to more revisits than the ingredient brand or the host brand alone.
- H3c. Ingredient co-branding elicits a higher peak velocity of saccades than the ingredient brand or the host brand alone.

3.2 Brands as intentional agents

The extant literature highlights that the effectiveness of brand communication hinges on consumers' perceptions of the brands involved (Eigenraam et al., 2021). Beyond their features (e.g. functional), brands are understood as relational and emotional constructs, with affective and interpersonal meanings that play a central role in shaping consumer responses (Aaker et al., 2004; Kervyn et al., 2022). On this basis, the mechanisms guiding the social evaluations of individuals and groups can also be applied to how consumers perceive and relate to brands (Aaker et al., 2012).

Within this perspective, the stereotype content model (Fiske et al., 2002) provides a psychological basis for explaining how people organise perceptions of others through stereotypes, conceived as generalised evaluative judgements. These judgements are structured around warmth and competence, which refer to whether others' goals are perceived as beneficial or harmful to the self and whether they are capable of achieving those goals (Cuddy et al., 2007). Since consumers perceive brands not only as symbols of product attributes but also as intentional social agents, this model has been extended to branding through the "brands as intentional agents" framework (Kolbl et al., 2025). In branding, warmth includes helpfulness, sincerity, friendliness and trustworthiness, whereas competence refers to efficiency, intelligence, conscientiousness and skill (Kervyn et al., 2022).

Over the past decade, the brands as intentional agents framework has attracted increasing attention, showing that perceptions of warmth and competence influence brand evaluation, choice and loyalty (Kervyn et al., 2022). These effects vary according to product category (Zawisza and Pittard, 2015), company size (Yang and Aggarwal, 2018), product aesthetics (Chen, 2021) and logo design (Kim and Dempsey, 2019).

Brands as intentional agents framework is especially relevant in co-branding, where differences between partner brands may shape consumer evaluations. Moderate dissimilarity in warmth produces more favourable evaluations than either similarity or strong discrepancy, whereas competence dissimilarity appears less consequential (van der Lans et al., 2014). In partnerships between for-profit firms and nonprofit organisations, the

competence of the former and the warmth of the latter jointly enhance consumer preferences (Lee et al., 2018). Similar effects emerge when for-profit partners are perceived as competent (Crisafulli et al., 2020), as well as in co-branding involving hedonic products and a pairing between an unknown competent brand and a reputable warm brand (Zhang and Guo, 2023).

Alongside warmth and competence, a third stereotype dimension has recently gained prominence in brand perception: ideology (Mangio et al., 2024). Brands are increasingly evaluated not only for emotional appeal or technical performance but also for their ability to engage with ideological tensions that consumers consider meaningful (Holt, 2004). Ideology can be defined as a shared point of view concerning a cultural construct that, through internalisation, becomes accepted as a social "truth" within a group (Holt, 2004). By combining emotional and rational elements, the moral dimension of ideology (Zollo, 2021) becomes particularly relevant in ethically sensitive markets, where it allows consumers to rationalise their choices as value-driven and strengthen in-group belonging (Holt and Cameron, 2010). Ideological framing may help brands deflect criticism by positioning them within broader sociocultural debates (Kozinets and Handelman, 2004). This dynamic is increasingly visible in the food sector, where ethical meanings shape emerging categories such as edible insects through values linked to sustainability and animal welfare (Valesi et al., 2024; Wang et al., 2024).

Despite these insights, empirical research on ideological alignment in co-branding, whether between partnering brands or between brands and consumers, remains scarce. Given the predominance of warmth and competence in the positioning of consumer goods brands, a well-known host brand paired with a lesser-known ingredient brand is likely to be evaluated more positively when the latter adopts a warm or competent positioning rather than an ideological one. In controversial markets, emotional appeals often play a central role in fostering legitimacy and may outperform purely rational arguments (Gebreselassie and Bougie, 2024; Mangio et al., 2024). On this basis, the following hypothesis is proposed:

- H4. A warm positioning of the ingredient brand generates the perception of a greater fit with a host brand than a competent or ideological positioning.

4. Methodology

4.1 Pre-tests

The research involved two pre-tests aimed at preparing the stimuli for the main experimental study. In the first pre-test, a convenience sample of 166 Italian participants (63.3% female; 23.5% aged 51–60) evaluated 27 food categories that could contain insects as an ingredient, using a seven-point Likert scale developed by the researchers (see Appendix 1). A repeated measures analysis of variance revealed a significant effect of product category on perceived appropriateness ($F(11.716, 1933.067) = 28.804, p < 0.001$, partial $\eta^2 = 0.149$). Based on the mean scores, salty snacks ($M = 4.2$, $SD = 2.1$), crackers ($M = 4.0$, $SD = 2.1$) and pasta ($M = 3.9$, $SD = 2.2$) emerged as the most acceptable carriers for insect ingredients. This result aligns with evidence that savoury tastes facilitate greater consumer acceptance of insect-based foods

(Tan *et al.*, 2016). On this basis, these three categories were selected for the experimental phase.

Grounded in brands as intentional agents framework, the second pre-test aimed to validate three brand positioning statements for an ingredient brand in the insect-based food sector. The statements reflected three positioning strategies: warmth, competence (Aaker *et al.*, 2012) and ideology (Holt, 2004). The warmth positioning emphasised emotionality, passion and care. The competence positioning highlighted the values of logic, leveraged factual data and presented the sustainable value of insects. The ideological positioning framed insect consumption as a challenge to conventional animal-based diets (see Appendix 2).

A convenience sample of 45 Italian participants (42.2% female; 88.9% aged 18–25) completed an online questionnaire. The participants were presented the three brands as intentional agents framework-based statements and were asked to assign scores for warmth, competence and ideology. Warmth and competence were measured with a seven-point, single-item Likert scale and were drawn and adapted from the two-item scales of Aaker *et al.* (2012). The warmth scale measured perceived warmth and friendliness, whereas the competence scale evaluated the perceived competence and capability of brands. The ideological scale was designed to assess brands by drawing on the conceptual relationship between ideology and dogmatism (Jost *et al.*, 2003) (see Appendix 2). Repeated measures ANOVA confirmed that the three positioning statements were perceived as distinct: warmth ($F(1.790, 78.776) = 14.735$, $p < 0.001$, partial $\eta^2 = 0.251$), competence ($F(2, 88) = 9.387$, $p < 0.001$, partial $\eta^2 = 0.176$) and ideology ($F(1.801, 79.265) = 6.777$, $p < 0.01$, partial $\eta^2 = 0.133$).

4.2 Selection of host and ingredient brands

Host and ingredient brands were selected through a matching procedure based on the product categories identified in the first pre-test: salty snacks, crackers and pasta. Host brands were chosen using the research firm Circana secondary-market data, focusing on brands with the highest value and volume shares in each category. Ingredient brands were drawn from existing insect-based food companies to preserve ecological validity and consistency with the non-fictitious host brands, then arbitrarily assigned to three validated positioning statements: warm, competent and ideological.

4.3 Main study: the experiment

4.3.1 Participants

A total of 70 Italian participants (51.4% female; 74.3% aged 18–25) were recruited via convenience sampling for the main study (see Appendix 3). The sample reflected recent data identifying young people as the primary consumers of insect-based foods (IPIFF, 2024). The sample nationality was also in line with the host brands chosen for the experiment, given their strong presence and established market position within this national context. Before participating, participants signed an informed consent form stating the study's anonymity, the instruments used, and their voluntary participation.

Sample size was determined through an *a priori* power analysis using G*Power 3.1.9.7, based on a repeated measures ANOVA model with the following parameters: effect size = 0.2, $\alpha = 0.05$, power = 0.95, $\rho = 0.5$ and $\epsilon = 1$. The minimum

recommended sample size was 66. The chosen power level exceeded the median statistical power (21%) reported in neuroscience research (Button *et al.*, 2013). To ensure robustness, each experimental stimulus was observed 70 times, exceeding the recommended threshold of 20–30 (Plassmann *et al.*, 2015; Holmqvist *et al.*, 2017). This resulted in 1,260 observations for objective 1 and 630 observations for Objective 2. Objective 1 considered responses from 70 participants exposed to 18 stimuli across 3 experimental branding conditions (6 stimuli and 420 observations per condition). Objective 2 used 210 observations per positioning condition with responses to three host brands.

4.3.2 Procedure and experimental design

All experimental sessions were conducted in a controlled university laboratory setting and followed a within-subject design. The room was quiet, artificially lit and maintained at a constant temperature to ensure consistency across sessions. The procedure was divided into two main phases: preliminary preparation and stimulus exposure. In the preliminary phase, the participants were welcomed individually, and the experimental procedure was explained verbally to ensure full comprehension. The participants were encouraged to ask questions before proceeding to ensure that the task was fully understood. Once briefed, each participant was comfortably seated approximately 60 cm from a monitor equipped with an eye-tracking device. A nine-point calibration procedure was conducted to ensure accurate eye movement recording. From this point onward, all instructions were delivered in written form via the software interface.

The stimuli exposure phase began with an instructional screen outlining the task. The participants were then exposed to 18 randomised blocks (illustrated in Appendix 4), each consisting of three sequential components: a fixation cross displayed (two seconds), a product image shown (six seconds) and a questionnaire measuring curiosity and purchase intention (no time limit). The number of blocks was equal to the number of product images (i.e. 18) and was presented in a random order.

After the exposure phase, the participants completed a brand familiarity scale that assessed their recognition of both the host and ingredient brands featured in the experiment. Given that consumers are generally unfamiliar with ingredient brands, unlike host brands (Kotler and Pfoertsch, 2010), the familiarity assessment served as a validity check. A brand fit scale was then administered. The participants read the brand positioning statement (validated in pre-test 2) associated with the ingredient brand and rated its perceived fit with each of the three host brands. Each positioning statement was uniquely paired with one ingredient brand. Demographic data were collected at the end of the session. Calibration, stimuli administration, eye data acquisition and metric generation were managed using iMotions software (version 9.4).

4.3.3 Stimuli manipulation

For the first objective, a set of visual stimuli was developed to represent strategic branding options across the three product categories. The study adopted a within-subject design with a single three-level factor (host brand alone, ingredient brand alone, ingredient co-branding), with branding strategy as the only manipulated factor. For each product category, two

packaging variants were created, resulting in six total variants ($2 \times$ salty snacks, $2 \times$ crackers and $2 \times$ pasta). Each packaging variant was rendered in three branding formats: host brand only, ingredient brand only and ingredient co-branding, producing 18 stimuli in total (6 per branding condition; see [Appendix 5](#)). The three product categories, together with the two variants of each, were not conceived as manipulation factors *per se*. Rather, they were incorporated as control variables to account for potential content-related variance and to reinforce the robustness and generalisability of the findings.

A within-subject design with a single three-level factor (warm, competent and ideological positioning) was also used for the second objective. Participants were presented with a scenario indicating that the ingredient brand, described according to one of the three positioning strategies, had the opportunity to enter a co-branding partnership with three highly familiar brands. Participants were subsequently invited to assess the suitability of the collaboration for each host brand.

To ensure visual consistency, all stimuli were standardised in brightness and saturation. The packaging dimensions matched those of real products to preserve ecological validity. Given that two of the three host companies had the colour red in their brands, two ingredient brands that also presented this colour were selected.

4.3.4 Measures

4.3.4.1 Eye tracker. The participants' eye movements were recorded using a Tobii Pro Spectrum eye-tracking bar positioned beneath a 23.8-inch monitor (1920×1080 resolution). Data were collected at a 300 Hz sampling rate with a spatial accuracy of 0.3° . Fixations and saccades were identified using the I-VT filter ([Holmqvist et al., 2017](#)), which classifies fixations as eye movements lasting over 60 ms with a visual angle below 0.5° and a velocity under $30^\circ/\text{second}$. Movements exceeding this threshold were categorised as saccades. To avoid bias from pre-stimulus fixations overlapping with stimulus onset, fixations initiated before stimulus onset were excluded ([Siegrist et al., 2015](#)). Visual attention was assessed using areas of interest (AOIs) as the unit of analysis, which represents a region of space in which ocular data can be processed in fixation and saccade metrics ([Holmqvist et al., 2017](#)). The AOIs were delineated to encompass the portion of packaging where the individual brand appears for the host and ingredient brand alone condition as well as the dual brand for the ingredient co-branding one.

Two fixation metrics and one saccade metric were calculated: fixation duration, measured in milliseconds, reflects the time the eye remains stationary and is positively associated with interest ([Russo et al., 2020](#)). To control for size potential bias, since ingredient co-branding AOIs were larger, this metric was normalised by dividing fixation time by the AOI area (ms/cm^2) ([Ceravolo et al., 2019](#)). Revisits, defined as the number of times the gaze returns to an AOI after leaving it, indicate semantic informativeness; higher revisit counts suggest greater perceived informational value ([Holmqvist et al., 2017](#)). The peak velocity of saccades, calculated within AOIs, serves as a proxy for arousal, with higher values reflecting increased physiological activation ([Di Stasi et al., 2013](#)).

4.3.4.2 Questionnaire. Participant responses to the questionnaire were collected in two phases. In the first phase, curiosity and purchase intention were measured using

single-item, seven-point Likert scales sourced from [Gerrath and Biraglia \(2021\)](#) and [Lammers et al. \(2019\)](#), anchored totally disagree–totally agree (curiosity) and not likely–likely (purchase intention). These items were administered following each of the 18 stimulus blocks. The second phase, conducted after the stimulus exposure, assessed brand familiarity and brand fit using adapted scales. Brand familiarity was measured across six brands using a two-item, five-point Likert scale (totally disagree–totally agree) ([Acharya, 2021](#)) that excluded the experiential item because the limited market penetration of insect-based products in Italy could have introduced measurement errors. Brand fit was evaluated via a four-item, seven-point Likert scale (totally disagree–totally agree) ([Gwinner and Bennett, 2008](#)) that compared ingredient co-branding formats based on the ingredient brand's positioning. To ensure contextual relevance, item wording was adapted to include recognisable hosts and unknown ingredient brands featured during the experiment.

Reliability was assessed via Cronbach's α for both constructs, whereas composite reliability and average variance extracted were computed for brand fit only because brand familiarity comprised fewer than three items ([Kline, 2016](#)). Cronbach's α and composite reliability values exceeded the 0.70 threshold, while average variance extracted surpassed 0.50, confirming internal consistency and convergent validity ([Hair et al., 2019](#)) (see [Appendix 6](#) for items, reliability and validity tests).

4.3.5 Statistical analyses

Descriptive statistics were estimated for all the variables used. Each research variable was also scored by calculating the average sum of the participants' responses. As all the participants were exposed to the same stimuli, a one-way repeated measures ANOVA was performed to assess the impact of the three scenarios tested (i.e. host brand alone, ingredient brand alone and ingredient co-branding) on the questionnaire variables, including curiosity and intention to purchase, and on the neuroscientific metrics of fixation duration, revisits and peak velocity of saccades. The same test was used to evaluate the effect of the brand positioning statement on the brand fit scale construct. Repeated measures ANOVA was also performed in the validity check to ascertain differences in brand familiarity.

To address violations of sphericity, as indicated by the significance of Mauchly's test ($p < 0.05$), the degrees of freedom were corrected using Greenhouse-Geisser's ϵ value ([Blanca et al., 2023](#)). If this value was > 0.75 , the Huynh-Feldt correction was applied. For values < 0.75 , the Greenhouse-Geisser correction was used ([Verma, 2016](#)). Post-hoc comparisons were implemented using Bonferroni's coefficient. All statistical tests were executed using SPSS version 27 software ([Field, 2024](#)).

5. Results

5.1 Validity check: brand familiarity

In the post-experiment questionnaire, participants assessed familiarity with the six brands adopted. As selected familiar host brands do not produce insect-based foods, familiarity ensured participants distinguished their role from ingredient brands' involvement in insect-food production. A repeated measures ANOVA, with brand as the independent variable and familiarity as the dependent variable, was significant after Greenhouse-Geisser correction ($\epsilon = 0.351$) following

Mauchly's test violation ($F(1.757, 121.221) = 984.170, p < 0.001$, partial $\eta^2 = 0.934$), confirming that all ingredient brands were perceived as less familiar than host brands (Appendix 7).

5.2 Objective 1: host brand alone, ingredient brand alone and ingredient co-branding

The first objective of the study was to test the impact of the three experimental conditions (host brand alone, ingredient brand alone and ingredient co-branding) on the self-reported measures of curiosity and intention to purchase as well as on the attentional and emotional arousal metrics. The statistics of the analyses are presented in Appendix 8. For curiosity, Mauchly's test showed a violation of sphericity assumption $\chi^2(2) = 20.152, p < 0.001$. Considering that the Greenhouse–Geiser ϵ value was higher than 0.75, the degrees of freedom were corrected with Huynh–Feldt sphericity estimates. The results showed that brand strategy had a significant effect ($F(1.623, 112.007) = 6.627, p < 0.01$, partial $\eta^2 = 0.088$). The Bonferroni-corrected pairwise comparisons revealed that the conditions host brand alone ($M_{\text{host alone}} = 4.51, SD = 1.27$, versus $M_{\text{ingredient alone}} = 4.27, SD = 1.29, p < 0.05$, 95% CI [0.040, 0.446]) and ingredient co-branding ($M_{\text{ingredient co-branding}} = 4.45, SD = 1.3$, versus $M_{\text{ingredient alone}} = 4.27, SD = 1.29, p < 0.01$, 95% CI [0.060, 0.311]) prompted greater curiosity than ingredient brand alone, which supported *H1*. No difference was found between host alone and ingredient co-branding ($M_{\text{host alone}} = 4.51, SD = 1.27$, versus $M_{\text{ingredient co-branding}} = 4.45, SD = 1.3, p > 0.05$, 95% CI [-0.118, 0.233]).

Regarding intention to purchase, Mauchly's test ($\chi^2(2) = 27.602, p < 0.001$) suggested a correction. As the ϵ value was less than 0.75, the Greenhouse–Geiser method for degrees of freedom adjustment was selected. Consistent with curiosity, repeated measures ANOVA showed similar results ($F(1.500, 103.477) = 10.130, p < 0.001$, partial $\eta^2 = 0.128$). The experimental conditions host brand alone ($M_{\text{host alone}} = 3.74, SD = 1.4$, versus $M_{\text{ingredient alone}} = 3.35, SD = 1.33, p < 0.01$, 95% CI [0.135, 0.656]) and ingredient co-branding ($M_{\text{ingredient co-branding}} = 3.55, SD = 1.36$, versus $M_{\text{ingredient alone}} = 3.35, SD = 1.33, p < 0.01$, 95% CI [0.060, 0.354]) stimulated greater intention to purchase than the ingredient brand alone, which supported *H2*. No difference emerged between host alone and ingredient co-branding ($M_{\text{host alone}} = 3.74, SD = 1.4$, versus $M_{\text{ingredient co-branding}} = 3.55, SD = 1.36, p > 0.05$, 95% CI [-0.035, 0.411]).

As to fixation duration, Mauchly's sphericity test violation $\chi^2(2) = 20.720, p < 0.001$ suggested Huynh–Feldt's correction ($\epsilon > 0.75$). Repeated measures ANOVA showed a statistical significance between experimental conditions ($F(1.615, 111.435) = 37.063, p < 0.001$, partial $\eta^2 = 0.349$) and revealed that the participants fixated longer on the ingredient brand alone ($M_{\text{ingredient alone}} = 33.53, SD = 10.32$, versus $M_{\text{ingredient co-branding}} = M = 29.45, SD = 7.35, p < 0.001$, 95% CI [1.757, 6.392]; $M_{\text{ingredient alone}} = 33.53, SD = 10.32$, versus $M_{\text{host alone}} = M = 22.44, SD = 9.46, p < 0.001$, 95% CI [7.294, 14.872]; $M_{\text{host alone}} = 22.44, SD = 9.46$, versus $M_{\text{ingredient co-branding}} = M = 29.45, SD = 7.35, p < 0.001$, 95% CI [-10.311, -3.706]) than on the ingredient co-branding or the host brand alone. All the post-hoc pairs of comparisons were significant.

Relative to revisits, upon confirmation of sphericity $\chi^2(2) = 0.190, p > 0.05$, repeated measures ANOVA indicated

a significant effect ($F(2, 138) = 9.053, p < 0.001$, partial $\eta^2 = 0.116$). The post-hoc analyses exhibited significant results when the ingredient co-branding was compared with the host brand alone ($M_{\text{ingredient co-branding}} = 1.64, SD = 0.55$, versus $M_{\text{host alone}} = 1.37, SD = 0.63, p < 0.01$, 95% CI [0.099, 0.454]) and with ingredient brand alone ($M_{\text{ingredient co-branding}} = 1.64, SD = 0.55$, versus $M_{\text{ingredient alone}} = M = 1.4, SD = 0.55, p < 0.01$, 95% CI [0.067, 0.413]), whereas no statistically significant difference was found between host and ingredient brand alone ($M_{\text{host alone}} = 1.37, SD = 0.63$, versus $M_{\text{ingredient alone}} = 1.4, SD = 0.55, p > 0.05$, 95% CI [-0.206, 0.133]). Taken together, the results show that the ingredient co-branding induced greater revisits than the other two conditions.

Once the sphericity requirement was met ($\chi^2(2) = 0.722, p > 0.05$), a statistically significant effect was also found for the peak velocity of saccades ($F(2, 138) = 78.822, p < 0.001$, partial $\eta^2 = 0.533$). Ingredient co-branding produced a greater effect than the host ($M_{\text{ingredient co-branding}} = 156.47, SD = 31.14$, versus $M_{\text{host alone}} = 116.41, SD = 36.36, p < 0.001$, 95% CI [30.966, 49.169]) and the ingredient brand alone ($M_{\text{ingredient co-branding}} = 156.47, SD = 31.14$, versus $M_{\text{ingredient alone}} = 119.81, SD = 30.28, p < 0.001$, 95% CI [28.305, 45.015]). No statistically significant difference was found between the host brand and ingredient brand alone ($M_{\text{host alone}} = 116.41, SD = 36.36$, versus $M_{\text{ingredient alone}} = 119.81, SD = 30.28, p > 0.05$, 95% CI [-11.983, 5.168]). This pattern indicates that ingredient co-branding resulted in a more pronounced state of arousal than the host or the ingredient brand alone. These results supported *H3a–c*.

5.3 Objective 2: the positioning of the ingredient brand

The second objective was to assess the most effective brand positioning (warm, competent and ideological) for an ingredient brand starting an ingredient co-branding initiative with a well-known incumbent brand. As shown in Appendix 8, a repeated measures ANOVA was performed. No violation of sphericity was found ($\chi^2(2) = 1.607, p > 0.05$). The test indicated a statistically significant difference across the three positionings ($F(2, 138) = 5.011, p < 0.01$, partial $\eta^2 = 0.068$). A post-hoc comparison revealed that the warm positioning statement received significantly higher rates of brand fit compared to the competent ($M_{\text{warmth}} = 4.09, SD = 1.41$, versus $M_{\text{competence}} = 3.87, SD = 1.35, p < 0.05$, 95% CI [0.027, 0.416]) and ideological ($M_{\text{warmth}} = 4.09, SD = 1.41$, versus $M_{\text{ideology}} = 3.91, SD = 1.39, p < 0.05$, 95% CI [0.012, 0.353]) positioning. No significant difference was found between the competent and the ideological brand positioning ($M_{\text{competence}} = 3.87, SD = 1.35$, versus $M_{\text{ideology}} = 3.91, SD = 1.39, p > 0.05$, 95% CI [-0.223, 0.144]), a result that supports *H4*.

6. Discussion

This study pursued two main objectives: to identify which branding strategy (host brand alone, ingredient brand alone or ingredient co-branding) is most effective for accessing a controversial product category, and to examine, within the co-branding condition, whether the ingredient brand's positioning (warm, competent or ideological) affected its suitability as a strategic partner. A multi-method approach combining eye

tracking and self-report measures was used, which allowed for a comprehensive understanding of the phenomenon's schema.

The results addressing the first objective showed that both the host brand alone and ingredient co-branding elicited greater perceived curiosity than the ingredient brand alone. This finding aligns with prior research demonstrating that brand collaboration increases curiosity (Can *et al.*, 2020), particularly when compared to unfamiliar brands (Kraus and Gierl, 2017) or novel brand extensions (Gerrath and Biraglia, 2021). These effects are consistent with schema congruity theory (Mandler, 1982; Meyers-Levy and Tybout, 1989).

This pattern was also observed for the intention to purchase, which was higher for the host brand and ingredient co-branding conditions than for the ingredient brand alone. This finding is consistent with the literature indicating that curiosity enhances attitudes and boosts purchase motivation (Kraus and Gierl, 2017). The schema congruity effect explains this result by arguing that the very process of resolving incongruity positively shapes attitudes towards a product (Meyers-Levy and Tybout, 1989) and ultimately increases purchase intent (Forgas, 1995; Hill *et al.*, 2016). This effect is noticeable when individuals encounter novel or ambiguous stimuli with limited prior knowledge (Forgas, 1995).

The eye-tracking data reinforce this interpretation. Longer fixation durations emerged in the ingredient brand alone condition. One explanation is that this pattern reflects the salience of negatively valenced cues, as attention tends to be drawn to stimuli associated with discomfort or threat (Veerapa *et al.*, 2020; Seligman, 1971). Insect imagery within ingredient logos may have triggered such a response, which is in line with evidence showing that insect-related visuals worsen product evaluations (Pozharliev *et al.*, 2023). Longer fixation duration on the ingredient brand alone may also be attributed to unfamiliarity. The mere exposure effect suggests that unfamiliar stimuli demand greater cognitive effort and produce longer fixations and dwell times (Zajonc, 1968; Althoff and Cohen, 1999). Familiar options such as the host brand and the co-branded product are processed more fluently and attract shorter fixations (Heisz and Shore, 2008). As perceptual fluency is associated with more positive affective evaluations (Fang *et al.*, 2007), these visual responses may indicate stronger preference for the more familiar branding strategies.

Ingredient co-branding also generated a higher number of revisits than either brand presented alone. This pattern suggests that the co-branded stimulus created a level of expectancy violation sufficient to attract renewed visual inspection. Such a response is consistent with the cognitive-evolutionary theory of surprise, which holds that unexpected stimuli intensify attention and encourage further exploration (Vö *et al.*, 2010; Foerster, 2016; Hollingworth and Henderson, 2000). Peak saccadic velocity was also higher in the co-branding condition, indicating stronger arousal. This response fits schema congruity theory, which links novelty and surprise with autonomic activation (Mandler, 1982; Meyers-Levy and Tybout, 1989). Arousal sustains curiosity and supports the motivation to resolve incongruity (Berlyne, 1960).

As for brand positioning, a warm ingredient brand was perceived as a more suitable partner than brands positioned as competent or ideological. This finding supports the view that emotional factors carry greater weight than cognitive ones in the acceptance of insect-based products (Valesi *et al.*, 2024),

while also confirming the effectiveness of emotional appeals in controversial marketing contexts (Gebreselassie and Bougie, 2024). The stronger performance of warm positioning highlights its central role in brand evaluation and supports the brands as intentional agents framework, together with the stereotype-based mechanisms through which consumers interpret brands (Kervyn *et al.*, 2022).

7. Theoretical implications

This paper advances the theoretical understanding of ingredient co-branding by extending its relevance to controversial product categories. Ingredient co-branding is typically understood as a strategy through which a host brand partners with an ingredient brand to enhance brand perception and support entry into a new market (Desai and Keller, 2002; Kotler and Pfoertsch, 2010). Although research on ingredient co-branding is well established (Pinello *et al.*, 2022; Ottoni *et al.*, 2025), limited attention has been devoted to markets that lack full legitimacy, are affected by stigma, or are shaped by problematic social evaluations. This omission has constrained the recognition of co-branding as a strategic go-to-market option for both incumbents and new entrants. The present findings suggest that brands seeking access to a controversial market may benefit from forming a strategic partnership with an ingredient maker.

The study also refines current understanding of partner selection in ingredient co-branding. Existing research on branding and co-branding has highlighted the relevance of brand perception as an intentional agent in driving marketing outcomes (Crisafulli *et al.*, 2020), yet this mechanism has received limited attention in ingredient co-branding contexts. Drawing on the brands as intentional agents framework (Kervyn *et al.*, 2022), this study extends prior evidence showing that perceived warmth improves behavioural intentions toward controversial products (Sadler *et al.*, 2015). The findings indicate that partnerships are evaluated more favourably when the ingredient brand adopts a warm positioning.

The paper also contributes to schema-congruity theory by showing that co-branding can function as a mechanism for managing schema violation and improving product evaluations. Previous studies have mainly examined congruity effects at the level of product categories, such as stigmatized versus non-stigmatized products, and branding dimensions, such as familiarity (Lee *et al.*, 2020). Co-branding has remained underexplored in this respect. The findings show that ingredient co-branding can facilitate the resolution of schema incongruity and support more favourable consumer evaluations.

8. Managerial implications

Entering new markets entails substantial risk for consumer brands (Aaker and Keller, 1990; Leuthesser *et al.*, 2003). Although firms have long relied on product and service extensions to mitigate this risk, a considerable proportion of brand extensions still fail (Su *et al.*, 2021). The present findings offer relevant implications for marketing and brand managers seeking access to markets associated with controversial products. Ingredient co-branding emerges as the most effective strategy for fostering consumer acceptance, especially when compared with market entry without a strategic partner. As many ingredient suppliers remain relatively invisible to end

consumers and typically operate at a distance from final demand (Kotler and Pfoertsch, 2010), ingredient co-branding provides a credible mechanism for accelerating market penetration, strengthening acceptance, and supporting product legitimation. Its effectiveness increases when the ingredient brand is paired with a highly familiar host brand.

The results also inform host-brand strategy. Ingredient co-branding proved to be the most effective option, while the host brand alone represented the second strongest alternative. In early stages of market development, co-branding may help host brands benefit from collaboration while reducing perceived risk. As the product category becomes more legitimate and the controversial nature of the market weakens, a host-brand-only strategy may also become viable.

The findings offer guidance for partner selection as well. Host brands considering ingredient co-branding should pay close attention to brand fit, which has already been identified as a critical determinant of partnership success (Dickinson and Heath, 2006). The evidence suggests that brands positioned as warm are more suitable partners than brands positioned as competent or ideological. A warm positioning, expressed consistently across all touchpoints, may reduce the negative affect often associated with controversial products, including the disgust elicited by insect-based foods. This objective requires an integrated communication strategy involving voice, visual identity, packaging, partnerships and endorsements. A coherent warm image may be conveyed through stylised or anthropomorphised insect imagery and rhetorical devices eliciting emotions such as enjoyment, fun or surprise (Pozharliev et al., 2023).

The superiority of warm positioning should be interpreted with caution, as these effects were validated only among end consumers. Other relevant actors, including distributors, retailers and trade partners, may respond differently. Trade marketing strategies are often different from those addressed to end-consumers, and the findings of this study do not rule out the possibility that, for example, a competent positioning could be taken more positively than a warm positioning by trade partners.

9. Limitations and future research

Despite its contributions, this study has limitations that open several avenues for future research. The analysis focused on a single product category, which calls for caution in extending the findings beyond the food sector. Future studies should examine ingredient co-branding in other controversial categories, including cannabis-infused goods, protein-enriched products and cultured meat. Insect-based foods were selected because they have been shown to elicit stronger adverse reactions than other novel food sources, such as cultivated meat (Heijink et al., 2023; Chia et al., 2024).

Future research should also extend the analysis beyond food. In light of the hedonic-utilitarian distinction in food perception (Maehle et al., 2015), it would be useful to test whether competent or ideological positioning is more effective in utilitarian categories than in hedonic ones, such as insect-based food. Other brand dimensions, including reputation, equity and authenticity, also deserve attention for their possible role in shaping co-branding effectiveness in controversial markets.

Cultural variability in responses to controversial products represents another important research direction (Hartmann et al., 2015; Lin et al., 2019). Since the present study was conducted in a Western setting, cross-cultural comparisons between Western and Eastern contexts are needed, especially in the case of edible insects. Such work may clarify whether branding strategies perform differently across cultures and whether traits such as uncertainty avoidance shape responses to norm-challenging products (Hofstede, 1984; Velasco Vizcaino and Pohlmann, 2025).

A noteworthy limitation concerns the absence of a longitudinal perspective, which remains underexplored in ingredient co-branding research (Luffarelli et al., 2023). Future studies should examine how perceptions evolve over time and how these dynamics influence perceived fit and evaluations of co-branding partnerships.

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Appendix 1. Pre-test 1: food categories and insect meal suitability

Suitability scale: Indicate the extent to which you think it would be appropriate for each of these food categories to include insect meal as an ingredient (1 = 'absolutely inappropriate', 7 = 'absolutely appropriate').

Pre-test 1: food product categories

- Spoonable desserts
- Ice creams
- Crackers
- Breadsticks
- Meat
- Sweet snacks
- Salty snacks (excluding crisps or similar)
- Bread
- Gluten-free bread
- Biscuits
- Sweets
- Croissant
- Cereal bars mixed
- Pre-mixes (dry) for baked products
- Puffs/curls-type extruded snack
- Fresh egg pasta
- Dried pasta
- Gluten-free pasta
- Gnocchi
- Processed mixed cereal-based flakes
- Potato croquettes
- Pralines
- Jelly candies
- Pizza
- Pesto
- Mayonnaise sauce
- Fresh egg-filled pasta

Source: Authors' own work

Appendix 2. Pre-test 2: brand positioning statements and warmth, competence and ideology scales

Warm positioning: [Ingredient brand 1] is a start-up company established in 2020 dedicated to the breeding of insects for human consumption. The brand positioning statement of [Ingredient brand 1] is: our mission is driven by an unbreakable passion, a passion that stretches from the depths of our hearts to the farthest corners of our planet. We believe in the transformative power of insects as a food source, and our journey is an emotional path rooted in love for both humanity and the Earth.

Competent positioning: [Ingredient brand 2] is a company dedicated to insect breeding since 2012. The brand positioning statement of [Ingredient brand 2] is: our mission is founded on logic and rationality. We firmly believe in the power of insects as a sustainable food source, and our journey is guided by data, reason, and a commitment to find practical solutions for a changing world.

Ideological positioning: [Ingredient brand 3] is a company founded in 2016 after years of research on the potential of insect production for human nutrition. The brand positioning statement of [Ingredient brand 3] is: we are more than a brand; we are a bold movement, a worldview, and a clear statement of our beliefs. Our mission is to challenge the status

quo, reshaping how we approach food, sustainability, and our connection to the planet.

Warmth scale (Aaker et al., 2012): Thinking of this brand, I see it as warm and friendly (1 = 'totally disagree', 7 = 'totally agree').

Competent scale (Aaker et al., 2012): Thinking of this brand, I see it as competent and capable (1 = 'totally disagree', 7 = 'totally agree').

Ideological scale: Thinking of this brand, I see it as dogmatic and ideologic (1 = 'totally disagree', 7 = 'totally agree').

Table A1 Brand positioning statements: multiple comparisons (Bonferroni correction)

Measure	Warm statement		Competent statement		Ideological statement	
	M	SD	M	SD	M	SD
Warmth	4.58* [†]	1.7	3.42*	1.64	3.44 [†]	1.55
Competence	3.84*	1.36	4.71* [†]	1.66	4.16 [†]	1.6
Ideology	4.56*	1.56	4.44 [†]	1.58	5.22* [†]	1.54

Note(s): M and SD indicate mean and standard deviation, respectively.

Significant pairwise comparisons are marked by * and †

Source(s): Authors' own work

Appendix 3. Characteristics of the main study sample

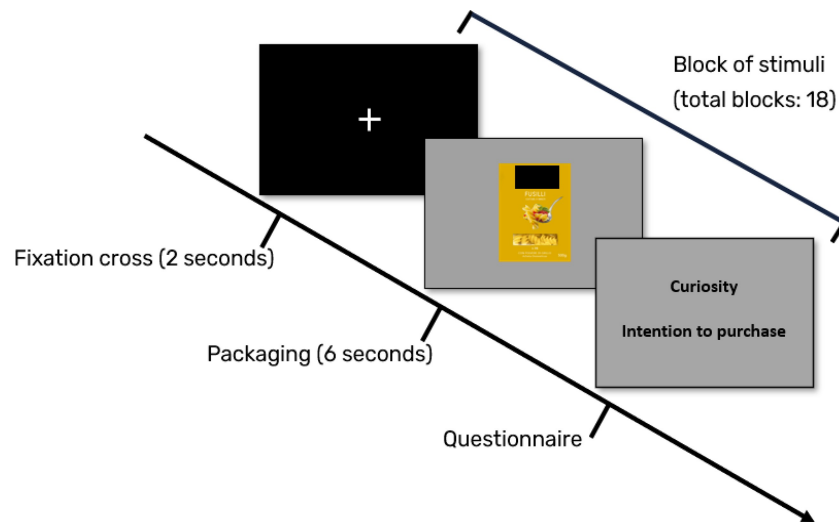
Table A2 Sample demographics (*n* = 70)

Variables	<i>N</i>	%
Sex		
Female	36	51.4
Male	34	48.6
Age		
18 – 25	52	74.3
26 – 30	2	2.9
31 – 40	4	5.7
41 – 50	5	7.1
> 50	7	10
Education		
Middle school	1	1.4
High school	15	21.4
University	51	72.9
PhD	3	4.3
Occupation		
Student	51	72.9
Employee	14	20
Self-employed	2	2.9
Entrepreneur	2	2.9
Unemployed	1	1.4
Previous experience of eating insects		
Yes	4	5.7
No	66	94.3

Source(s): Authors' own work

Appendix 4. Experimental design

Figure A1 Representation of the experimental blocks



Source: Authors' own work

Appendix 5. Example of stimuli from the main study

Figure A2 Example of ingredient and host brand alone and ingredient co-branded product packaging. The brand logos are not displayed due to copyright restrictions



Source: Authors' own work

Appendix 6. Neuroscientific experiment: scales reliability and validity

Table A3 Neuroscientific experiment: scales, internal consistency, and convergent validity analysis results

Reference	Measure	Cronbach's α	Composite reliability	Average variance extracted
(Gerrath and Biraglia, 2021)	<i>Curiosity</i> I am curious about this product			
(Lammers et al., 2019)	<i>Intention to purchase</i> How likely is it that you would buy the insect-based food product that you have just seen in the near future?			
(Acharya, 2021)	<i>Brand familiarity</i> I am familiar with this brand I am knowledgeable about this brand	0.73		
(Gwinner and Bennett, 2008)	<i>Brand fit</i> There is a close fit between BRAND A and BRAND B BRAND A and BRAND B have many similarities It makes sense combining BRAND A and BRAND B My image of insect-based food is consistent with my image of the cooperation between BRAND A and BRAND B	0.98	0.98	0.59

Source(s): Authors' own work

Appendix 7. Neuroscientific experiment: post-hoc validity checks

Table A4 Validity check: multiple comparisons (Bonferroni correction) of familiarity level

Brand		Mean difference (I – J)	SE	p _{bonferroni}	95% Confidence interval	
I	J				Lower limit	Upper limit
Host brand 1	Host brand 2	0.14	0.05	0.07	–0.006	0.292
	Host brand 3	0.16	0.06	0.175	–0.027	0.342
Host brand 2	Host brand 3	0.01	0.05	1.00	–0.143	0.172
Host brand 1	Ingredient brand 1	3.68	0.11	< 0.001	3.342	4.015
	Ingredient brand 2	3.81	0.08	< 0.001	3.576	4.052
	Ingredient brand 3	3.82	0.07	< 0.001	3.598	4.045
Host brand 2	Ingredient brand 1	3.54	0.14	< 0.001	3.115	3.957
	Ingredient brand 2	3.67	0.11	< 0.001	3.331	4.012
	Ingredient brand 3	3.68	0.11	< 0.001	3.345	4.012
Host brand 3	Ingredient brand 1	3.52	0.13	< 0.001	3.125	3.918
	Ingredient brand 2	3.66	0.1	< 0.001	3.36	3.955
	Ingredient brand 3	3.66	0.1	< 0.001	3.376	3.952
Ingredient brand 1	Ingredient brand 2	0.14	0.08	1.000	–0.094	0.365
	Ingredient brand 3	0.14	0.06	0.450	–0.053	0.339
Ingredient brand 2	Ingredient brand 3	0.01	0.04	1.000	–0.122	0.137

Source(s): Authors' own work

Appendix 8. ANOVA on eye-tracking and questionnaire variables from the main study

Table A5 Repeated measures ANOVA for the effects of curiosity, intention to purchase, fixation duration, revisits, peak velocity of saccades and brand fit measures

Measure	DF	Mean square	F	Unadjusted <i>p</i>	Adjusted <i>p</i> by H-F	Adjusted <i>p</i> by G-G	Partial η^2
Curiosity	1.623	1.390	6.627		0.004		0.088
Error	112.007	0.210					
Intention to purchase	1.500	3.649	10.130			< 0.001	0.128
Error	103.477	0.36					
Fixation duration	1.615	2724.208	37.063		< 0.001		0.349
Error	111.435	73.501					
Revisits	2	1.582	9.053	< 0.001			0.116
Error	138	175					
Peak velocity of saccades	2	34544.999	78.822	< 0.001			0.533
Error	138	438.268					
Brand fit	2	0.977	5.011	0.008			0.068
Error	138	0.195					

Source(s): Authors' own work

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