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Special Issue
Sensory Evaluation and Flavor Analysis in Food Science

Edited by
Dr. Katarzyna Świąder, Dr. Anna Piotrowska and Dr. Sylwia Żakowska-Biemans

MDPI

https://doi.org/10.3390/app15052795

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Is Cultured Meat a Case of Food or Technological Neophobia? On the Usefulness of Studying Social Representations of Novel Foods

Roberto Fasanelli [1], Ernesto Casella [1], Sofia Foglia [2,*], Sonia Coppola [3], Assunta Luongo [4], Giuliana Amalfi [5] and Alfonso Piscitelli [6]

[1] Department of Social Sciences, University of Naples "Federico II", 80138 Naples, Italy; roberto.fasanelli@unina.it (R.F.); ernesto.casella@studenti.unina.it (E.C.)
[2] LESDIT Ph.D. Program, University of Modena e Reggio-Emilia, 41121 Modena, Italy
[3] Department of Political Sciences, University of Naples "Federico II", 80133 Naples, Italy; sonia.coppola@unina.it
[4] Social Science and Statistical Ph.D. Program, University of Naples "Federico II", 80138 Naples, Italy; assunta.luongo@unina.it
[5] MG&L Ph.D. Program, University of Naples "Federico II", 80133 Naples, Italy; giuliana.amalfi@unina.it
[6] Department of Agricultural Sciences, University of Naples "Federico II", 80055 Naples, Italy; alfonso.piscitelli@unina.it
* Correspondence: sofia.foglia@unimore.it; Tel.: +39-3282092338

Highlights

What are the main findings?

- The study identified the structural elements of social representations of cultured meat, categorizing them into central core and peripheral schemes.
- Omnivores and vegetarians/vegans demonstrated differing representations and attitudes toward cultured meat, influenced by their dietary choices and beliefs.
- The research highlighted the role of cognitive processes and sensory perceptions in shaping opinions and willingness to consume cultured meat.

What is the implication of the main finding?

- The findings emphasize the importance of promoting balanced public discussions and informed policymaking regarding cultured meat to increase its societal acceptance.
- Differentiated outreach strategies may be needed to address the distinct concerns and preferences of omnivores versus vegetarians/vegans.
- Insights into sensory and cognitive anchors can guide the development and marketing of cultured meat to align more closely with consumer expectations.
- Considering socio-cultural variables and symbolic meanings associated with food is critical for the successful integration of novel food technologies into diverse communities.

Abstract: In recent years, many studies have examined "novel foods" from various perspectives; however, the theoretical framework of social representations has been underutilized in this research. This paper denotes an initial attempt to study the socio-symbolic impact of synthetic foods using this framework. Specifically, the study aims to explore how different audiences—such as carnivores versus vegetarians—interpret unfamiliar foods, focusing on a new food technology: synthetic meat. The research seeks to describe and compare the social representations of cultured meat that are co-constructed and shared among these social groups (n = 350). The study adopts the structural approach, analyzing both the structure and content of the social representations in question. This was achieved through a mixed-methods strategy, which included hierarchical evocation, a food neophobia scale, checklists, open-ended questions, and a projective sensory analysis technique. Data analysis employed both qualitative and quantitative methods. The main findings indicate the

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Academic Editors: Katarzyna Świąder, Anna Piotrowska and Sylwia Żakowska-Biemans

Received: 22 January 2025
Revised: 27 February 2025
Accepted: 28 February 2025
Published: 5 March 2025

Citation: Fasanelli, R.; Casella, E.; Foglia, S.; Coppola, S.; Luongo, A.; Amalfi, G.; Piscitelli, A. Is Cultured Meat a Case of Food or Technological Neophobia? On the Usefulness of Studying Social Representations of Novel Foods. *Appl. Sci.* **2025**, *15*, 2795. https://doi.org/10.3390/app15052795

significant roles of generative processes, cognitive polyphasia, and sensory anchors in the co-construction of social representations of cultured meat. The use of chemical-genetic objectification, metaphors, and clichés reflects ongoing debates about the possible implications of synthetic meat consumption for the environment and society. Our findings encourage consideration of social knowledge and cultural variables in food studies.

Keywords: central nucleus theory; generative processes; cognitive polyphasia; mixed methods; meat production; consumer acceptance

1. Introduction

Finding a term or expression that adequately captures the complexity of a concept while also summarizing its various meanings is often a challenging task. This challenge becomes even greater when the concept spans multiple domains of knowledge. To understand the essence and implications of cultivated meat, it is essential to explore its history, tracing its development from its early beginnings to the current state of the art.

It is important to note that, despite the enthusiasm surrounding the field, there is still no universally accepted term to describe cultured meat. Some of the most encountered names in the literature include cell-based meat, in vitro meat, lab-grown meat, artificial meat, and clean meat.

1.1. The Definitional Question

The name of "the thing" is relevant in the context of cultured meat, where its terminology can impact market success. The challenge lies in its ontological identity, as Stephens et al. [1] note, pushing us to rethink traditional categories of understanding meat. Consumers might identify as either zoophagic, acknowledging the animal, or sarcophagus, perceiving it as an abstract product. This distinction could influence their willingness to switch to a cultured meat diet.

Producers often frame cultured meat as equivalent to traditional meat, emphasizing benefits like reduced environmental impact and animal welfare, thus distancing it from the label of "alternative" assigned to plant-based products. However, this narrative leverages ethical values tied to the shortcomings of traditional meat supply chains [2].

Hibino et al. [3] provide a critical view of "cultured meat", using the whole-parts framework to argue that its appeal stems from traditional cultural practices. They assert that for meat to be meaningful, it must come from a whole that has died. Thus, cultured meat lacks this essential connection. Furthermore, they highlight that current perceptions of meat have diverged, with some consumers viewing it merely as a commercial product while others see it tied to animals within an ecosystem.

In the early 2000s, NASA and the Disembodied Cuisine project referred to cultured meat as "in-vitro edible muscle protein" and "semi-living steaks", respectively. The term that gained widespread acceptance is "in-vitro meat", which pertains to laboratory research and dominated discussions from 2005 to 2011. In 2016, during the "European Science Foundation Exploratory Workshop on In-vitro Meat", the term "cultured meat" was proposed for broader usage. This suggestion sparked controversy, as it classified the meat produced and those involved in its handling, creating distinct identity boundaries. Researchers preferred a scientific nomenclature that did not conform to marketing influences.

Later, in late 2016, the Good Food Institute began promoting the label "clean meat". By 2018, the U.S. company Memphis Meats (which became UPSIDE Food in 2021) engaged with U.S. regulators using the term "cell-based meat", believing it would best balance the interests of various stakeholders, including cultured meat companies and farmers [4].

The term "cultured meat" plays a crucial role in its acceptance among consumers, who may identify with either the animal it comes from or view it as an abstract product, influencing their willingness to adopt a cultured meat diet. Producers often frame cultured meat similarly to traditional meat, highlighting benefits like lower environmental impact and improved animal welfare, while distancing it from "alternative" plant-based products. Hibino et al. argue that the appeal of cultured meat is rooted in traditional cultural practices, asserting that meat should come from an animal that has died. They note that perceptions of meat have evolved, with some seeing it as a mere product and others as an integral part of an ecosystem. Terms like "in-vitro edible muscle protein" were introduced earlier in projects by NASA and during a 2016 workshop, which led to the establishment of "cultured meat" amid debates over identity boundaries. The Good Food Institute later promoted "clean meat", while Memphis Meats (now UPSIDE Food) adopted "cell-based meat" to ease stakeholder concerns. Bonny et al. discussed a typology for distinct types of artificially produced meat, emphasizing plant-based alternatives, genetically modified options, and cultured meat grown from tissues and cells.

Bonny et al. [5] presented a typology of artificially produced and theoretically producible meat for consumption, categorized by the technology used. They emphasized substitute products made from alternative protein sources, specifically highlighting plant-based meat alternatives (PBMAs), including plants and mushrooms; meat derived from genetically modified organisms (GMOs); and meat grown from tissues and cells in a laboratory setting—referred to as cultured meat.

For Mateti et al. [6], artificially produced meat includes the subgroups "cultured meat" and "meat analogs", which branch further into "in-vitro meat" and "GMO" for the former, and "vegan meat" for the latter.

A report by FAO and WHO [7] discusses the importance of terminology, emphasizing the need for clear, consistent nomenclature that all stakeholders can agree upon. Such clarity is vital not only because terminology can influence consumer perceptions and behaviors regarding cultured meat, but also to facilitate effective communication among policy authorities, potentially preventing confusion in regulatory discussions. Table 1 in the cited report illustrates the survey results on the primary terms or designations for cell-based foods within four domains. Interestingly, the media has generated a considerable number of unique names that are not reflected in other fields. In the scientific community, the terms most used are "cultured", followed by "cell-based", "in-vitro", "artificial", and "cellular".

Bonny et al. [5] presented a typology of artificially produced and theoretically producible meat, categorized by technology. They focused on substitute products from alternative protein sources, particularly plant-based meat alternatives (PBMAs) like plants and mushrooms, meat from genetically modified organisms (GMOs), and cultured meat grown from tissues and cells in a lab.

Mateti et al. [6] categorize artificially produced meat into "cultured meat" (which includes "in-vitro meat" and "GMO") and "meat analogs" (which includes "vegan meat"). A FAO and WHO report [7] highlights the necessity of clear terminology for effective communication among stakeholders and regulators, as it influences consumer perceptions. Table 1 of that report shows survey results of common terms for cell-based foods, noting that the media has coined many unique names. In the scientific community, the most frequently used terms are "cultured", "cell-based", "in-vitro", "artificial", and "cellular".

Table 1. Sample characteristics (n = 295).

Variable		Freq.	%
Gender	Male	115	39.0%
	Female	167	56.6%
	Nonbinary/Other	13	4.4%
Gen	Boomers	17	5.8%
	Gen X	38	12.9%
	Gen Y	82	27.8%
	Gen Z	157	53.2%
	Gen Alpha	1	0.3%
Eating style	Omnivore	243	82.4%
	Vegetarian/Vegan	49	16.6%
	No choice	3	1.0%
Political orientation	Apolitical	78	26.4%
	Center-right	32	10.8%
	Center-left	53	18.0%
	Extreme-left	102	34.6%
	No choice	30	10.2%
Educational background	Primary School	1	0.3%
	Junior High School	31	10.5%
	High School	115	39.0%
	Bachelor's Degree	56	19.0%
	Master's Degree	68	23.1%
	Ph.D.	24	8.1%
Total		295	100%

The regulatory landscape for cell-based products shows slight variation, reflecting a lack of established regulations in many countries as of 2023. Until February 2022, the Singapore Food Agency (SFA) was the only entity to include specific guidelines for cell-based food products in its safety certification process, requiring clear terms like "cultured", "cultivated", and "cell-based" to indicate their cellular origin. The SFA also prohibits labels that promote an idealized narrative undermining the safety of competitors [8]. However, this regulation does not eliminate the issue, as companies can still exploit the positive perception of the term "meat" [9].

In their study, Bryant and Barnett [10] emphasize the influence of names on consumer perceptions. A dish's name can evoke its cuisine of origin and suggest the recipe's originality, while food labels shape the perceived characteristics of products. For instance, 'organic' foods are often seen as healthier but less indulgent. The researchers show that attitudes and intentions toward cultured meat vary based on its naming associations. Each name carries specific connotations that impact consumer perception. However, distinctions between in vitro and traditional cultured meat may become less significant over time, like the perception of 'artificial ice' versus 'classic' ice. Consumer opinions pose a significant barrier to the marketing of cultured meat. The authors [10] highlight that the term "animal-free meat" can confuse consumers, often linking it to veganism and causing negative perceptions among meat-eaters. In contrast, "clean meat" elicits more positive associations. Their study illustrates that the terminology used influences attitudes and actions, but there is not a direct correlation between beliefs and behaviors; for instance, concerns about animal welfare may not lead to vegetarianism. They frame this through Social Representation Theory, where participants reinterpret the unfamiliar concept of cultured meat into a more acceptable context.

Asioli et al. [11] conducted a study with 625 U.S. respondents over eighteen, revealing that preferences and marginal willingness to pay (WTP) for chicken vary based on the terminology used for in vitro meat. They found that in vitro chicken was valued less than conventional chicken, with "cultured" having the least negative impact compared to "artificial" or "lab-grown".

Additionally, language barriers can affect terminology; direct translations may change meaning and influence acceptance levels.

1.2. Narratives in the Cultivated Meat Debate

The cultured meat industry is driven by start-ups, with research shifting from academic circles to entrepreneurial ventures, influencing funding and narratives [12]. Supporters highlight the health benefits of cultured meat and its potential for environmental sustainability, food justice, and animal welfare, attracting investment and fostering optimism [13].

Sexton et al. [13] argue that cultured meat can address global challenges, improve hygiene, and promote animal ethics, while critics question its competitiveness, labeling it "Frankenfood", and highlighting its economic impact on traditional sectors. There is a pressing need for a clear legal definition of cultured meat to navigate these criticisms. The debate revolves around themes like "real vs. fake" and "tradition vs. progress", with both sides aiming to position themselves favorably.

Life cycle assessments (LCAs) may suggest the environmental superiority of cultured meat but often overlook food system complexities. Focusing solely on the cultured meat vs. conventional meat dichotomy limits the exploration of more sustainable alternatives, such as reducing overall meat consumption [14]. A critical analysis that goes beyond this binary is essential to address the complexities of the food system and seek genuinely sustainable solutions. Solutions are essential.

Cultured meat companies promote compelling narratives that highlight their potential to revolutionize the food system. However, realizing these promises depends on overcoming several challenges and navigating uncertain future scenarios.

To succeed, companies must achieve a scale that allows them to compete with and replace the traditional meat market. The industry faces two main challenges:

1. Technical: Reproducing the animal's biological environment in vitro, including the necessary stimuli for cell multiplication and differentiation.
2. Economic: Reducing production costs and ensuring profitability.

These challenges are inextricably intertwined. Researchers are focused on replicating the organoleptic properties of conventional meat—such as color, flavor, and texture—to address consumer reluctance. Companies are investing considerable effort into perfecting their technologies to replicate these properties [15,16], as well as mechanical properties like water retention [17], which are characteristic of traditional meat.

However, reproducing the organoleptic and nutritional properties of conventional meat in vitro presents several difficulties:

- Color: Myoglobin, responsible for the red color of meat, is absent in cultured meat due to culture conditions. Solutions include adding additives or coloring agents.
- Flavor: The flavor of meat is a result of chemical reactions during cooking, influenced by the presence of fat and post-mortem processes. Reproducing these reactions in vitro is complex.
- Texture: The texture of meat depends on several types of tissues but cultivating these tissues in the same environment in vitro is suboptimal.
- Nutritional properties: There is limited information available regarding the protein content, amino acid composition, and protein digestibility of cultured meat.

Optimizing large-scale production involves several factors:

- Cell selection: Muscle stem cells (MuSCs) are preferred for their ease of isolation and compatibility with myogenesis.
- Culture media: The culture media constitutes a sizable portion of the production cost. Eliminating fetal bovine serum (FBS) poses both ethical and economic challenges.
- Scaffolds: These three-dimensional structures provide mechanical support for cell growth. Removing non-edible or biodegradable scaffolds is an additional step.
- Bioreactors: Necessary for large-scale production, these must replicate the animal's environmental conditions.

Cultured meat also poses several health and safety issues, including the risk of bacterial or viral contamination during production, the need for antibiotics to prevent contamination, the use of additives, and the potential carcinogenicity of cultured cells.

Regulations concerning cultured meat are currently being developed. The Singapore Food Agency has approved the marketing of cultured meat, while the European Union considers it a "Novel Food".

However, the availability of cultured meat does not guarantee consumer acceptance. Studies on consumer acceptance show variable results influenced by the wording of applications and the absence of an established market. Familiarity, taste, and price are key determinants of acceptance.

In recent discussions about the meat supply chain, the environmental, moral, and health impacts have garnered increased attention, especially after the COVID-19 pandemic highlighted vulnerabilities in the industry. A study shows that animal products occupy 83 percent of arable land and contribute to 57 percent of food-related pollution but only provide 37 percent of protein and 18 percent of calories. Furthermore, livestock is responsible for 20 percent of anthropogenic greenhouse gas emissions and consumes significant land and resources [18,19].

Efforts to address these issues include supply-side initiatives, such as the Common Agricultural Policy (CAP), which has proven ineffective in enforcing environmentally friendly practices and animal welfare standards. Additionally, attempts to influence consumer behavior face cultural resistance, as meat consumption is deeply embedded in social norms and values. As demand for meat is expected to rise, especially in developing countries, alternative protein sources, including cultured meat, are emerging as potential solutions, though widespread availability is still a challenge [19].

Based on two of the most comprehensive systematic reviews conducted by Bryant and Barnett [20] and, more recently, by Hanan et al. [21], only a tiny percentage of the hundreds of articles reviewed explicitly referenced established theories. This finding suggests that many investigations lack a cohesive theoretical foundation. According to the authors, the absence of a theoretical framework in these studies is a significant concern, as it impedes the advancement of the field.

Notably, the aforementioned reviews do not contain any studies on the social representations of cultivated meat. The exception is a 2015 article by Marcu et al., "Analogies, metaphors, and wondering about the future: Lay sense-making around synthetic meat", published in *Public Understanding of Science* [22]. This article explores how the public interprets synthetic meat, viewing it as a biotechnological innovation through the lens of social representations. Its objective was to understand how scientific knowledge is translated into common understanding and which anchoring mechanisms are employed to make sense of this new technology.

1.3. Theoretical Framework

This paper utilizes the Theory of Social Representations (TSR) as a theoretical framework to empirically examine the sense-making configurations related to cultured meat among specific subgroups categorized by variables such as age, eating habits, and education level. The aim is to assess their predictive validity, though not determinism, regarding potential purchasing behavior.

Introduced by Serge Moscovici in 1961 [23], the Theory of Social Representations (TSR) examines the transition of knowledge from reified universes—those that are scientific and deterministic—to consensual universes, which are more flexible and individualized. This transition occurs through social representations (SRs). TSR serves as a common-sense theory that explains how communities represent and share knowledge.

Social representations are dynamic systems of values, concepts, and practices that guide behavior and social interaction. This involves examining the knowledge and representation processes in relation to the dynamic integration of social and cultural elements that shape the reference universe from which social subjects develop their posture and experiences [24]. Rather than being rigid images, social representations function as living interpretive grids that continuously reshape perceptions, attribute meaning to the unexpected, and define what is considered normal or expected.

The social dimension of TSR emphasizes that social representations are not static or solely individual; they emerge through collective interactions and processes of symbolic exchange. Social representations theory (SRT) serves as a powerful tool for studying the social acceptability of lab-grown meat. It provides a framework for understanding how people represent, share, and negotiate meanings surrounding new concepts and technologies. Drawing inspiration from the Central Nucleus Theory [25] and its structural approach [26], we will identify the key elements that characterize social representations of cultured meat, including perceptions of naturalness, food safety, sustainability, ethics, and technological innovation. These elements will play a crucial role in determining the stability and significance of the representation.

Additionally, we will explore the more flexible and contextual opinions, beliefs, and attitudes that surround these core elements, such as taste, price, and cultural implications. Particular attention will be given to the generative processes of this representation, specifically:

1. Anchoring: This process will help us understand how consumers assimilate the idea of cultured meat into pre-existing categories, such as "natural food" or "technological product". It will provide insight into how people integrate this new concept into their everyday experiences. The use of terms like "clean meat" or "synthetic meat" significantly influences acceptability by linking innovative technology to familiar concepts, whether focused on ethics and health or artificiality.
2. Objectification: This aspect will analyze how cultured meat becomes tangible through images, narratives, and symbols, such as those used in advertising, packaging, and media representations. Positioning cultured meat as a product "similar to traditional meat" could enhance its perceived acceptability.

It is equally important to recognize the coexistence of differing representations of cultured meat, such as viewing it as a sustainable innovation versus perceiving it as a threat to culinary traditions. Identifying these perspectives will enable us to explore cognitive polyphasia, where individuals or groups simultaneously use diverse kinds of knowledge and rationales [27]. Additionally, we need to understand how various groups react to the food technology in question.

Lastly, it is crucial to analyze how competing narratives—whether promoted by corporations, environmental activists, or critics of biotechnology—shape public opinion. This study aims to examine the shared representations within specific subgroups (e.g., vegetarians, environmentalists, and traditionalist consumers) and how these representations influence the communication and acceptance of cultured meat.

Jean-Claude Abric [28] defines social representations as organized sets of information, opinions, attitudes, and beliefs about a particular object. These representations are influenced by the values of the socio-ideological system and the group's history, forming a key part of their worldview. Abric emphasizes that social representations consist of both content and structure, making it essential to study the organization of this content to fully understand the representation. Starting from these premises, the present contribution aims to study the social representation of cultured meat in the described approach, which means discovering the constitutive elements of its structure (central core and peripheral schemes) and its content (opinions, attitudes, intentions, and generative processes).

The following research questions summarize the core proposals:

(1) Do groups of participants belonging to different social categories produce different representations of cultured meat?
(2) Which aspects of the social representation of cultured meat are more and less shared among the groups of participants?
(3) What is the role of the anchoring process on perceived sensory properties and the willingness to consume cultured meat?

2. Materials and Methods

2.1. Participants

To provide an answer to our research questions, we conducted a fact-finding/exploratory survey on a non-probabilistic sample of Italian consumers. The inclusion criterion was represented by having at least heard of the introduction of cultivated meat into human nutrition. A convenience sample of 295 participants completely satisfied the inclusion criterion by answering an anonymous web questionnaire (CAWI). We interviewed 350 participants; however, only 295 of these individuals completed the entire questionnaire. The incomplete responses (n = 55) were excluded from the final analyses due to missing data on key variables. We asked all participants to fill out an online form and recruited them using social media (e.g., Facebook, WhatsApp, Reddit, Telegram, or Twitch channels) and mailing lists (e.g., University of Naples student lists). We are fully aware of the inherent constraints of the online surveys. The CAWI technique has limitations, related to coverage. While Internet use is growing, it is not universal, which can exclude non-digitized populations and introduce bias in survey results. Additionally, web questionnaires require reading skills, potentially leaving out uneducated individuals, foreigners, and those with disabilities, such as the blind. Despite these challenges, CAWI offers significant cost savings, and it was an easy decision for us. We collected data from January 2024 to June 2024 and obtained written informed consent from all participants before participating in the research process. According to guidelines laid down in the Ethics Code of the Italian Association of Psychology, we conducted this study coherently with the Declaration of Helsinki and the European Code of Conduct for Research Integrity. Demographic characteristics of the sample are reported in Table 1.

To address our research questions and for space considerations, this paper focused exclusively on comparing omnivores with vegetarian and vegan subsamples.

2.2. Data Construction Strategies

We chose a mixed-method approach to discover the structure and content of the social representation of 'cultured meat' for each social group, following the structural approach [29–35]. Within this theoretical framework, to arrive at the significant elements of the social representation of 'cultured meat' and to reconstruct the organization of these elements, we chose the method of hierarchical evocation [28,36,37]. In other words, we asked participants to respond to a task of free association and hierarchization, as provided by Vergès' method. This is a free association task starting with an inductor term, which has the dual advantage of combining the frequency dimension of the terms and the importance attached to them by the subjects. In the initial section of the research instrument, we asked each participant to list the first five nouns that meat to mind in response to the question 'cultivated meat' and to rank these nouns according to their perceived importance. We supplemented the free association task with five open-ended questions to increase the clarity and relevance of the data and reduce any potential lexical ambiguity. These questions encouraged participants to explain their word choices in writing. The answers provided valuable insights into the meanings and interpretations of each word, including the rationale behind the participants' choices. Synthetically, our research materials consisted, for each sub-sample of participants, of a corpus of free-associated words, a corpus of open-ended responses for each associated term chain, and a corpus of information from all other items related to descriptive variables and knowledge of cultivated meat. The next three sections of the questionnaire focus on identifying the content of the representation. In the second section, participants were asked to answer semi-structured and structured questions based on the following dimensions: prior knowledge of the item, information sources, and individual opinions about it. The third section examined the attitudinal component of the social representation studied, using both an instrument validated by Bäckström, Pirttilä-Backman and Tuorila in 2004 [38] and a custom instrument inspired by the one validated by La Barbera et al. in 2020 [39,40].

The first scale, the Social Representation of New Foods Questionnaire (SR_NFQ) [38], consists of 27 statements addressing various aspects related to novel foods through five dimensions: suspicion of novelty, adherence to technology, preference for natural foods, eating as pleasure, and eating as necessity. Participants rated each item on a 7-point Likert scale, ranging from 'strongly disagree' to 'strongly agree'. The second scale, the Cultured Meat Attitude Questionnaire (CuMAQ), comprises ten statements focusing on specific aspects of neophagy based on three dimensions: disgust (CuMAQ-D), interest (CuMAQ-I), and animal feeding (CuMAQ-F). Likewise, the items of this scale were rated on a 7-point Likert scale from 'strongly disagree' to 'strongly agree'. As part of the study, two further scales specifically designed to measure the participants' intention to eat cultured meat (CuM_EI-G) in general and their willingness to eat meat cultured from specific animals (cow, fish, chicken, and pork) (CuM_EI-S) were administered. At the end of these batteries, a special item directly measures the respondents' willingness to buy cultured meat (WtB). The answers were collected using a 7-point scale ranging from 'strongly unlikely' to 'strongly likely'. The fourth section of the research instrument focused on what we call Projective Sensory Experience (PSE). The study of food consumption behavior is moving from quantitative methods, like numerical questionnaires, to qualitative techniques that uncover deeper influences, such as open-ended questions and projective methods [41]. Projective methods, which use ambiguous stimuli like words or images, can provide personal insights. Mesias and Escribano [42] highlighted five projective methods for market research: association, construction, completion, expressive tasks, and order of choice, emphasizing that combining these can enhance understanding of consumer behavior [43]. However, studies using these techniques remain limited. Notable research includes word association and story completion to investigate consumer perceptions of spreadable cheeses and gluten-free products, as well as shopping lists and word association for fermented milk, revealing consumer purchase profiles and perspectives [44]. Research in sensory cognition indicates that imagined experiences can activate similar neural circuits as real perceptions. For instance, Spence and colleagues [45] argued that recent neuroimaging studies show that creating new learned associations between auditory or verbal stimuli and visual stimuli leads to improved cross-modal connectivity. Consequently, one component of a multisensory pair (such as a word) can activate the association with the other component (like taste). These studies suggest that imagination can partially replicate multisensory experiences, although with lower quality and intensity. Furthermore, familiarity with specific food stimuli and cultural background can influence the accuracy of these imagined representations, highlighting a significant subjective aspect.

The ecological validity of imaginal perceptions is debated. While some studies indicate that imagination can reveal insights into sensory reactions and food preferences, the absence of physical input—such as taste, aroma, and texture—limits the richness of the sensory experience. Therefore, results from projective techniques should be interpreted cautiously. Imagined perceptions may not accurately represent reactions in real-tasting situations, potentially introducing biases from cultural preconceptions and prior knowledge.

To assess the respondents' anticipated taste sensations with respect to cultured meat and explore the specific processes of anchoring and objectification, we developed a two-stage instrument. In the first phase, we asked the participants to imagine tasting a meat dish and to evaluate the following taste and smell sensations, based on the work of Donadini et al. [46], on a scale from 1 (imperceptible) to 10 (very perceptible): savoriness, tendency to bitterness, acidity, sweetness, spiciness, aroma, unctuousness, succulence, tendency to sweetness, fatness, and persistence. In the second phase, to understand how positive or negative stimuli influence perceptions, we asked the participants to identify, using a specific checklist, which taste-olfactory sensation they found most and least bothersome. This strategy aimed to discover the type of 'sensory anchorage' that participants activate when faced with a dish of cultured meat. This study represents a preliminary effort to explore synthetic foods using the social representations framework. However, the absence of actual tasting data limits the interpretation and generalizability of the findings. Future research could incorporate direct tasting experiences when legally permissible to compare imagined perceptions with actual ones.

While techniques based on imagined perceptions hold promise, it is crucial to acknowledge their methodological limitations and consider their impact on ecological validity. By addressing these concerns, we can enhance theoretical discussions and the design of future studies on novel foods and innovative technologies.

The questionnaire concludes with the collection of the participants' descriptive characteristics, including age, gender, occupation, education, and eating habits.

2.3. Statistical Methods

The collected data were initially recorded using spreadsheet software (Microsoft® Excel® 2020, Version: v. 2501) and then used to perform both the analysis of the structural elements of the studied social representation, as well as the statistical analysis of the SR's content, operationalized in the following scales: SR_NFQ, CuMAQ, CuMAQ-D, CuMAQ-I, CuMAQ-F, CuM_EI-G, CuM_EI-S, and PSE.

All analysis will be presented splitting participants into two sub-groups: Omni (omnivores), and Veg (vegetarians and vegans).

We first treated the terms evoked by the participants with lexical and categorical analysis. In the lexical phase, we lemmatized free evocations and then aggregated them based on the synonymy criterion to obtain clusters of terms substantially coincidental with the manifest meaning. Therefore, using a semantic criterion, terms were further aggregated, starting from their justifications. Each of the obtained clusters was associated with a new label. Every label was identified using, as a selection criterion, the high semantic proximity, and frequency of occurrence of every term aggregated inside of it. Five independent judges completed the whole analytical process. Each judge worked first individually; afterward, they discussed their analysis and agreed on a shared position. We chose an inclusion threshold for the obtained categories, which allowed us to process only those containing words provided by at least 5% of participants. We then processed the obtained data by the software IRaMuTeQ (Version: 0.8 alpha 7) (R environment's graphical interface) created by Pierre Ratinaud [47]. A prototypical analysis was allowed to reach the elements, which enabled us to hypothesize the central core and the corresponding periphery configuration of the social representation of "cultivated meat" for each participant group. This analysis's output appears as a "double entry" table, where elements can be interpreted from the position they have in the four cells. Specifically, the first one (upper left cell, high frequency, and rank) groups the most frequent and essential elements, delimiting the central nucleus area. In the second cell (upper right, high frequency, and low rank), there are the most important peripheral elements ("first periphery" of the nucleus), which give information useful to reconstruct better the social practices related to the SR's object. In the third one (lower left cell, low frequency, high rank), the elements (of contrast) could configure a nucleus of an SR shared by a minority or be complementary to central elements. The last cell (lower right, low frequency, and low rank) coincides with the area of the "second periphery", constituted by the elements less present and less important in the structural organization investigated. A prototypicality analysis outlines the "centrality hypothesis", which suggests a possible internal structure within the representational field. To further investigate and confirm the centrality of an element alongside its high cognitive salience, Sutrop's salience index was calculated. This index is a unique measure that combines the occurrence of an item with its perceived importance as rated by respondents.

Sutrop [48] defines salience operationally as the ratio of the frequency (F) of a term to the product of the average degree of importance (mP), which is the weighted average of the importance attributed to the term on a given scale, multiplied by the number of respondents (N):

$$S = F/(N\ mP).$$

The Sutrop index yields a value between 0 and 1, with lower values indicating lower levels of salience/centrality and higher values indicating higher salience/centrality.

In compliance with the full set of techniques afforded for this type of data, we also treated hierarchized evocations with a similarity analysis. This analysis (a particular type of Network Analysis) was also supported by the software IRaMuTeQ, which has the advantage of better showing the organizational structure of the significant elements of every social representation. The procedure consists of elaborating a matrix of similarity starting from the selected index, which depends on the relationship's nature among the considered variables. In our case, we selected the Chi-squared index. We selected this index because the software algorithm utilizes "evocation x evocation" contingency matrices to assess the similarity and dissimilarity between items and item aggregates. Among the available indices in the software options, the Chi-square test appeared to be the most suitable for this type of data set. The output of this analysis consists of a graph on which the social representation's structural elements are shown with various kinds of links (more or less marked). The selected threshold expresses the relations (and their strength) between structural elements and their network. We elaborated the final graphs using the "maximum tree" logic to provide the best-summarized information about the clustering elements. In the listed figures, the colorful vertices' size is proportional to the category frequency, and the thickness of the edges indicates the Chi-squared index strength of the cognemes link.

Moreover, for all the scales, we analyzed their sub-dimensions, and the reliability was assessed with Cronbach's alpha criteria (Table 2). To obtain the individual score for the sub-dimensions of each scale, we calculated the sum of the scores of each item belonging to the sub-dimensions considered. Statistical analyses were carried out in SPSS® V. 29.0.1.0 software.

Table 2. Cronbach's alpha.

Scale	A	Items
SR_NFQ	-	-
1. Suspicion toward novelty	0.883	8
2. Adherence to technology	0.830	6
3. Adherence to natural food	0.663	5
4. Food as pleasure	0.789	4
5. Food as necessity	0.725	4
CuMAQ	-	-
CuMAQ-D	0.948	5
CuMAQ-I	0.884	3
CuMAQ-F	0.845	2
CuM_EI-G	-	-
General intention to consume	0.907	4
CuM_EI-S	-	-
Specific intention to consume	0.963	3

3. Results

3.1. Representations' Structure

3.1.1. Prototypical Analysis and Cognitive Salience

In this section, we will present results useful for hypothesizing both the composition of the core social representation under study and the patterns of its periphery. The analysis of prototypicality (Table 3) indicates that the categories Sustainable (Freq. 43; R.I. 1.9), Innovation (Freq. 39; R.I. 2.6), and Future (Freq. 36; R.I. 2.7) represent the central core of the omnivores' representation.

Table 3. Omni prototypical analysis.

Freq./R.I.	Rank of Importance $\leq$ 2.85		Rank of Importance > 2.85	
Freq. $\geq$ 20.3	Sustainable Innovation Future	43–1.9 39–2.6 36–2.7	Artificial Laboratory	34–2.9 24–3.5
Freq. < 20.3	Chemical Environment Not_Natural	20–2.6 19–2.5 17–2.3	Progress Curiosity Cells New Costs	19–2.9 18–3.5 18–3.1 18–3.3 18–3.2

Cognitive salience indices support the positions identified by prototypicality for the central core cognemes. Among omnivore participants, the most prominent elements of the social representation of cultivated meat are Sustainability (SI 0.101), Innovation (SI 0.067), and Future (SI 0.059).

The Veg subsample consists of all respondents who identified as practicing vegetarianism, veganism, or a similar eating style by reducing their meat consumption. This group includes 49 individuals, representing 16.6 percent of the total. The small sample size of Veg raises the likelihood of Type II errors, which occur when a real effect is not detected. This means there may be significant differences between vegetarians and omnivores that the study failed to identify due to low statistical power. For instance, while we noted some significant differences in sensory perceptions between the two groups, subtler differences might have gone undetected because of the limited number of vegetarian participants. Veg's sample dimension also diminishes statistical power, making it more challenging to confirm the research hypotheses. Even when noteworthy results emerged, they were approached with caution. Small samples are more prone to random variability, meaning these results could be due to chance rather than an actual difference between the groups. This complicates efforts to draw precise conclusions about group differences. More advanced statistical techniques, such as analysis of variance (ANOVA), become less reliable when applied to small samples. This limitation restricted our ability to explore complex interactions between variables. In summary, the small sample size of vegetarians limited the generalizability of the results and heightened the risk of Type II errors affecting the interpretation of significant findings. Therefore, we needed to interpret the results cautiously and consider these limitations when concluding the perceptions of cultivated meat among vegetarians and omnivores. Future studies (which are currently in planning) should include a larger sample of vegetarians to enhance the validity and generalizability of the findings.

Table 4 presents the results of the prototypicality analysis related to these respondents. According to the centrality hypothesis, the core elements of this representation include Sustainable (Freq. 17; R.I. 1.6), Ethics (Freq. 11; R.I. 1.8), and Science (Freq. 6; R.I. 2.8).

Table 4. Veg prototypical analysis.

Freq./R.I.	Rank of Importance $\leq$ 2.9		Rank of Importance > 2.9	
Freq. $\geq$ 4.67	Sustainable	17–1.6	Future	16–3.1
	Ethics	11–1.8	Progress	13–3.1
	Science	6–2.8	Innovation	12–3.2
Freq. < 4.67			Artificial	4–3.5
	Hunger	4–2.5	Cells	4–4.2
	Farms	2–2.5	Experimentation	3–3.7
	Anim_Protect	2–1.5	Curiosity	3–4.0
			Laboratory	3–3.3

When comparing the prototypicality analysis with Sutrop's cognitive salience indices, we find that only two themes, Sustainability (S. 0.216) and Ethics (S. 0.124), occupy the top positions. Following these, the next three items fall into the peripheral zone: Future (Freq. 16; R.I. 3.1; S. 0.105), Progress (Freq. 13; R.I. 3.1; S. 0.085), and Innovation (Freq. 12; R.I. 3.2; S. 0.076). These findings provide stronger support for the hypothesis that Sustainability and Ethics are the core structuring elements of Veg's SR of cultured meat.

3.1.2. Similitude Analysis

In this section, we will present useful results for confirming both the centrality of core elements and their interrelationship with the most meaningful cognitions of social representation's internal structure. The previously advanced centrality hypothesis for the central core of the omnivores' representation is positively confirmed by the graph in Figure 1, which depicts the butterfly structure of the RS with two significant bipartitions.

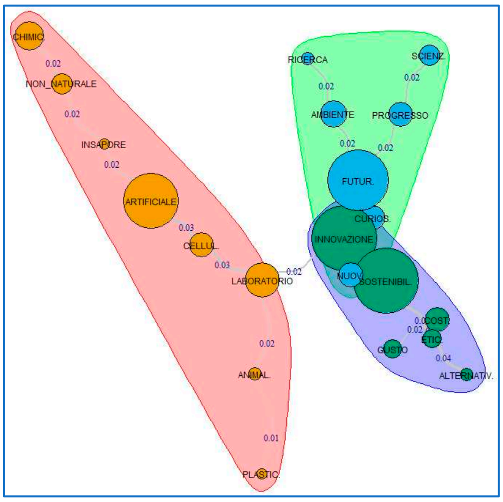

Figure 1. IRaMuTeQ output: Omni Similitude Analysis.

In the cluster on the left, the cogneme Artificial emerges prominently, identified as a strong candidate for the first periphery based on prototypicality analysis. This is followed by Laboratory, the cogneme with the highest χ^2 *p*-value (0.07) in its cluster, which also serves as a bridge to the other partition. On the opposite side, the cognemes Innovation, Sustainability, and Future are central, with the first two forming part of the same cluster.

Notably, Innovation has the highest number of connections to other constituent elements. Cultured meat is widely recognized as an innovative product due to its novel and unprecedented nature: "I guess it is something innovative in that it has never been produced before" (ID_237 (Participant identifier)). This innovation stimulates curiosity among regular meat consumers, who express interest in assessing its taste and texture firsthand: "I am very curious to personally assess the real 'similarity' in taste and texture of cultured meat compared to what we are used to" (ID_105). Additionally, there is curiosity regarding the public's reception of the product: "Curious both of the taste and from the mass response" (ID_279), and its long-term impact: "Curiosity to taste and see a positive change in the world of sustainability" (ID_073).

Cultured meat is also perceived as a milestone in scientific progress: "Certainly, it is a scientific level breakthrough" (ID_017). However, it is acknowledged that significant development remains necessary: "Because there is still much to be done to make the product more compelling to the 'carnivore' market" (ID_261), particularly through further research: "Research is a foundational step to synthesize meat in useful quantities at marketable prices" (ID_287). Beyond its innovative production, cultured meat contributes to the broader mission of environmental sustainability: "I think cultured meat can significantly reduce environmental impacts" (ID_297). It is also framed as a solution to ethical concerns, notably through the reduction in intensive livestock farming: "Synthetic meat could enable a reduction in intensive livestock farming with favorable ethical implications" (ID_264).

From the adoption perspective, taste is perceived both as an asset and a challenge. On one hand, production control allows for precise customization of flavor profiles: "Cultivation allows for the accurate dosing of various components, enabling adaptation to different tastes" (ID_105). On the other hand, skepticism persists regarding cultured meat's ability to replicate the sensory characteristics of conventional meat: "Synthetic meat can never have the texture and taste of meat from a real animal" (ID_296).

In contrast, the left-hand partition highlights cognemes associated with the artificial and non-natural aspects of cultured meat. The laboratory, as the site of production, is seen as a controlled environment that ensures safety: "Because processed in the lab, the meat does not have germs or at least not as much as regular meat" (ID_291). However, it also evokes concerns about potential additives: "The word synthetic meat makes me think of added chemical compounds" (ID_154), and health risks: "Of course, it will be full of harmful substances" (ID_177). Furthermore, there is a broader unease regarding synthetic food: "In the long run, we become what we eat; if we eat synthetic products, it certainly cannot do any good" (ID_012).

In the collective imagination, the laboratory often represents a space where natural substances are manipulated and lose their authenticity: "Because they are grown in the laboratory, from the 'extracts' of animals in bioreactors" (ID_121). This reinforces the perception of cultured meat as less genuine and less flavorful: "I cannot imagine it will taste the same as the normal one; I imagine it to taste more bland/artificial" (ID_219).

Free associations further reveal the respondents' tendency to anchor and objectify their understanding of cultured meat in sensory-gustatory terms, even when not explicitly prompted to do so.

The similarity analysis graph related to the Veg subsample (Figure 2) reveals a linear arrangement, progressing in a straight line from one end to the other without significant branching. The central segment is occupied by clusters highlighted in green and purple, within which the most salient cognemes, including Future and Ethics, are distributed.

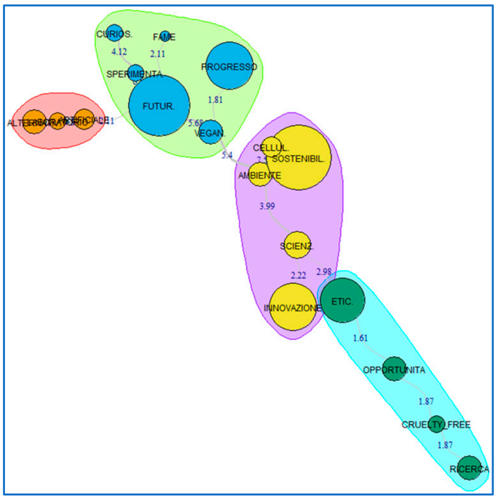

Figure 2. IRaMuTeQ output: Veg Similitude Analysis.

The reference to ethics gives rise to at least two distinct discursive trajectories. The first emphasizes the desirability of a future where animal suffering is no longer a prerequisite for enjoying products such as a traditional porchetta sandwich: "I wrote 'cruelty-free' because I believe that cultured meat eliminates the underlying ethical problem of meat consumption altogether" (ID_271). The second trajectory focuses on the environmental benefits cultured meat could bring: "Cultured meat can be an opportunity both for entrepreneurs to open or convert industries; it is also an opportunity for consumers who want to eat meat but at the same time are environmentally conscious" (ID_286).

Interestingly, in a few isolated instances, cultured meat is perceived as a product primarily targeting individuals who already abstain from meat consumption: "Because it is a solution that targets primarily those who do not consume meat" (ID_275).

Resuming the analysis of prototypicality, the ethical discourse aligns with elements in the lower-left quadrant of the prototypicality matrix, which can be classified as sustaining components of the representation. Ethical themes, such as cruelty-free, serve as benchmarks for evaluating human progress. For instance, respondents identify cultured meat as a milestone in civilization: "I chose 'progress' because I believe that cultured meat is an invaluable step forward, allowing people to not give up meat and a varied diet but eliminating altogether the market that its modus of production requires" (ID_271). Additionally, ethical considerations extend to economic dimensions, positioning cultured meat as a tool for fostering trade with greater awareness of environmental and animal welfare issues: "It is an interesting tool for trade to take place with awareness with respect to issues related to the environment and the treatment of animals" (ID_268).

3.2. Representations' Content

3.2.1. Attitudes and Their Interrelation

In this section, we will present results that are useful for understanding the affective orientations of respondents toward the object ("cultured meat") of the social representation under study. The results of the survey section on eating attitudes and behaviors regarding synthetic meat provide insightful evidence. The data were analyzed using SPSS V. 29.0.1.0 software (see Supplementary Data File S3 "Attitudes") and include descriptive statistics and independent-sample *t*-tests to compare two groups: "Veg" (vegetarians, vegans, and similar individuals) and "Omni" (omnivores). The analysis revealed several key themes, including food neophobia, which examines individuals' willingness to try new foods. For instance, participants were asked, "Are there too many new foods available nowadays"? The survey also investigated attitudes toward genetically modified food, probing participants' views with questions such as, "Is resistance to genetically modified food simply nostalgia for the past"? Additionally, the importance of healthy and natural food was explored, with inquiries like, "Do you feel good when you eat healthy and natural food"? The core focus of the survey was the acceptability of synthetic meat, which included a series of questions assessing participants' willingness to consume synthetic meat in various forms (for example, as an ingredient in a dish or as animal feed) and at different frequencies (such as once, occasionally, or regularly).

Individuals who follow a vegetarian or vegan diet have different perspectives on traditional and new foods compared to omnivores. Omnivores hold a more favorable view of traditional foods, as indicated by an average rating of 4.61 for the statement, "Food made the traditional way is the best in the world". In contrast, vegetarians rate this statement much lower, with a mean of only 2.24. When it comes to new foods, vegetarians are more open-minded. This is reflected in the average rating for the statement, "There are too many new foods available nowadays", which is 2.27 for vegans, compared to 3.79 for omnivores. Additionally, vegans perceive healthcare as less of a source of unnecessary stress, with an average score of 2.59, compared to 2.88 for omnivores. Regarding organic foods, vegans show slightly more confidence in these products, with an average rating of 4.86 compared to 4.83 for omnivores. However, participants in both groups do not believe that organic foods are superior to conventionally produced foods. Overall, vegans appear to be more willing to experiment with new foods and have a more positive attitude toward food innovations, while omnivores tend to prefer traditional, conventional foods.

The average score for the statement "Traditionally made food is the best in the world" is 4.61 for omnivores and 2.24 for vegetarians. The results from the *t*-test indicate significant differences between the vegetarian and omnivore groups regarding their attitudes toward food and new food technologies. Notably, vegetarians demonstrate a greater openness to trying new foods, as evidenced by their significantly lower mean scores for the following statements: "There are too many new foods available nowadays" ($p < 0.05$), "New foods represent unnecessary forms of vanity" ($p < 0.05$), and "I prefer familiar and safe foods" ($p < 0.001$). In contrast, omnivores tend to favor familiar foods and exhibit skepticism toward novel foods. Additionally, vegetarians express greater confidence in new food technologies, reflected in their significantly higher mean scores for the statements "New food technologies are reliable" ($p < 0.05$) and "I believe in the potential of new food technologies" ($p < 0.05$).

Omnivores demonstrate less confidence in synthetic meat technologies compared to vegans. Research indicates that vegans are significantly more open to trying synthetic meat than omnivores. This is reflected in the notably lower mean scores for statements such as "Eating any dish made with synthetic meat would disgust me" ($p < 0.05$) and "Thinking about the taste of synthetic meat makes me nauseous" ($p < 0.001$). Additionally, omnivores tend to agree more with statements like "I would avoid eating a dish that includes synthetic meat, even if a famous chef prepared it", and "It would bother me to see dishes made with synthetic meat on the menu at a restaurant". Conversely, mean scores for statements expressing curiosity about synthetic meat are significantly higher among vegans. For example, statements like "I would be curious to try a dish made with synthetic meat if it was well cooked", "Under special circumstances, I might try a dish made with synthetic meat", and "At a dinner party with friends, I would try novel foods prepared with synthetic meat" all received higher agreement from vegans than omnivores ($p < 0.001$). Furthermore, vegans also showed a greater willingness to purchase synthetic meat ($p < 0.001$).

Vegans tend to prefer healthy and natural foods more than omnivores, as evidenced by significantly higher mean scores for several statements. For instance, they scored higher on statements such as "I feel good when I eat healthy and natural food" ($p < 0.05$), "I would like to eat only foods without additives" ($p < 0.001$), and "I appreciate naturalness in everything" ($p < 0.05$). While omnivores also value these aspects, their scores are lower. Both groups appreciate organic food, but vegans have more trust in this type of food, reflected in their higher mean score for the statement "I trust organically produced foods" ($p < 0.05$). The results of the *t*-test indicate that vegans are more open to new food technologies, are more willing to try synthetic meat, and are more concerned about the naturalness of food compared to omnivores. Significant differences were noted between the two groups across many questions, demonstrating distinct attitudes and eating behaviors. Omnivores displayed a greater tendency toward food neophobia, as shown by their higher mean responses to the statements "There are too many new foods available nowadays" (mean = 3.79 for omnivores vs. 4.86 for vegans) and "New foods represent unnecessary forms of vanity" (mean = 3.21 for omnivores vs. 4.49 for vegans). Vegans demonstrated a greater willingness to consume synthetic meat than omnivores.

For example, when asked, "I feel ready to try synthetic meat foods as soon as they become available in the market", the average response was 5.24 for vegetarians compared to 4.53 for omnivores. Both groups placed significant importance on the taste of food, reflected in high average responses to statements like, "It gratifies me to eat something delicious". Another notable difference emerged in the responses to the statement, "Thinking about the taste of synthetic meat makes me nauseous", with a mean score of 2.98 for omnivores and 1.59 for vegetarians. This suggests that taste could be a significant barrier to the acceptance of synthetic meat, particularly among omnivores. Data analysis regarding the attitudinal dimensions of the social representation of cultured meat offers fascinating insights into eating attitudes and behaviors related to lab-made meat. The results indicate that vegetarians may be more open to trying this type of food, while omnivores tend to be more resistant to change due to their preference for traditional foods and concerns about taste. Overall, the analysis highlights substantial barriers that omnivores face in becoming consumers of synthetic meat.

In summary, it is essential to highlight the skepticism that omnivores have towards novel foods. Research indicates that omnivores prefer familiar foods and exhibit resistance to trying new ones. This preference is supported by significantly higher average scores for the statements, "I prefer familiar and safe foods" ($p < 0.001$) and "Novel foods generate much doubt" ($p < 0.001$). Additionally, omnivores tend to lack confidence in new food technologies compared to vegetarians. This is reflected in their lower average scores for statements like "New food technologies are reliable" and "I believe in the potential of new food technologies" ($p < 0.05$). Furthermore, there is a notable emotional rejection of synthetic meat among omnivores. The data reveals strong aversion, as indicated by significantly higher average scores for statements such as "Eating any dish with synthetic meat would disgust me", "Thinking about the taste synthetic meat might have makes me nauseous", "If I ate a dish and later learned that there were synthetic meat ingredients, I would be disgusted", and "I would avoid eating a dish containing synthetic meat, even if it were prepared by a famous chef" ($p < 0.05$). These responses suggest a pronounced sense of disgust and reluctance towards synthetic meat.

Finally, omnivores tend to have a lower willingness to experiment with new foods. While they may consider trying synthetic meat in exceptional circumstances or when among friends, their overall inclination to explore new food options is less than that of vegetarians. In summary, omnivores exhibit skepticism toward new food technologies, emotional reluctance, and a reduced propensity for experimentation. These factors present significant barriers to the acceptance of synthetic meat within this consumer group.

Correlation analysis reveals interesting connections between attitudes toward food and cultured meat for both omnivores (Table 5) and vegetarians (Table 6). In omnivores, there is a strong negative correlation (−0.634) between "resistance to and suspicion of novelty" and "general intention to consume cultured meat". This suggests that omnivores who are more open to novelty are also more likely to consider eating cultured meat. Conversely, a strong positive correlation (0.741) exists between "adherence to technology" and "general intention to consume cultured meat", indicating that omnivores who value technology are more supportive of cultured meat. For vegetarians, the correlation between "resistance to and suspicion of novelty" and "general intention to consume cultured meat" is weaker (−0.141), suggesting that openness to novelty is less significant in influencing their choice to consume cultured meat. Additionally, "adherence to technology" has a positive correlation (0.404) with "overall intention to consume cultured meat" among vegetarians, although it is not as strong as in omnivores. In both groups, "curiosity about cultured meat" strongly correlates with the intention to consume it. In omnivores, the correlation is 0.77023, while in vegetarians, it is even higher at 0.83956. This highlights that interest and desire to try this new food are key factors in the decision to consume cultured meat.

The correlation between "disgust for cultured meat" and "curiosity for cultured meat" is strongly negative for both omnivores and vegetarians. Specifically, the correlation is −0.751 among omnivores, indicating that as disgust for cultured meat increases, curiosity about it decreases. In vegetarians, the correlation is even stronger at −0.735. This suggests that individuals who feel disgust toward cultured meat are less interested in learning about or trying it. Conversely, those who are curious about this new food are less likely to experience feelings of disgust. Furthermore, the correlation between "adherence to technology" and "disgust for cultured meat" is also negative in both omnivores and vegetarians. Among omnivores, the correlation is −0.702, meaning that higher adherence to technology is associated with lower levels of disgust for cultured meat. In vegetarians, the correlation is −0.461, which, while still negative, is not as strong as in omnivores. In summary, individuals who are more open to technology tend to feel less disgusted by cultured meat, with this trend being more significant among omnivores. Additionally, resistance to new concepts significantly impacts the intention to consume cultured meat, particularly among omnivores.

Table 5. Omni correlational analysis.

		SR_NFQ					CuMAQ			CuM EI-G	CuM EI-S
		1	**2**	**3**	**4**	**5**	**D**	**I**	**F**		
SR_NFQ	1	1.000	−0.603	0.355	0.157	−0.128	0.691	−0.507	−0.363	−0.634	−0.617
	2	−0.603	1.000	−0.358	−0.045	0.255	−0.702	0.640	0.553	0.741	0.702
	3	0.355	−0.358	1.000	0.189	−0.294	0.275	−0.284	−0.236	−0.253	−0.282
	4	0.157	−0.045	0.189	1.000	−0.109	0.043	0.072	−0.006	0.020	0.012
	5	−0.128	0.255	−0.294	−0.109	1.000	−0.154	0.138	0.170	0.189	0.197
CuMAQ	D	0.691	−0.702	0.275	0.043	−0.154	1.000	−0.751	−0.484	−0.851	−0.780
	I	−0.507	0.640	−0.284	0.072	0.138	−0.751	1.000	0.535	0.770	0.659
	F	−0.363	0.553	−0.236	−0.006	0.170	−0.484	0.535	1.000	0.595	0.595
CuM_EI-G		−0.634	0.741	−0.253	0.020	0.189	−0.851	0.770	0.595	1.000	0.868
CuM_EI-S		−0.617	0.702	−0.282	0.012	0.197	−0.780	0.659	0.595	0.868	1.000

Table 6. Veg correlational analysis.

		SR_NFQ					CuMAQ			CuM EI-G	CuM EI-S
		1	**2**	**3**	**4**	**5**	**D**	**I**	**F**		
SR_NFQ	1	1.000	−0.658	0.128	−0.102	0.187	0.366	−0.316	−0.169	−0.141	−0.089
	2	−0.658	1.000	−0.135	0.158	−0.003	−0.461	0.465	0.231	0.404	0.305
	3	0.128	−0.135	1.000	0.040	−0.307	−0.055	0.046	0.291	−0.002	−0.014
	4	−0.102	0.158	0.040	1.000	−0.088	−0.216	0.096	0.087	0.132	0.191
	5	0.187	−0.003	−0.307	−0.088	1.000	0.103	−0.005	0.172	0.146	0.143
CuMAQ	D	0.366	−0.461	−0.055	−0.216	0.103	1.000	−0.735	−0.202	−0.744	−0.718
	I	−0.316	0.465	0.046	0.096	−0.005	−0.735	1.000	0.294	0.839	0.781
	F	−0.169	0.231	0.291	0.087	0.172	−0.202	0.294	1.000	0.348	0.344
CuM_EI-G		−0.141	0.404	−0.002	0.132	0.146	−0.744	0.839	0.348	1.000	0.935
CuM_EI-S		−0.089	0.305	−0.014	0.191	0.143	−0.718	0.781	0.344	0.935	1.000

In the correlation analyses conducted for omnivores, a strong negative correlation of −0.634 was found between “resistance to and suspicion of novelty” and “general intention to consume cultured meat”. This finding suggests that individuals who have a greater resistance to novelty are less likely to consider consuming cultured meat. Conversely, those who are more open to new experiences and technologies show a higher inclination to try this type of food. A similar but weaker correlation of −0.141 is observed among vegetarians. This indicates that while resistance to novelty is relevant for both groups, its impact on the intention to consume cultured meat is more pronounced among omnivores. Additionally, a strong negative correlation exists between “disgust for cultured meat” and “curiosity for cultured meat” in both omnivores and vegetarians. In omnivores, this correlation is −0.751, meaning that as disgust for cultured meat increases, curiosity about it decreases. The correlation is even stronger among vegetarians, at −0.735, indicating that high levels of disgust also lead to low curiosity within this group. These results suggest that individuals who feel disgusted by cultured meat are less interested in learning about or trying it. In contrast, those who exhibit curiosity about this new food tend to experience lower levels of disgust.

Technology adherence is strongly correlated with the intention to consume cultured meat, particularly among omnivores. The correlation coefficient is 0.7411 for this group, indicating that those who are more likely to adopt and use new technologies are also more willing to try cultured meat. This significant correlation suggests that openness to technological innovation extends to the food sector. In contrast, the correlation is weaker for vegetarians, at 0.404. This indicates that adherence to technology has less influence on the intention to consume cultured meat in this group. Overall, the analysis demonstrates that technology acceptance could play a significant role in the willingness to consume cultured meat, especially among omnivores. Additionally, the correlation between “resistance and suspicion toward novelty” and “curiosity about cultured meat” is strongly negative for both omnivores and vegetarians. For omnivores, the correlation is −0.5071, while for vegetarians, it is −0.3162. This means that higher resistance to novelty is associated with lower curiosity about cultured meat. In other words, individuals who are more open to new experiences tend to exhibit greater curiosity about this new type of food.

Correlation analyses reveal statistically significant differences between vegetarians and omnivores regarding their attitudes toward cultured meat. Resistance to Novelty and Consumption Intention: The negative correlation between “resistance and suspicion toward novelty” and “general intention to consume cultured meat” is significantly stronger in omnivores (−0.634) than in vegetarians (−0.141). This suggests that resistance to novelty is a more influential factor in the willingness to consume cultured meat among omnivores. It appears that vegetarians, having already adopted an alternative diet, are more open to considering new types of food, regardless of their general predisposition to novelty. Adherence to Technology and Consumption Intention: The positive correlation between “adherence to technology” and “general intention to consume cultured meat” is also stronger among omnivores (0.741) compared to vegetarians (0.404). This may indicate that omnivores view cultured meat as a technologically advanced product, while this factor might have less influence on vegetarians. Adherence to Technology and Disgust: The negative correlation between “adherence to technology” and “disgust for cultured meat” is more pronounced in omnivores (−0.702) than in vegetarians (−0.461). This finding further supports the notion that omnivores who are more accepting of technology are also more open to new food options, such as cultured meat, and therefore experience less disgust. Overall, the differences observed suggest that vegetarians are less influenced by resistance to novelty and the perception of cultured meat as a technological product compared to omnivores. This may be due to their dietary choices, which have already encouraged them to consider various alternatives to traditional meat. Consequently, vegetarians may evaluate cultured meat based on different criteria, such as environmental impact or animal welfare.

3.2.2. Projective Sensory Experience

In this section, we present results that are useful for understanding respondents’ sensory anchoring to the object (“cultured meat”) of the social representation under study. The Supplementary Materials (File Sensory Analysis S1 and File Sensory Analysis S2) provide the results of the Mann–Whitney U-test, which was conducted to assess several sensory characteristics of cultured meat. This analysis compares the responses of two groups: vegetarians (Veg) and omnivores (Omni). For each sensory characteristic, the report includes the Mann–Whitney U-value, the asymptotic significance (two-tailed test), and the decision regarding whether to reject or retain the null hypothesis. The results indicate significant differences between the two groups for certain sensory characteristics, including “Savory/Savory”, “Tending to Bitterness”, “Aromatic”, “Greasy”, “Succulent”, “Fatty”, and “Persistent”. For these characteristics, the p-values are less than 0.05, leading to the rejection of the null hypothesis. This suggests that the distribution of these sensory characteristics differs between the Veg and Omni groups. Conversely, for other sensory characteristics such as “Tending to Sour”, “Sweet”, “Spicy”, and “Tending to Sweet”, no significant differences were found between the two groups, as evidenced by p-values greater than 0.05. In these cases, the null hypothesis is retained, indicating no evidence of a difference in the distribution of these characteristics between the two groups.

The sensory analysis also examined the participants' imagined sensations, both the most and least bothersome. The results do not show a statistically significant difference regarding the two groups' most or least bothersome imagined. The sensory analysis also explored the participants' imagined sensations, focusing on both the most and least bothersome experiences. The results did not reveal a statistically significant difference between the two groups regarding their most or least bothersome imagined sensations.

For the characteristic "Tasty/Savory", the Mann–Whitney U-test yielded a *p*-value of less than 0.0011. This value is significantly lower than 0.05, leading to the rejection of the null hypothesis. Thus, it is concluded that there is a significant difference in the perception of "Tasty/Savory" between the two groups.

In contrast, concerning the characteristic "Sweet", the test produced a *p*-value of 0.1282. Since this value is greater than 0.05, the null hypothesis was not rejected. Therefore, there is insufficient evidence to suggest a significant difference in the perception of "Sweet" between the two groups.

A comparison of the response distributions between the two groups for each sensory feature, based on the Mann–Whitney U-test, indicates that the null hypothesis (no difference between the groups) was rejected for the following characteristics, highlighting significant differences in perception:

- "Tasty/Savory": The Omni group perceived cultured meat as more "Tasty/Savory" than the Veg group ($p < 0.001$).
- "Prone to Bitterness": The Veg group perceived cultured meat as more "Prone to Bitterness" than the Omni group ($p = 0.031$).
- "Aromatic": The Veg group perceived cultured meat as more "Aromatic" than the Omni group ($p = 0.047$).
- "Greasy": The Veg group perceived cultured meat as more "Greasy" than the Omni group ($p = 0.027$).
- "Succulent": The Omni group perceived cultured meat as more "Succulent" than the Veg group ($p < 0.001$).
- "Fat": The Veg group perceived cultured meat as containing more "Fat" than the Omni group ($p = 0.003$).
- "Persistent": The Veg group perceived cultured meat as more "Persistent" than the Omni group ($p = 0.003$) sensations.

Specifically, for the characteristic "Tasty/Savory", the Mann–Whitney U-test produced a *p*-value < 0.0011. This value is significantly less than 0.05, so the null hypothesis was rejected. It is concluded that there is a significant difference in the perception of "Tasty/Savory" between the two groups.

In contrast, for the characteristic "Sweet", the test produced a *p*-value = 0.1282. The null hypothesis was not rejected since this value was more significant than 0.05. Thus, there is insufficient evidence to say that there is a significant difference in the perception of "Sweet" between the two groups.

Comparison of the distributions of responses between the two groups for each sensory feature considering the Mann–Whitney U-test shows that the null hypothesis (no difference between the groups) was rejected for the following features, indicating a significant difference in perception:

"Tasty/Savory": *Omni* perceived cultured meat as more "Tasty/Savory" than *Veg* ($p < 0.001$).

"Prone to bitterness": *Veg* perceive cultured meat as more "Prone to bitterness" than *Omni* ($p = 0.031$).

"Aromatic": *Veg* perceive cultured meat as more "Aromatic" than *Omni* ($p = 0.047$).

"Greasy": *Veg* perceive cultured meat as more "Greasy" than *Omni* ($p = 0.027$).

"Succulent": *Omni* perceived cultured meat as more "Succulent" than *Veg* ($p < 0.001$).

"Fat": *Veg* perceive cultured meat as more "Fat" than *Omni* ($p = 0.003$).

"Persistent": *Veg* perceive cultured meat as more "Persistent" than *Omni* ($p = 0.003$).

The chi-square test was applied to contingency tables to assess the statistical significance of differences in response frequencies between groups for each sensory characteristic's intensity level (1 to 10). Significant differences mark the following sensory characteristics:

"Savory/Savory": ($\chi^2 = 26.505$, df = 9, $p = 0.002$) and "Succulent": ($\chi^2 = 33.974$, df = 9, $p < 0.001$). The chi-square test found no significant differences for the other sensory characteristics, although the Mann–Whitney U-test showed differences in the overall distributions.

In summary, the perception of sensory characteristics of cultured meat varies between the *Veg* and *Omni* groups. *Omni* people tend to perceive cultured meat as more "Savory/Flavorful" and "Succulent", while *Veg* people perceive it as more "Prone to Bitterness", "Aromatic", "Greasy", and "Persistent".

As a complement to the projective sensory analysis, we also analyzed two additional aspects: "Imagined Sensation More Annoying" and "Imagined Sensation Less Annoying". We processed data, including the participants' "Eating Style" (*Veg* and *Omni)*, using contingency tables and the chi-square test.

Concerning the Most Annoying Imagined Sensation: Contingency tables (page 20 of "Sensory Analysis 1.pdf" and page 2 of "Sensory Analysis 2.pdf") show the frequency with which participants indicated different sensory characteristics as the most annoying. For example, 12 participants (4.1% of the total) indicated "Persistent" as the most bothersome sensation, while 76 (26%) indicated "Tending to sour".

We applied the chi-square test to contingency tables to assess the statistical significance of differences in response frequencies between groups for each intensity level (1 to 10) of various sensory characteristics. Significant differences emerged for two specific characteristics: "Savory/Savory" ($\chi^2 = 26.505$, df = 9, $p = 0.002$) and "Succulent" ($\chi^2 = 33.974$, df = 9, $p < 0.001$). However, the chi-square test did not identify significant differences for the other sensory characteristics, although the Mann–Whitney U-test indicated differences in the overall distributions.

In summary, the perception of sensory characteristics in cultured meat varies between the *Veg* and *Omni* groups. Participants in the *Omni* group tend to perceive cultured meat as more "Savory/Flavorful" and "Succulent", while those in the *Veg* group are more inclined to see it as "Prone to Bitterness", "Aromatic", "Greasy", and "Persistent".

In relation to the variable of the Imagined Least Annoying Sensation, contingency tables (found on page 22 of "Sensory Analysis2.pdf" and page 5 of "Sensory Analysis3.pdf") illustrate the frequency with which participants identified various sensory features as the least bothersome. Specifically, sixty-eight participants (23.3% of the total) chose "Succulent" as the least annoying sensation, while seventy-one participants (24.3%) selected "Tasty/Savory". The chi-square test results (located on page 23 of "Sensory Analysis2.pdf" and page 6 of "Sensory Analysis3.pdf") yielded a p-value of 0.512, indicating that there is no significant difference in the perception of the least bothersome sensation between the *Veg* and *Omni* groups.

In summary, the analysis of Imagined Sensations indicates that there are no significant differences between the two participant groups regarding which sensory characteristics of cultured meat participants perceived as more or less bothersome.

4. Discussion

Moscovici [49] distinguishes between three types of social representations (SRs): 1. "Closed or Hegemonic SRs"—These are characterized by representational elements that are uniformly distributed and shared throughout the entire population; 2. "Agonal, Critical, or Polemical SRs"—These consist of representational elements that are similar across the population, but their meanings are shaped by differing and even conflicting values; 3. "Open or Emancipated SRs"—These feature representational elements that circulate among various subgroups within a population. It is necessary to bring these elements together to uncover their coherence.

The social representation of cultured meat, which is the focus of the study discussed in the previous pages, aligns with the latter category, open/emancipated SRs. To facilitate the analysis, the study specifically examines the differences between omnivores (Omni) and vegetarians/vegans (Veg), highlighting only the most significant results due to space considerations.

The social representation of cultured meat varies significantly between omnivores and vegetarians. For omnivores, three central elements characterize their representation of cultured meat: 1. "Sustainability": Omnivores view cultured meat as a sustainable option that can help reduce the environmental impact of intensive farming; 2. "Innovation": They recognize cultured meat as an innovative and unprecedented product that sparks curiosity about its taste, texture, and long-term effects. Previous studies have shown that the innovative nature of cultured meat production significantly influences customer rejection and the overall lack of acceptability of these products [50–53].

3. "Future": Cultured meat is considered a viable solution for the future, addressing the challenges of increasing meat demand and environmental sustainability. In contrast, vegetarians focus on three different central elements in their representation of cultured meat: 1. "Sustainability": Like omnivores, vegetarians also prioritize sustainability. They see cultured meat as a more sustainable alternative to traditional livestock farming that can mitigate environmental harm. 2. "Ethics": Ethics plays a crucial role for vegetarians. They perceive cultured meat as a cruelty-free solution that eliminates animal suffering and promotes animal welfare. Also, Liu et al. [54] found that participants who had ethical issues with traditional meat evaluated cultured meat as a better option.

3. "Science": Cultured meat is viewed as a product of scientific advancement and technological innovation that can contribute to a more sustainable and ethical future. An analysis of prototypicality and cognitive salience confirms that these elements are central to both omnivores and vegetarians/vegans. This favorable consideration of technology represents the basis of these interviewees' acceptance of cultured meat. Food technology neophobia, in fact, refers to the unwillingness to consume food created by innovative or unfamiliar technology. Dupont, Harms, and Fiebelkorn [55] found that food technology neophobia was the most significant negative predictor of cultured meat acceptance. Research has also shown that emotions linked to new food and technology influence consumers' judgments about risks and benefits [56,57].

These results are consistent with some studies that showed that extrinsic attributes of food, such as environmental impact, animal welfare, and food security, influence consumer choices. Many people are motivated to eat cultivated meat for its societal benefits and sustainability rather than personal gain [55]. Studies show consumers prioritize social over individual advantages [20].

Green consumption values contribute to positive attitudes toward cultivated meat, reflecting how ecological ideals shape buying behaviors [58]. Consumers increasingly consider cultivated meat a sustainable alternative [59]. Awareness of environmental issues correlates with support for cultivated meat technology [60].

While some see cultivated meat as a natural resource [61,62], older European consumers may not consistently consider sustainability when choosing protein sources [63].

The differences in attitudes toward cultured meat are also evident in the similarity analysis. For omnivores, the term "artificial" stands out as a prominent peripheral element associated with the laboratory, connecting it to various meanings attributed to the product.

Innovation plays a central role for omnivores, sparking curiosity about the taste, texture, and long-term impacts of cultured meat. In contrast, for vegetarians, the similarity analysis reveals a more linear framework, where the future and ethics are at the core of their reasoning. Their ethical discussions center on eliminating animal suffering and promoting environmental benefits. The study results highlight the ethical and economic dimensions surrounding the perception of cultivated meat. Analyzing the nuances between omnivores and vegetarians/vegans, ethics emerges as a central theme in how cultivated meat is represented socially among vegetarians and vegans. The concept of "cruelty-free" serves as a benchmark for assessing human progress, with cultivated meat viewed as a significant advancement that aims to eliminate animal suffering. Participants from the vegetarian and vegan groups often perceive cultivated meat as a solution primarily for those who already refrain from meat consumption. Among omnivores, cultivated meat is also regarded as a response to ethical concerns, particularly regarding reducing intensive farming practices. Ethical considerations intertwine with economic aspects, positioning cultivated meat as a means to encourage trade that is more conscious of environmental issues and animal welfare. The data available does not facilitate a detailed analysis of the economic dimensions from the perspective of omnivores; rather, it leans more toward innovation and sustainability. In fact, vegetarians and vegans are more open to considering cultivated meat, evaluating it based on criteria such as environmental impact and animal welfare. This contrasts with omnivores, who are more influenced by resistance to novelty and the perception of cultivated meat as a technological product. They tend to exhibit a higher tendency toward food neophobia, preferring traditional foods and showing skepticism towards new food options. Additionally, they have less trust in new food technologies compared to vegetarians.

The analysis of eating attitudes and behaviors further highlights these differences. Vegetarians display a greater openness to trying new foods and show more confidence in new food technologies compared to omnivores. On the other hand, omnivores tend to prefer traditional foods and exhibit skepticism toward novelty, with a pronounced food neophobia. When it comes to cultured meat, vegetarians are significantly more willing to try it than omnivores. Omnivores, however, experience a strong emotional aversion to cultured meat, marked by feelings of disgust and reluctance. Taste seems to be a major barrier to acceptance, especially among omnivores. Resistance to novelty plays a significant role in shaping the intention to consume cultured meat, particularly for omnivores.

Correlational analyses indicate a strong negative correlation (-0.634) between resistance to novelty and the overall intention to consume cultured meat within this group. This suggests that omnivores who resist novelty are less likely to consider trying cultured meat.

Conversely, omnivores who are more open to new experiences and technologies are more inclined to try this type of food. While a similar correlation exists among vegetarians, it is weaker (-0.141). This might be attributed to the fact that vegetarians, having already adopted an alternative diet, are more open to considering new types of food, irrespective of their overall predisposition to novelty.

Resistance to novelty is inversely related to curiosity about cultured meat among omnivores (-0.5071) and vegetarians (-0.3162). This means that as resistance to new experiences increases, curiosity about this new food decreases, and vice versa.

In contrast to the results of all the studies on this topic recently reviewed by Hanan et al. [21], disgust does not play a role in the differentiation between the social representations explored in this research. In fact, other variables contributed significantly to the affective–cognitive positioning of our respondents towards cultured meat. In summary, resistance to novelty is a significant barrier to the acceptance of cultured meat, particularly for omnivores. These consumers often have a strong attachment to traditional food products, which means they may require clear communication and information about the benefits of cultured meat to help them overcome their resistance and consider this new food option. There is a notable negative correlation between "resistance and suspicion towards novelty" and "general intention to consume cultivated meat", which is significantly stronger among omnivores (−0.634) than among vegetarians (−0.141). On the other hand, the positive correlation between "technology adoption" and "general intention to consume cultivated meat" is stronger among omnivores (0.741) than among vegetarians (0.404). Furthermore, the negative correlation between "technology adoption" and "disgust towards cultivated meat" is more pronounced among omnivores (−0.702) than among vegetarians (−0.461). In summary, while both groups recognize the ethical implications of cultivated meat, vegetarians and vegans tend to emphasize ethical and environmental factors more heavily, whereas omnivores are significantly influenced by their openness to novelty and technology. Economic dimensions are considered by vegetarians and vegans in the context of ethical and sustainable trade.

Additionally, sensory perceptions of cultured meat vary between vegans and omnivores, as indicated by the Mann–Whitney U test and chi-square tests discussed in previous sections. Omnivores perceive cultured meat as being more "tasty/savory" and "juicy" compared to vegans. This difference is statistically significant, as demonstrated by various tests. On the contrary, vegans tend to describe cultured meat as more "bitter", "aromatic", "fatty", and "lingering" than omnivores, with these differences also showing statistical significance. Interestingly, there were no significant differences between the two groups regarding sensations that they perceive as bothersome or not.

Several factors may influence these variations in sensory perceptions, including:

- Familiarity with the taste of meat: Omnivores, being regular meat consumers, may have a clearer expectation of flavor and texture.
- Expectations and biases: Vegans may have different anticipations or biases toward cultured meat, driven by their choices to avoid meat for ethical or health reasons.
- Physiological differences: There may be physiological differences between vegans and omnivores that affect their taste perception.

The differences in sensory perceptions between vegans and omnivores indicate that the marketing and presentation of cultured meat need to be tailored to different target audiences, considering their expectations and preferences.

Additionally, food neophobia—the reluctance to try new foods—negatively impacts the intention to consume cultured meat, especially among omnivores. Correlational analyses revealed a significant negative correlation between resistance to novelty and the intention to consume cultured meat.

Omnivores who display higher levels of food neophobia are less likely to consider eating cultured meat. This trend is supported by significantly higher average scores on statements like, "There are too many new foods available nowadays" and "New foods represent unnecessary forms of vanity". In contrast, vegetarians show a weaker correlation between food neophobia and their intention to consume new foods. This suggests that factors such as ethical or environmental motivations may play a larger role in influencing their openness to trying new foods.

Food neophobia is intricately linked to how cultured meat is perceived as a "new" and "technological" product. Omnivores, who often resist novelty, typically have less confidence in new food technologies and tend to view cultured meat with skepticism. This phobia serves as a significant barrier to the acceptance of cultured meat, particularly among omnivorous consumers. To overcome this resistance, effective communication strategies are essential. These strategies should emphasize the "familiarity" of cultured meat, highlighting its similarity to traditional meat in terms of taste and texture. Clear and transparent information about the production process is crucial to alleviating concerns about the “artificiality” of the product. Furthermore, promoting tastings of cultured meat —in countries that allow this practice, unlike in Italy [64]—can let consumers directly experience its positive sensory characteristics.

One significant barrier to the adoption of cultured meat is technological neophobia, which refers to the resistance to embracing new technologies. The research results demonstrate a strong correlation between this neophobia and the consumption of cultured meat, particularly among omnivores. Correlational analyses revealed a robust positive correlation of 0.741 between “technology adherence” and “overall intention to consume cultured meat” in omnivores. This suggests that individuals who are more inclined to adopt and use new technologies are also more willing to try cultured meat. In contrast, the correlation is weaker among vegetarians, at 0.404. This indicates that technological adherence has less impact on their intention to consume cultured meat because factors such as ethics and sustainability play a more significant role in their decision-making.

Technology neophobia is negatively correlated with feelings of disgust towards cultured meat. Among omnivores, this correlation is −0.702, indicating that greater acceptance of the technology reflects less aversion to cultured meat. In contrast, vegetarians show a weaker correlation of −0.461, suggesting that other factors may also influence their feelings of disgust. Thus, technological neophobia poses a significant barrier to the acceptance of cultured meat, particularly among omnivores. To enhance the popularity of this innovative food, it is essential to implement communication strategies that:

1. Highlight the technological benefits of cultured meat, such as improved food safety and better control over product quality;
2. Address concerns related to artificiality by presenting cultured meat as a natural product derived from a scientifically controlled process;
3. Emphasize the innovative aspects of cultured meat, positioning it as a forward-thinking solution for the future of food.

In conclusion, several factors influence the social perception of cultured meat. Dietary preferences play a key role. However, the results indicate that openness to innovative ideas and confidence in technology are also significant factors that intersect with dietary choices. Vegetarians, motivated by ethical and environmental concerns, are more open to considering cultured meat as a viable alternative. In contrast, omnivores tend to be more resistant due to sensory preferences and a predilection for traditional foods.

5. Conclusions

Our research asked whether omnivores and vegetarians/vegans differ in their representation of cultured meat. The findings confirm significant differences in attitudes and sensory perceptions. Key differentiators include:

- Resistance to Novelty: Omnivores tend to be more hesitant to try new products, resulting in lower consumption intentions and higher disgust, while vegetarians are more open.
- Adherence to Technology: Omnivores embracing technology show greater acceptance, whereas those resistant tend to exhibit more disgust. In contrast, vegetarians prioritize ethical concerns.
- Taste Perception: Omnivores often associate cultured meat with familiar, enjoyable flavors, whereas vegetarians—especially those who rarely consume meat—may find it less appealing.

The study’s strengths lie in its multi-method approach (combining quantitative and qualitative data), direct comparison between consumer groups, and innovative projective sensory analysis. However, limitations include a small vegetarian sample (n = 49) and reliance on imagined sensory experiences due to tasting restrictions in Italy. Future research should expand the sample size, incorporate real tastings, and explore additional factors like pricing and product availability.

Cultured meat represents a groundbreaking, sustainable innovation. Its successful adoption depends on nuanced communication that addresses both technological and ethical dimensions, empowering consumers and informing policy.

These insights suggest tailored marketing strategies: emphasizing taste, safety, and naturalness for omnivores, and highlighting ethical, environmental, and health benefits for vegetarians/vegans.

Based on the results shown above, it could be possible to personalize marketing strategies based on consumer groups. Omnivores are more resistant to adopting new food products due to their sensory preferences and attachment to traditional foods. Marketing strategies targeting this group should emphasize how cultivated meat resembles traditional meat in taste and appearance. It is crucial to reassure them about the product's safety and "naturalness" to alleviate any technological concerns. Vegetarians and vegans, motivated by ethical and environmental issues, are typically more open to considering cultivated meat as a viable alternative. For this audience, marketing should highlight the ethical and environmental advantages of cultivated meat, such as the absence of animal cruelty and a reduced environmental impact. Sensory anchors significantly influence omnivores' perceptions of food. They often view cultivated meat as more "tasty", "flavorful", and "succulent". To leverage these anchors in marketing, communicational strategies should:

Emphasize Taste and Texture: Communicate that cultivated meat offers a sensory experience similar to traditional meat. Use descriptions that evoke familiar flavors and textures appreciated by omnivores.

Offer Tasting Opportunities (we are planning an international research project involving countries that allow cultivated meat commercialization): When possible (and legal), organize tastings so consumers can directly experience the positive sensory characteristics of cultivated meat.

Use Images and Videos: Present images and videos that display cultivated meat prepared in appetizing and familiar ways, highlighting its appealing appearance and texture.

Marketing professionals could imagine specific messages from these assumptions. Specifically, to resonate with the ethical and environmental concerns of vegetarian and vegan consumers (the most likely to eat clean meat among those we have surveyed), marketing messages could include:

Animal Welfare: "Enjoy the taste of meat without cruelty. Cultivated meat is produced without causing animal suffering".

Environmental Impact: "Reduce your ecological footprint with cultivated meat. It uses less land, less water, and produces fewer greenhouse gas emissions".

Sustainability: "Choose a sustainable future with cultivated meat, an innovative alternative to feed the world responsibly".

Health: "Make a healthy choice with cultivated meat. It is rich in protein, free from antibiotics, and lower in saturated fats".

Ethics: "Join a movement towards a more ethical diet. Cultivated meat respects both animals and the environment".

These messages, if supported by transparent information about the production process and the specific benefits of cultured meat compared to conventional meat, could also influence the consumption behavior of omnivores.

Supplementary Materials: The following supporting information can be downloaded at: https://www.mdpi.com/article/10.3390/app15052795/s1.

Author Contributions: Conceptualization, R.F.; methodology, R.F. and A.P.; formal analysis, S.F.; investigation, G.A., A.L., S.C. and E.C.; data curation, E.C. and S.F.; writing—original draft preparation, R.F. and A.P.; writing—review and editing, R.F., S.F. and A.P.; supervision, R.F. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The data presented in this study are available on request from the corresponding author due to privacy reasons.

Conflicts of Interest: The authors declare no conflicts of interest.

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