SCHOOL OF ECONOMICS AND MANAGEMENT

The Cultivation of an Industry: Navigating Business Challenges and Consumer Trends in Europe's Emerging Meat Market

By

Manon Carassus & Natalie Da Ros

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Supervisor: Prof. Dr. Thomas Kalling

Abstract

This thesis examines the nascent sector of cultivated meat in Europe, analysing its potential market penetration against the backdrop of evolving consumer attitudes, complex regulatory frameworks, and innovative business models. Given the pressing environmental concerns associated with traditional meat production, cultivated meat presents a sustainable alternative that promises to reshape the meat industry. This study employs a mixed-methods approach, integrating quantitative survey data from consumers across multiple European countries with a qualitative case study of an emerging start-up in the sector. The findings indicate that several factors are critical in influencing consumer acceptance, including environmental awareness, health concerns, and sensory attributes. Furthermore, the study identifies key demographic segments, such as younger consumers and women, as primary targets for marketing strategies. The implications of these findings suggest that businesses should adopt a phased localisation strategy to enhance consumer acceptance and address market-specific preferences. The findings of this research offer actionable insights for companies seeking to innovate their business models and navigate the cultivated meat market, thereby contributing to the sustainable growth of this innovative industry.

Keywords: Business Model, Business Model Innovation, Consumer Acceptance, Consumer Preferences, Cultivated Meat, Dietary Attitudes, Driving Factors, Environmental Concerns, Health Concerns, Price, Strategies, Targeted Segments.

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List of Abbreviations

BM: Business Model

BMI: Business Model Innovation

CM: Cultivated Meat or Cultured Meat

CX: Customer Experience

1 Introduction

1.1 Background

The global food production system is currently facing a number of unprecedented challenges, including environmental degradation, population growth, and resource depletion. As part of this system, the meat industry is a significant contributor to these challenges. Indeed, it has been identified by the United Nations as responsible for approximately 14.5% of global greenhouse gas emissions, which represents a major factor in climate change (Lazarus, McDermid & Jacquet, 2021). This, in turn, exacerbates several environmental pressures, including land degradation, deforestation, and water scarcity. Moreover, livestock farming is a significant contributor to global protein production, as it occupies approximately 75% of agricultural land and accounts for only a third of the world's protein supply (Good Food Institute, 2023a). Furthermore, the inefficiency inherent in traditional meat production has been increasingly scrutinised. Studies have revealed that the caloric output from livestock is substantially lower than the caloric input required to sustain them, thereby highlighting a significant imbalance in energy conversion within this sector (Smith et al., 2021). Concurrently, there has been a growing movement to raise awareness about animal welfare issues, reflecting a broader societal shift towards more ethical considerations in food production practices (Fraser et al., 1997). Furthermore, the overuse of antibiotics in animal agriculture has been implicated as a potential catalyst for a public health crisis termed the '*post-antibiotic era'*. Projections indicate that by 2050, antibiotic resistance, exacerbated by the indiscriminate use of antibiotics in livestock, could render previously manageable infections lethal, posing a severe threat to global health (United Nations Environment Programme and International Livestock Research Institute, 2020). The implications of such a development would be profound, reversing decades of medical progress in treating infectious diseases. Despite these challenges, it is critical to recognise the nutritional value that meat provides. Meat is a rich source of essential nutrients, including high-quality protein, vitamins, and minerals, which are crucial for various bodily functions (Boateng, Nasiru & Agyemang, 2020). This dichotomy underscores the need for a balanced approach to addressing the environmental and health challenges posed by the meat industry while considering its nutritional contributions.

As global populations continue to grow, with projections indicating an increase to 9.8 billion by 2050, the demand for meat, particularly poultry, is expected to surge by as much as 120% (United Nations, 2024). This burgeoning demand presents significant challenges for sustainability, as current meat production practices are not only resource-intensive but also environmentally degrading. In addressing these issues, Nidumolu et al. (2009) propose the need for businesses to innovate in order to create sustainable solutions that meet the needs of the present, whilst also considering the needs of future generations in a way that does not compromise their ability to do so themselves (Nidumolu, Prahalad & Rangaswami, 2009). This perspective highlights the urgent need for a transformative approach to be adopted within the meat production industry.

In response to the sustainability challenges currently facing the meat industry, three innovative alternatives to conventional meat production have gained prominence: plant-based meats, fermentation-derived products, and cultivated meats. Plant-based alternatives, which utilise ingredients derived from plants to simulate the experience of meat, represent a sustainable and cruelty-free option, significantly reducing the environmental footprints associated with traditional livestock farming (Schmidinger, Bogueva & Marinova, 2021). Similarly, fermentation-derived products employ microbial processes to create proteins that mimic meat's taste and texture, offering a scalable solution that could lessen the strain on natural resources (Boukid et al., 2023). However, this paper will focus on cultivated meat, which represents a significant departure from traditional meat production paradigms. Also known as lab-grown, cell-based, artificial, or cultured meat, this technology involves the cultivation of animal muscle tissue from cell cultures in controlled environments, namely bioreactors, where cells are further grown. Cells are then transferred to a scaffold, where they form into muscle fibres and larger tissue (See Figure 1).

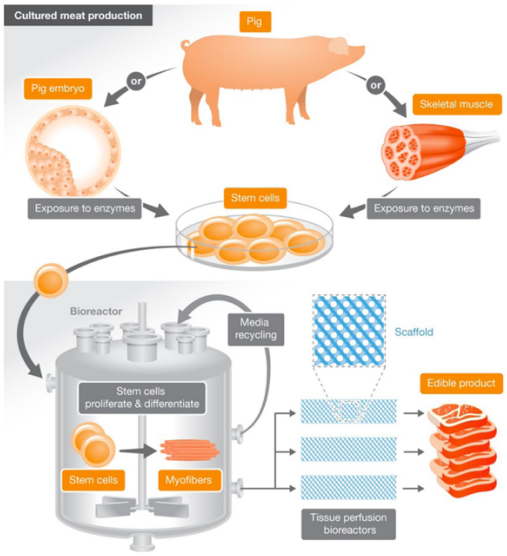

Figure 1 *- The production process of cultured meat. [Source: Treich (2021), p. 40].*

This innovative process aims to replicate the sensory and nutritional qualities of conventional meat without the extensive land, water, and greenhouse gas costs typically associated with livestock farming. The Good Food Institute highlights that cultivated meat could dramatically reduce resource use, with potential reductions of up to 99% for land and 96% for greenhouse gas emissions compared to traditional methods (Good Food Institute, 2023b). Furthermore, the elimination of the necessity for animal slaughter renders cultivated meat a cruelty-free alternative, while also reducing the risk of foodborne illnesses, such as those caused by E. coli or Salmonella, due to the controlled production environments (Good Food Institute, 2023b). In addition, GFI emphasises the nutritional advantages of cultivated meat, which can be tailored to meet individual consumer preferences and health requirements. The organization also highlights the potential of cultivated meat to address global food security challenges by providing a sustainable source of protein.

Although cultivated meat presents promising benefits, its advancement is hindered by significant challenges, including scalability, funding, costs, regulatory frameworks, and consumer acceptance. The primary factor contributing to the high production costs associated with cultivated meat is the necessity for specialized equipment and complex growth media, which significantly impede scalability and market competitiveness (Verbeke et al., 2020). This issue of scalability is of paramount importance, as the transition from small-scale laboratory experiments to large-scale production necessitates substantial investment and technological optimization (Bryant & Dillard, 2019).

Furthermore, the environmental promise of cultivated meat, one of its most compelling selling points, has not been without controversy. A pivotal moment occurred when Spang and his team published Life Cycle Assessment (LCA) scenarios suggesting that under certain conditions, cultivated meat could potentially have an environmental impact comparable to or even worse than traditional meat production. This study sparked intense debate and misinformation, placing the environmental credentials of cultivated meat under scrutiny. In response, many researchers in the field of LCA have refuted and advocated Spang to retract and review his conclusion. Nevertheless, subsequent research by organisations such as CE Delft has indicated more favourable outcomes, suggesting that with the development of improved technology, cultivated meat could significantly lower its carbon footprint by 2030 (Good Food Institute, 2024). Similarly, Tuomisto and her team have proposed scenarios where the climate benefits of cultivated meat are more pronounced, challenging earlier pessimistic assessments. (Crownhart, 2023; Tuomisto, Allan & Ellis, 2022).

Regulatory differences across regions further complicate the commercialization of cultivated products, which can create additional obstacles to potential market entry and product approval (Laestadius & Caldwell, 2015). Those disparities put pressure on companies as they must conduct rigorous safety assessments and establish comprehensive regulatory frameworks to ensure that consumer health and safety standards are met. Therefore, this can lead to delays in time-to-market and increased operational costs (Post, 2012). Regulatory complexities vary not only between countries but also within regions, creating a fragmented landscape that cultivators must navigate (Hopkins, 2015). The lack of harmonised regulations further complicates the path to market for cultivated meat, requiring substantial resources and time for compliance (Bryant & Dillard, 2019).

Moreover, the success of cultivated meat is contingent upon consumer behaviour and acceptance, which are influenced by perceptions of naturalness, ethical considerations, taste preferences, and price sensitivity (Wilks & Phillips, 2017). Consumer scepticism, often referred to as the 'yuck factor', along with concerns about the sensory attributes and production methods of lab-grown meat, represents a significant obstacle to market penetration (Bryant & Dillard, 2019). It is therefore of the utmost importance to address these consumer attitudes if cultivated meat products are to be accepted on a long-term basis (Verbeke et al., 2020).

In conclusion, while the path forward for cultivated meat is fraught with challenges, it is essential to understand and address these multifaceted barriers to foster the sector's growth. In order to achieve this, businesses must innovate not only in production and regulatory compliance but also in market strategy and consumer engagement (Karmaus & Jones, 2020).

The success of this emerging industry will require a concerted effort from scientists, regulators, marketers, and educators to align technological advancements with consumer expectations and regulatory standards. The development of new business models that reflect these complexities will be critical in realizing the potential of cultivated meat to transform the global food landscape (Nidumolu, Prahalad, & Rangaswami, 2009).

1.2 Problematization

The global discourse on cultivated meat is characterised by a spectrum of reactions, ranging from enthusiastic acceptance to significant reluctance. This reveals the complexity of consumer and regulatory attitudes towards this emerging food technology. A pertinent example is the United States, where diversity is pronounced. Indeed, states, such as California, are leading in embracing and nurturing cultivated meat start-ups due to their progressive sustainability agendas. Companies such as Memphis Meats and Just, Inc. have thrived in this environment, receiving substantial investments, and benefiting from a supportive public and policy environment (GFI, 2024). In stark contrast, the state of Florida has introduced legislation that criminalises the sale or production of cultivated meat, thereby exemplifying a severe regulatory backlash against this nascent industry (Reynolds, 2024). This disparity not only underscores the varying levels of acceptance but also the potential challenges and opportunities these differences create for the industry. The contrasting approaches in California and Florida exemplify how state policies, societal perceptions, and market dynamics can significantly influence the development and acceptance of cultivated meat.

Although this paper makes references to the global context in order to illustrate the broader challenges and opportunities within the cultivated meat industry, our primary focus is on Europe, where the response to cultivated meat is equally varied and is influenced by distinct cultural and regulatory landscapes in a way that is unique to this continent. The Netherlands for example stands out for its proactive support for cultivated meat, viewing it as a cornerstone for future sustainable food systems (Verhulst, 2023). In contrast, countries such as France and Italy show a more cautious approach, with cultural and traditional ties to conventional meat playing a significant role in their hesitant acceptance (Mancini & Antonioli, 2019). These differences across European nations illustrate the complex interplay between cultural values, economic interests, and regulatory frameworks that shape the cultivated meat landscape. Despite the recognised potential for cultivated meat in the European market, there remains a substantial gap in comprehensive data concerning consumer preferences and price sensitivity

within this region (Verbeke et al., 2020). This gap presents a critical barrier to the effective entry and strategy development for cultivated meat products. Therefore, it is of utmost importance for businesses looking to enter and succeed in the European market to gain an understanding of the demographics of potential consumers, as well as their willingness to pay and accept cultivated meat. Given this context, it becomes clear that a detailed examination of consumer segments, pricing dynamics, and market opportunities within Europe is necessary.

1.3 Research Question and Purpose

As we examine the potential of cultivated meat within the European context, this chapter outlines the research questions that guide this thesis. These questions are informed by existing studies on consumer behaviours towards alternative proteins. The aforementioned studies demonstrate significant variations in acceptance and market readiness, thereby underscoring the necessity for a nuanced analysis that this research aims to provide. Additionally, very few studies combined property descriptions of cultured meat with the properties of business models. Therefore, the initial objective of this study is to evaluate the European cultivated meat market by conducting a quantitative analysis and identifying potential consumer segments based on their attitudes towards cultivated meat. Insights derived from these groups will help us assist companies in developing targeted marketing strategies. Furthermore, an examination of potential market penetration across European countries will reveal whether there are regional differences in acceptance rates, that would suggest areas with market growth for cultivated meat products.

The primary objective of this thesis is to examine the prerequisites for companies to develop effective business models in the context of the inherent uncertainties associated with the cultivated meat sector.

By providing practical guidance for companies and start-ups in the European meat industry, this thesis aims to contribute significantly to the understanding of business models, consumer behaviour, and market dynamics. Through detailed analysis and a case study, this research endeavours to support the successful establishment and growth of cultivated meat ventures in Europe. This study will address the following central research questions:

- *What are the key factors driving consumer acceptance of cultivated meat in Europe, and which consumer segments should companies specifically target based on these factors?*

- *How can companies adapt their business models to capitalize on the unique challenges and opportunities in the cultivated meat market in Europe, and how can these adaptations inform broader theories of consumer preferences and strategic business decision-making in emerging markets?*

This research proposal recognizes its limitations, including the constraints posed by the specific sample size and demographic focus, which may affect the generalizability of the results. Future research could benefit from larger and more diverse samples to enhance the comprehensiveness of the findings. The reliance on current models and the restricted timeframe of the study may also limit the depth of long-term trend analysis and regulatory change assessments. Ongoing monitoring and geographical expansion will be crucial for global strategic decision-making.

1.4 Outline of the Thesis

In order to answer the initial research question, it is necessary to gain an understanding of the key factors that influence consumer acceptance of cultivated meat in Europe. This entails investigating themes such as health benefits, affordability, environmental sustainability, ethical considerations, and sensory attributes. A review of relevant studies and academic literature is conducted to provide a comprehensive background on these factors. In addressing the second research question, the focus shifts to how companies can adapt their business models to capitalise on the distinctive challenges and opportunities presented by the cultivated meat market. This discussion includes an examination of strategic business decisions and market dynamics, informed by the theoretical frameworks and models pertinent to business model innovation and market strategy.

The following chapter presents our literature review examining the disruption and implications of the emerging cultivated meat industry, focusing on consumer acceptance and the economic business models suitable for this sector.

The next section outlines the methodology employed in this study, including a detailed description of the research design, data collection methods, and analysis techniques. This chapter also addresses potential limitations and provides an overview of the target group for the study.

Subsequently, the empirical findings are presented for the methodology, emphasising the overall results and the key insights derived from the data. This chapter presents a comprehensive analysis of consumer demographics and preferences and the factors influencing their acceptance of cultivated meat.

The findings are then integrated with the theoretical insights from the literature review in the final results and discussion chapter, to identify connections and implications for business strategies in the cultivated meat industry.

The final part of the thesis examines strategies to overcome consumer resistance, offering actionable insights for businesses. This latter section aligns with the preliminary framework established earlier and it concludes with a refined version, including a specific localisation strategy useful to foster innovative business practices.

2 Literature Review

2.1 Disruption and Implications of the Emergence of Cultured Meat Industry

The objective of this literature review is to gain an understanding of two crucial elements: firstly, the factors conditioning consumers' acceptance, and secondly, the economic business model suitable for a company facing this new disruptive sector. By synthesising the interrelated economic, technical, legal, and social aspects of lab-grown meat we can gain a clearer understanding of the drivers affecting consumer perceptions and their variability among European countries.

In this paragraph, we argue about the potential disruption of cultured meat and its implications in the conventional meat industry, in order to provide an overview of the context within which the thesis is situated. It is crucial to bear in mind that the growth and success of this sector depends on complex social structures and government policies, which will continue to expand in the years ahead and will differ across countries, adding further variability to the context of analysis. Research into public perceptions of cultivated meat reveals a considerable degree of variability in attitudes, with a significant proportion of the population expressing either strong support or significant opposition. The variability in consumer response to new food products is considerable. In this context, individuals tend to rely heavily on their initial impressions and the opinions of others when encountering a new food product about which they have limited knowledge (Siegrist & Hartmann, 2020).

Moreover, there are critical questions pertaining to the production and adoption of cultured meat; these include identifying the stakeholders who will be involved in the production of cultured meat, such as large meat companies, farmers, agri-businesses, and bio-scientists. Additionally, it is crucial to determine which of these stakeholders are prepared to adopt and scale these products once they reach the market (Stephens et al., 2018). While some experts predict that cultured meat could provide a new frontier for multinational corporations, (Driessen & Korthals, 2012; Hocquette, 2016), others envision the potential for localised and connected relationships with the meat production industry, as discussed by van der Weele and Driessen (2013). Therefore, understanding how cultured meat companies will be situated within the existing scenario is crucial. In this regard, Rasmussen et al. (2024), forecast that cultured meat will be commercially available to Nordic consumers in the future if issues such

as cell culture techniques, consumer acceptance of GMOs and sustainable sourcing of materials are resolved.

Another aspect to be considered by established meat companies and start-ups entering the cultivated meat sector is the challenge of incorporating sustainable practices to mitigate the environmental impact, thereby directly impacting the value proposition of cultivated meat companies. Lynch and Pierrehumbert (2019) emphasise the necessity - for large-scale cultured meat production facilities - to integrate renewable energy sources into their operations. They caution that without such practices, the carbon dioxide emissions generated by these facilities could rival or exceed those of conventional livestock production, potentially undermining the claim that cultured meat is inherently more sustainable (Lynch & Pierrehumbert, 2019). Furthermore, Newburger (2019), further highlighted the challenge of accurately assessing the carbon footprint of large-scale cultivated meat production, exacerbated by the industry's nascent stage and the consequent lack of comprehensive data resulting from the absence of commercialisation. Consequently, addressing these environmental considerations becomes crucial for businesses seeking to effectively align with the evolving consumers' expectations about sustainability. By effectively managing and communicating their environmental strategies, companies can strengthen their value proposition and deepen consumer relationships. This commitment to sustainability can serve as a competitive advantage, attracting consumers who are increasingly making purchasing decisions based on environmental considerations (Lynch & Pierrehumbert, 2019; Newburger, 2019).

In providing this context for our thesis, it is important to note that our primary focus lies not in resolving the intricate questions surrounding the production and adoption of cultured meat. Rather, we aim to examine the broader implications of the factors affecting its reception by individuals and its influence on business models and consumer perceptions.

This contextual background serves to illustrate the complexity of the landscape in which cultured meat companies operate to highlight the critical considerations that shape their strategies and value propositions.

2.2 A Crucial Factor: Customers' Acceptance of Cultured Meat

As stated by Hocquette (2016), the most critical obstacle to overcome is consumer acceptance. In his research paper, he illustrates the various aspects influencing consumer receptivity toward lab-grown meat, highlighting different aspects such as human health, animal welfare, environmental impact, food security, culinary traditions, level of urbanization, and

other socio-economic factors. Hocquette visual representation underscores the complex interplay among the aforementioned variables that shape the attitude toward this emerging food (See Figure 2). Cultured meat proponents have adopted a strategic communication approach that responds to the evolving societal values. They emphasise its potential benefits in terms of reducing the environmental impact of meat production, as well as its alignment with consumer preferences for ethical and high-quality production methods. These benefits are believed to be key to building support among consumers (Hocquette, 2016). However, the concept of 'artificial meat' is currently deeply entrenched in the public consciousness, given the strong consumer preference for natural and minimally processed foods. This preference is incompatible with the notion of lab-grown meat, which challenges the traditional perception of 'naturalness' associated with traditional meat sources. Hocquette (2016) further analyses the barriers to the social acceptance of artificial meat as it is constrained by overarching values and beliefs about food provenance and authenticity. The debate surrounding this type of meat is in essence about the interplay between technological innovation, consumer preferences and their social value, as depicted in Figure 2.

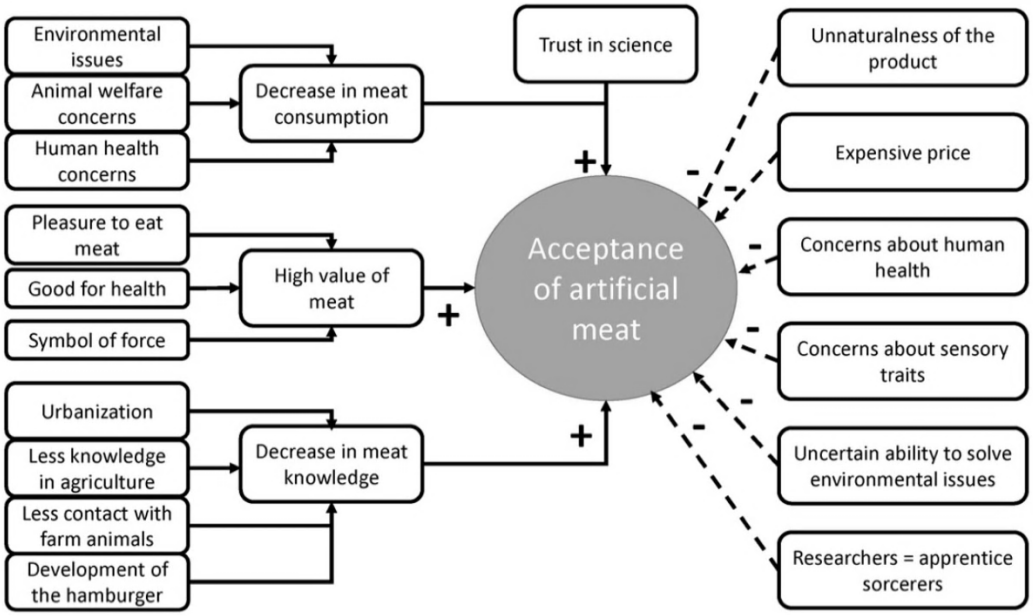

Figure 2 - *Driving forces in favour (+, full lines) or against (−, dotted lines) acceptance of cultured meat [Source: Hocquette, (2016), p. 169].*

In line with Hoquette's research, Pakseresht, Kaliji and Canavari (2021), conducted an extensive review that highlighted eight major interconnected themes found to be critical factors for consumer acceptance of cultured meat. These being:

- public awareness;

- knowledge about cultured meat characteristics and production processes;
- food-related risk-benefit perception;
- ethical and environmental concerns;
- emotions (sensory experience, i.e., taste, smell, texture)
- personal factors (i.e., gender, age, education, intercultural differences, personality traits and political views);
- product properties (i.e., price, effect of the product);
- availability of other alternative protein substitutes (plant-based or insect-based ones).

Additionally, consciousness, perceptions, and other personal characteristics emerged to be relevant when considering variables affecting consumer acceptance of cultured meat (Pakseresht, Kaliji & Canavari, 2021). In this regard, a considerable body of research has been conducted on the topic, with Siegrist and Hartmann (2020) providing an important summary of key factors influencing consumer perception when it comes to novel foods, such as cultivated meat. These factors are found to be related to personality-related characteristics, such as:

- food neophobia (i.e., fear of trying new foods);
- trust (i.e., trust in the food industry and its transparency in the production processes);
- food disgust (such as perceptions of unnaturalness or artificiality).

These three main elements play significant roles in influencing consumer acceptance of cultured meat by enhancing the perceived naturalness or by increasing disgust evoked by the artificial meat, as represented in Figure 3 (Siegrist & Hartmann, 2020).

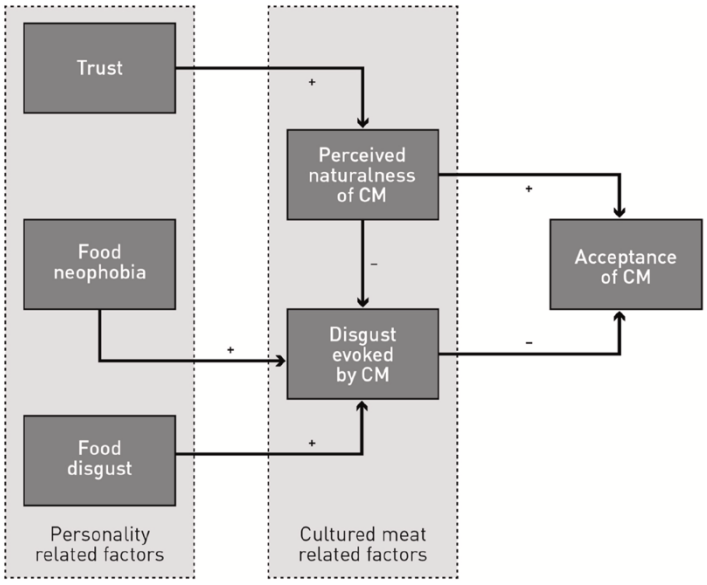

Figure 3 *- Siegrist and Hartmann (2020) model explaining acceptance of cultured meat (CM), including three personality-related factors: trust, food neophobia and food disgust and two mediators: perceived naturalness and disgust evoked by CM [Source: Siegrist & Hartmann, (2020), p.3]*

The above-described literature review highlights the complex interplay of factors influencing consumer acceptance of cultured meat. While safety and health concerns may present barriers to adoption, ethical and environmental considerations are often perceived as positive drivers. Consequently, it becomes evident that the ultimate success of cultivated meat hinges upon consumers' receptivity to integrating it into their diets, reflecting their willingness to transition in the foreseeable future. Therefore, understanding these factors and adapting strategies in accordance with them, would lead cultivated meat to gain a broader acceptance and integration into mainstream food markets (Siegrist & Hartmann, 2020).

In the next section, we aim to define the research gap inherent in this thesis and delve into the intricacies of the problem at hand, seeking a nuanced understanding of it. To achieve this, we will later draw upon theories related to business models and consumer experience value, endeavouring to construct a preliminary framework, suitable for adoption by companies within the cultivated meat sector.

2.3 Research Gap: Consumer Acceptance Drivers for CM and BMI

There is a lot of research that shows people's motivations behind meat consumption: individuals often justify their dietary choices based on the perception of meat as 'natural', 'normal' or 'nice', which significantly influences their consumption patterns. The decision to eat meat is often unquestioned given its established status as a habitual part of the diet,

particularly as the central piece of many main meals. However, it is important to acknowledge that also social norms surrounding alimentary behaviour are changing, and that collective efforts by civil society, health organisations, and government agencies – like anti-smoking or alcohol campaigns - can help to facilitate this transition in attitude (Godfray et al., 2018).

Historically, the diet has been slow to change because of interventions or new trends, but social norms can and do transform and implement new features, which eventually become mainstream and automatic for most people. As posited by Godfray et al. (2018), the aforementioned process might be enhanced by two strategies: fostering awareness of the health and environmental impacts of meat consumption and strengthening social commitment to implement interventions that would encourage behavioural change. It became clear that a further study on the individual actions of consumers and their demand drivers is necessary to comprehend the various social behaviours that influence actual and potential choices (Godfray et al., 2018).

Furthermore, there is a lack in the literature regarding the effectiveness of interventions aimed at altering individuals' conscious and unconscious food shopping and consumption habits, since the subjectivity of those behaviours makes it challenging to construct a clear theoretical framework. Indeed, to explain the importance of transitioning to a more diverse diet that would include alternative meats like cultivated meat, at a public level, companies should invest in understanding customers' perceptions as well as increasing public awareness of these new alternatives (Godfray et al., 2018). This requires proactive communication about the science behind cultivated meat and the reasons why individuals will have to balance their diet with this alternative, e.g. environmental challenges, and population growth implications. Companies operating in this field often have concerns about profitability while maintaining sustainability, highlighting the need to carefully consider business model innovations (BMI). This calls for a reconsideration of customer demands, resource allocations, and other necessary skills required in a business that differs from the traditional meat industry.

In this context, our thesis aims to fill a significant gap in the existing literature by approaching the research problem from a business model perspective, particularly focusing on the Value Proposition, Customer Segments, and Customer Relationships elements of the business model canvas. Specifically, practical strategies are lacking; therefore, we aim to elucidate the factors driving customer acceptance that could help in transitioning towards widespread adoption.

2.4 Addressing Societal Acceptability and Perceptions: Human Decisional Role

It is important to note that there are still considerable gaps in the comprehension of the societal acceptability and broader implications of cultured meat, despite its potential to reshape the landscape of meat production and consumption. This is particularly relevant given the presence of human biases and preconceptions that hinder cultivated meat acceptance among people (Godfray et al., 2018; and Siegrist & Hartmann, 2020).

To navigate these complexities, Godfray et al. (2018), developed a conceptual framework based on a dual-process theory, which provides a lens through which to examine strategies for altering meat consumption patterns. This theory acknowledges the presence of both conscious deliberative, or reflective, processes and nonconscious, or automatic, decisional processes. These arise from situational factors, environmental considerations, and other personal traits (Godfray et al., 2018). These factors are highlighted by the research as they can be leveraged to understand firstly the drivers of meat consumption and secondly to infer the most suitable interventions to target both reflective and automatic decision-making. Nutritional labelling and fiscal measures, such as taxation, could be employed as interventions to mitigate meat consumption or to foster a shift towards meat alternatives. According to the researchers, interventions addressing unconscious processes aim to be more subtle in steering consumer behaviour away from traditional meat products. These latter are based on environmental cues that are effective as they nudge people into automatically taking an alternative without necessitating explicit decision-making (Godfray et al., 2018).

Nevertheless, ethical considerations pertaining to the manipulation of consumer behaviour and concerns regarding the effectiveness of these potential interventions highlight the necessity for rigorous empirical investigation to gain a deeper understanding of consumer responses to alternative meat products and how to guide the future production of cultured meat.

In conclusion, addressing the aforementioned gaps will require a collaborative effort on the part of companies to address the complex interplay between technological innovation, consumer perceptions and socio-political dynamics within the European context. In this regard, the development of a novel business model framework represents a crucial element in this endeavour.

2.5 Navigating Business Model Innovation in the Cultivated Meat Sector

This literature review seeks to address a critical gap in the existing research, particularly with regard to the adoption of new business models in emerging industries, such as the cultivate meat one. This is evidenced by the lack of comprehensive guidance for both start-ups and established conventional meat companies seeking to innovate their business models to adapt to this new landscape, which is yet to reach mass commercialization. Due to the nature of this disruptive and novel sector, start-ups and established companies strive to commercialise their products, not only for regulatory reasons (e.g., in certain countries, the commercialisation of such products is prohibited), but also due to the high cost of producing and selling cultivated meat. Therefore, it is important to better understand business model innovations and how these can capture value for new potential targeted customers. However, it is first necessary to have a clear understanding of the challenges involved in developing a business model that will promote consumer adoption of cultivated meat.

We decided to employ a business model approach to tackle the research problem, as it encompasses the various elements relevant to both start-ups and established traditional meat companies operating within the lab-grown meat domain. This approach facilitates a comprehensive strategic perspective, given the difficulty of developing a flexible and adaptable business model in an environment with many constraints and uncertainties such as this one (Stephens et al., 2018).

The objective is to assist executives in the structuring of their business model, particularly given the absence of a clearly defined business model for companies or start-ups in this sector (Amit and Zott, 2012). In addition, Lanzoni et al. (2024), highlighted the lack of studies investigating potential markets for cultured meat, due to its inherent complexity. Therefore, the objective is to address this gap by conducting a comprehensive analysis, utilising data on consumer attitudes from European countries. As a matter of fact, we prioritised European countries, as they represent 40% of the main cultured meat companies and will help identify receptiveness; thereby enabling an understanding of the factors influencing consumer choices in these regions (Lanzoni et al, 2024 and Ye et al., 2022).

2.6 Theoretical Framework

2.6.1 Business Model Theory and Key Components

As we dive into the dynamics of the cultivated meat industry, it becomes evident that traditional business models may not be sufficient in the face of disruptive technologies and changing consumer preferences. Chesbrough (2019) emphasises that the capacity to innovate business models is crucial for companies seeking to capitalise on new technologies and navigate the complexities of market entry and sustainability. He posits that a technology that is merely mediocre when employed within a well-designed business model may be more valuable than a technology that is highly sophisticated when deployed via a less effective business model (Chesbrough, 2019). This observation underscores the pivotal role of strategic business design.

According to Osterwalder, Pigneur and Tucci (2005), a business model is a conceptual framework comprising interconnected elements that articulate the operational logic of a particular enterprise (see Table 1). To gain a better understanding of what a business model is, Chesbrough and Rosenbloom (2002) delineate it as the way in which businesses articulate their value proposition. This includes the value offered to users by adopting their technology; the targeted market segment they want to reach, the revenue they hope to achieve; and the value chain required to create and distribute the product or service. Additionally, estimates on the cost structure to maintain and obtain an economic profit are necessary elements as well. To summarize, companies need to describe their position in creating value and how to link suppliers to customers by adopting a competitive strategy that enables them to maintain an advantage over their competitors (Chesbrough & Rosenbloom, 2002). As stated by the authors, the development and the commercialisation of new technologies are crucially dependent on a new business model (entirely new or novel constituents of it), which can determine the success or failure of an offering. The use of tools such as Alex Osterwalder's Business Model Canvas (Osterwalder, 2004) can illuminate how to innovate or how to construct business models by clarifying the roles of different business components and their interrelationships, as shown in Table 1.

Table 1 - Osterwalder's 9-point decomposition of a Business Model [Source: Osterwalder, Pigneur & Tucci, 2005, p.19]

Category	*BM Building Block*	*Description*
Product	**Value Proposition**	Provides a broad view of a company's bundle of products and services.
Customer Interface	**Target Costumer**	Describes the various segments to which a company wants to deliver value.
	Distribution Channel	Explains the means of a company to reach its customers.
	Customer Relationship	Defines the kind of links a company establishes between itself and its different customer segments.
Infrastructure Management	**Value Configuration**	Discusses how activities and resources are arranged.
	Core Competency	Defines the skills required to carry out the company's business strategy.
	Partner Network	Demonstrates the network of joint agreements with other companies.
Financial Aspects	**Cost Structure**	Summarizes the financial effects of the means employed in the business model.
	Revenue Model	Describes the various revenue streams used to generate income.

This 9-point decomposition framework is a useful tool to highlight the 'components or building blocks', which are fundamental in configuring a business model. With the aid of this modelling framework, businesses can proactively investigate alternative business models and test different scenarios through simulations prior to making real investments. Moreover, by visually configuring elements of a business model through visualization aids, could serve in elucidating the underlying processes of the business activity. Thus, theoretical considerations can be transformed into actionable strategies for innovation and experimentation (Osterwalder, Pigneur & Tucci, 2005). In the context of this thesis, companies must direct their attention, especially towards refining the elements of the value proposition, customer segmentation and customer relationship management. This necessitates a comprehensive examination of market dynamics, consumer behaviours and societal trends to calibrate the aforementioned BM building blocks to effectively address emerging consumer demands and expectations. This would help meat companies realign with customers' needs and foster long-term customer loyalty within the cultivated meat emergent landscape.

It is important to mention that this tool can be useful for explaining a business model in depth, however, it must be implemented along with other concrete actions to promote innovation and experimentation within the model.

2.6.2 Innovating Business Models in the Cultivated Meat Industry

In light of the necessity for business model innovation, established meat companies seeking growth and long-term sustainability may consider investing in cultured meat options with the aim of expanding their operations. This is consistent with the findings of Amit and Zott (2012), who posit that lab-grown meat could be viewed as a means of enhancing and complementing existing offerings, rather than as a substitute for traditional meat products. This approach appears particularly relevant in the near future as a preliminary approach to the meat market. In this context, start-ups or established companies may address the challenge of entering a new market with no guaranteed way to obtain and/or increase profits. A significant benefit for larger companies is that they may encounter fewer difficulties in identifying the necessary investments and potential partners due to their established reputation (Amit & Zott, 2012). Over time, smaller companies may benefit from increased adoption of meat alternatives by trusted larger partners, which could successively lead to increased recognition and adoption of the new business model by other companies. This allows companies to create and exploit new opportunities, such as lab-grown meat products, within an existing market. Therefore, Business Model Innovation (BMI) can help companies stay ahead in the 'innovation game' (Amit & Zott, 2012), which could lead to sustainable performance advantage in the future.

In the context of cultivated meat, the activities included in the BM could include, among others: research and development of cell-based technologies, sourcing of the media and other raw materials needed to grow the tissues, manufacturing the cultivated meat products, establishing the distribution networks, and marketing the target customers. These activities are particularly feasible once the commercialisation process begins to unfold.

Given the disruptive nature of the market, the parties involved should exhibit a clear alignment and willingness to collaborate. This is particularly important when considering the cell culture research and development activity, which will require partnerships with biotechnology firms. Moreover, partnerships with agricultural suppliers and other third-party agreements with retailers are likely to emerge in order to facilitate the production and distribution of these products. The interconnectivity of these elements is crucial as relationships with external parties necessitate the implementation of more rigorous ethical sourcing

practices, the maintenance of quality standards throughout the production process, and the establishment of trust and transparency with consumers regarding the safety and sustainability of meat products.

When evaluating BMI within the lab-grown meat sector using Amit and Zott's (2012) framework, the focus is directed towards three essential design elements: content, structure, and governance. Content refers to the addition of new activities to an existing business model. In this thesis' case, this could include incorporating sustainable sourcing and production practices, implementing new product technologies, or diversifying the range of lab-grown meat products. Structure refers to the manner in which those activities and processes are interconnected. Such modifications could include optimising the supply chain logistics and forging key partnerships to ensure efficient production and distribution, while maintaining low costs. Governance involves changes in one or more parties that perform the activities, it is about considering the roles and responsibilities within the firm and the external relationships with stakeholders such as regulatory bodies, industry players and research institutions. An appreciation of how the various elements of a business model design interact is of paramount importance. Modifying one component of the model will invariably result in changes to the whole, as the model itself serves as a basis for capturing and delivering value for a company (Amit & Zott, 2012). It must be noted that to innovate a BM a holistic or systemic approach to thinking is required. Additionally, managers must carefully consider the broader ecosystem in which their company operates. As outlined by Nidumolu, Prahalad and Rangaswami (2009), the construction of a new business model entails the exploration of alternatives to the prevailing modes of business conduct, as well as an understanding of how companies may meet the needs of their customers in a manner that is distinct from the current paradigm. From this definition, it is clear that the foundation of embracing innovation is the capacity to question and understand customer perceptions.

2.6.3 Cognitive Barriers and Innovation Dynamics in BMI

Drawing upon Christensen's theory of the Innovator's Dilemma, the conflict between established business models and the need to exploit a new one can disrupt a company's attempt to conceive an innovation. These conflicts arise when the technology used or the offering is emerging and yet to obtain recognition in the market (Birnbaum, Christensen & Raynor, 2005). It is worth mentioning that the end customer, - in this case, the original meat consumer, and the

new cultivated meat consumer - may differ, therefore different distribution channels need to be established in each case.

A key aspect of this thesis is the examination of cognitive barriers to business model experimentation, a concept first articulated by Chesbrough and Rosenbloom (2002). They posit that the enduring success of a business model that has already gained popularity influences the available information in the market, which in turn can restrain the adoption of new corporate decision processes or other practices that are not inherent to the prevailing business model.

This cognitive inertia can be particularly challenging in sectors such as cultivated meat, where the advent of new models is essential to disrupt established industries such as dairy and traditional meat production. Industries that have successfully adopted new business models (e.g., non-dairy products, plant-based meat substitutes and meal-kit delivery services) offer valuable case studies for cultured meat companies. These illustrate how overcoming entrenched business practices can lead to successful market entry and growth, providing a model for companies navigating the nascent cultured meat market. Chesbrough (2010) suggests that overcoming these barriers requires committed experimentation and proactive exploration of emerging markets with new offerings. This proactive engagement allows companies to gather new data ahead of their competitors, enabling them to better understand and capitalise on market dynamics.

To be more practical in experimenting, Sarasvathy (2008) suggests that entrepreneurs should focus on acting and creating their future market niche rather than relying on predictions and extensive planning. This approach is based on '*effectuation reasoning'*, a type of human problem-solving method particularly applicable in cases characterized by unpredictability and uncertainty due to contextual variables. As such, it is also relevant in the case of cultivated meat companies, given that the future is still uncertain, and it is a challenging task to plan thoroughly as sufficient data is not yet available. In Chesbrough's words: "Without action, no new data will be forthcoming" (Chesbrough, 2010, p. 361). Such action is crucial also for overcoming the cognitive barrier of reframing the dominant logic of the established business model.

Managers can map currently existing and prospective business models in order to facilitate experimentation, which may result in organisational change. It is also necessary to consider how this kind of environment can be fostered.

Chesbrough (2010) advocates that organisations adopt an experimental mindset and embrace the concept of 'affordable loss', which encourages the taking of calculated risks in order to achieve positive outcomes. By financial forecasting and discovery-based planning,

organisations can effectively model uncertainty, encouraging the development of innovative business models. This approach is essential for leaders in all sectors, urging them to foster a culture of experimentation, whether their organisations are start-ups entering the mature meat market or established companies diversifying into new sectors. For traditional companies exploring innovative markets, it is crucial that the organisational culture is receptive to new business models and avoids the pitfalls of strict adherence to legacy systems, which can stifle innovation (Chesbrough, 2019). According to Zhang & Zhang (2019), the purpose of business model innovation is to establish an innovation path that diverts from a traditional business model, specifically aiming at targeting customers' needs. This requires the formulation of a reasonable market forecast and the implementation of accurate enterprise resource mobilisation, which are key factors of a business model.

2.6.4 The Need for a Customer-Centric BMI in the Cultivated Meat Industry

Johnson, Christensen and Kagermann (2008) describe a business model as four interrelated elements that together create and deliver value. The Customer Value Proposition is one of these elements and it is particularly relevant for this thesis as it entails the study of the targeted customer, it explains the 'job to be done' to solve a problem/need of a specific targeted individual and the offering satisfying it. The other elements are the Profit Formula, which concerns how the business creates value, considering the revenue model and the cost structure; the Key Resources, which are the necessary elements to deliver the customer value proposition (i.e. people, technology, equipment, information, channels, partnerships etc), and the Key Processes, which are the operations, rules, metrics and norms needed to make the offering scalable (Johnson, Christensen & Kagermann, 2008). In order to create a customer value proposition that appeals to the right people, it is vital to conduct extensive research to understand the underlying attitudes and perspectives of potential target customers.

In the context of the cultured meat industry, research has found that involving customers in the value proposition design process is a key factor in shaping a company's business model according to customers' food purchasing behaviour as it could help in understanding the drivers of the demand and willingness to try (Martinovski, 2016).

However, Troy and Kerry (2010) note the challenge of objectively measuring consumer perceptions of meat quality, suggesting that the industry needs to remain agile and responsive to customer and market signals. Integrating these insights into business model innovation not only drives sustainable growth, but also can help secure a competitive advantage. Furthermore,

Wirtz (2019) argues that in dynamic environments where change occurs rapidly and unpredictably, business model innovation cannot rely solely on planned processes. This unpredictability requires a flexible and adaptive approach to business strategy and development, particularly in frontier markets such as cultured meat, where traditional forecasting methods may fall short.

According to Sarasvathy and Kotha, (2001), established businesses should also consider adopting an approach based on the 'effectuation theory'. This framework is based on the existing business model as an initial means to create a new future alternative. By relying on partnerships and a logic of control, the established businesses will transform the existing conventional meat market into a new market (Sarasvathy & Dew, 2005). In this way, the cultured meat industry can be more closely related to the traditional meat industry. This is particularly relevant for companies that are willing to explore niche markets as a secondary or additional business venture (Sarasvathy, Kotha & Hall, 2001).

In this evolving landscape, the significance of collaborative partnerships and co-creation becomes increasingly important. As noted by Karami, Baber and Ojala (2022), these elements are essential to navigate the collective nature of business model innovation and enable firms, particularly smaller ones, to manage the uncertainty inherent in emerging markets. They emphasise that "action in effectuation theory plays a central role in being proactive in dealing with uncertainty" (Karami, Baber & Ojala, 2022, p. 11), suggesting that a proactive, participatory approach to business model innovation can act as a strategic tool rather than simply an adaptive measure (Rindova & Courtney, 2020).

2.6.5 Customer Experience-Driven Business Model Innovation

Building on these insights, Keiningham et al. (2021) propose a framework for business model innovation driven by customer experience (CX). This framework can help companies align customer perceptions and needs with firm requirements. Given that cultured meat is a new and dynamic market, this approach could be useful for adjusting the business model according to the driving factors for cultivated meat acceptance.

The researchers identified the dimensions of customer experience, namely cognitive, physical, sensory, emotional, and social factors, as the primary levers connecting it to business model innovation (BMI). The outcome of their work was a three-step process (see Figure 4).

- **Step 1**: Create a Customer Experience profile through 'CX Profiling'. This covers the cognitive, emotional, physical, sensorial, and social elements that shape

customers' interactions, all considered to be pivotal especially when considering launching a new product. Furthermore, it is crucial to consider competitive or substitute comparisons when shaping customers' perceptions.

- **Step 2**: Develop a Strategic Orientation profile. This involves identifying the company's strategic orientation and understanding its implications for changes to the business model. According to Mintzberg et al. (1998), this is about setting a general direction, defining market opportunities, and providing a clear orientation for long-term competitive advantage.
- **Step 3**: Align customer experience (CX) to strategic orientation (SO). Managers aim to look for opportunities to differentiate the customer experience by answering key questions ('what', 'when', 'who', 'why' type of questions). This alignment ensures that business model innovations are adjusted with the desired customer experience and the strategic goals of the company.

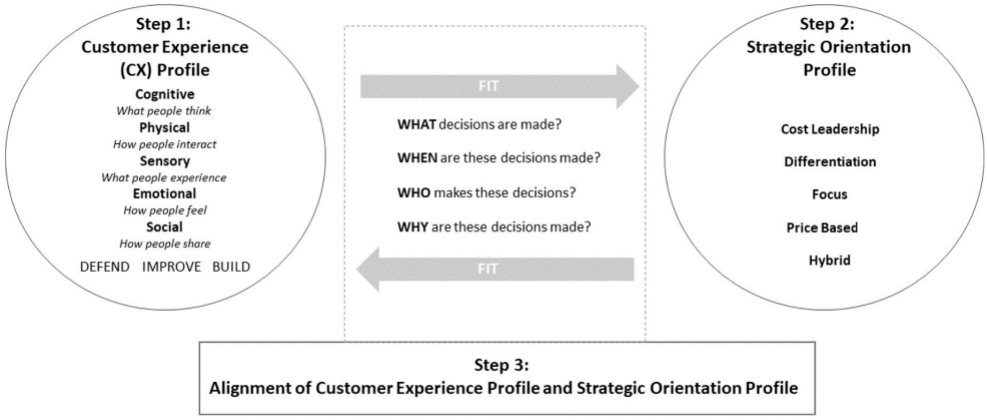

Figure 4 - *Customer Experience Driven Business Model Innovation - CX-BMI Framework, [Source: Keiningham et al., 2021, p.433]*

The incorporation of these steps into managerial practice could enable businesses to effectively identify and align customer experience and business model innovation. Consequently, the creation of opportunities that enhance customer value guides strategic decision-making processes in the cultivated meat market (Keiningham et al., 2021).

In the context of disruptive innovation in the field of cultivated meat products, it is crucial to understand the relevance of the customer experience. Therefore, managers must prioritise the creation of a superior customer experience by understanding the factors that enhance customer experience quality (Hyunsik et al., 2013). In conclusion, this literature review highlights the fundamental significance of business model theory in managing the intricacies

of entering new markets. This is especially relevant for start-ups and established companies exploring the emerging field of cultivated meat.

Our aim is to connect theory with empirical insights to understand the nuanced perspectives and preferences of potential customers in the cultivated meat industry. To understand the drivers of customers' demand in this novel and uncertain context this thesis has the purpose of understanding the factors affecting customers' attitudes toward lab-grown meat products and the complex interplay of those variables (see Preliminary Framework section 2.8). By synthesising these findings, we aim to provide practical recommendations for companies looking to create custom business models that are tailored to the demands of this changing market landscape.

2.7 Harnessing Resilience and Innovation: The Path Forward in Cultivated Meat Business Models

In conclusion, the importance of achieving business model innovation is indisputable. Nevertheless, this remains a challenging task. Several studies have investigated the role of business model innovation in the food sector specifically, emphasising the necessity for a transition from a producer-oriented perspective to a more entrepreneurial and customer-oriented perspective (Tell et al., 2016, 2020). This transition is of particular importance in the context of disruptive technologies, such as lab-grown meat, which necessitate the development of new value propositions, creation processes, and delivery methods (Nosratabadi, Mosavi & Lakner, 2020). Furthermore, these studies demonstrate the necessity of considering a number of various factors, such as environmental factors, social movements, and urban conditions on the level of advancement of business model innovation, (Nosratabadi, Mosavi & Lakner, 2020). In light of the aforementioned explanation, a key attribute is beginning to be considered relevant in the adoption of resilience thinking among entrepreneurs and companies.

Resilience thinking is a crucial skill that entrepreneurs and companies should foster to sustain their presence in a particular industry (Folke et al., 2010). Three interrelated aspects are essential in this regard: resilience, adaptability, and transformability. *Resilience* involves the capacity to continually change and adapt while remaining profitable. Recovering from a setback or handling a one-time crisis are not the goals of strategic resilience. It involves constantly recognizing and responding to long-term, significant developments that have the potential to permanently reduce a core business's earning potential; adapting before the need for change becomes apparent. *Adaptability* is inherent to resilience, and it involves being

responsive to changing external drivers and internal processes to foster continued development along a current trajectory. Finally, *transformability* is the aptitude to overcome thresholds and combine elements from different areas into new development trajectories (Folke et al., 2010).

Resilience is the result of persistent effort to overcome obstacles, including cognitive obstacles, strategic obstacles, political obstacles, and ideological obstacles (Hamel & Välikangas, 2003). As the world becomes increasingly turbulent at a faster rate than companies become more resilient, as Hamel and Välikangas (2003) suggested, to achieve resilience, companies — both start-ups already in the market and those facing the potential disruption of cultivated meat — must overcome a series of challenges. Indeed, to manage social-ecological transitions, the ability to transform at a lower scale draws on resilience across various levels.

Hence, it is of utmost importance for companies to leverage these crises and disruptive innovations as windows of opportunity for novelty and invention and recombining sources of experience and knowledge (Folke et al., 2010). It can be concluded that companies must integrate resilience as an automatic process and as part of their operational efficient strategies. This should be done by allocating energy and resources and adopting a 'perpetual renewal' modus operandi, to overcome those obstacles.

2.8 Preliminary Framework

The following preliminary framework is based on the extensive review of the literature on Business Model Innovation (BMI), focusing in particular on the fundamental elements of Value Proposition, Customer Segmentation and Customer Relationship. The primary objective of this thesis is to examine and analyse the critical determinants influencing the acceptance and prospective diffusion of Cultivated Meat (CM) products. In order to achieve this, a framework has been developed, that attempts to help companies in developing tailored and innovative business models that effectively address those determinants. Consequently, this framework can be applied in the general case where companies are required to adapt as their novel product is to be launched in existing or emerging markets.

At the heart of this endeavour is the recognition of evolving consumer preferences, which requires a deep understanding of the drivers that shape demand for CM products. The framework aims to illustrate the relationships between the different components and emphasize the importance of customer preferences. Additionally, it is also of great importance to identify and assess the barriers to widespread adoption from a consumer perspective. From an organisational standpoint, it is equally important to explore the dynamics of innovation and

customer experience, as these factors are critical to effectively engaging meat consumers. By adopting innovation practices and strategies in a customer-centric approach, we aim to transform the previous challenges into actionable strategies that enhance customer experience (CX) that companies can adopt to innovate their business models.

The forthcoming analysis aims to provide valuable insights into the available pathways for companies to successfully innovate their business models.

The framework presented here thus serves as a guiding structure for the subsequent analysis. The selection of relevant theories emphasises the theoretical frame of our research question and is in alignment with the broader rationale of the study. The process is iterative as there are feedback loops to consider, highlighting that innovation influences and is influenced by consumer behaviour. It is important to highlight that this framework is a preliminary step, and by no means is definitive; rather, it provides a foundational basis for further exploration and refinement.

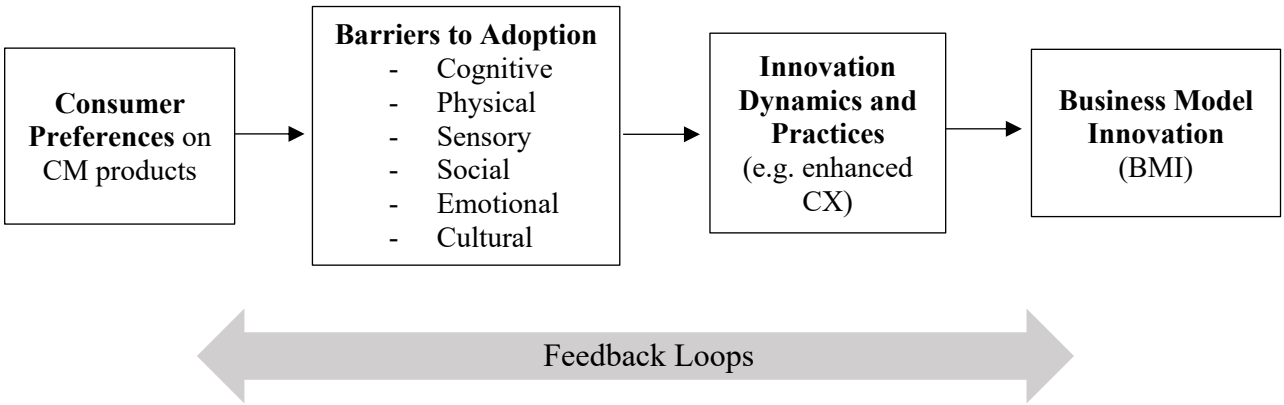

Figure 5 *- Preliminary Framework for determinants of CM adoption among consumers and to adopt a proper approach for BMI.*

3 Methodology

This chapter outlines the methodology chosen to address the research questions and fulfil the thesis' objectives. Firstly, the rationale behind the selected research design is presented, highlighting its advantages and limitations. Subsequently, the approach used for data collection is described, including the motivation for selecting the specific industry and practical case start-up. In the following section the process of data analysis is discussed, explaining the steps taken to transform the collected data into findings that address the predefined research questions and the business case. Finally, the validity, reliability, and ethical considerations are evaluated to assess the overall quality of the study.

3.1 Research Approach and Design

As Creswell (2014) asserts, the nature of a specific research problem determines the most appropriate approach, thereby, since our research questions are linked to both topics a qualitative and quantitative method has been employed. According to Creswell, a quantitative approach is the most appropriate to use when a problem calls for the identification of factors that influence an outcome or for understanding the best predictors of determined outcomes (Creswell, 2014). Conversely, a qualitative method is more appropriate to use when a topic requires further investigation as only a few studies have been done on it due to its novelty (Creswell, 2014). This is pertinent to this study, as our objective was to identify the key factors influencing consumer acceptance of cultivated meat, an emerging industry, for which there is currently limited data, in order to then develop strategies applicable in a wider context.

Therefore, given the nature and novelty of the research problems, we deemed it appropriate to adopt a mixed methods design.

It is evident that the comprehension of the market necessitates straightforward questions, whereas research directed at companies and their business model operations is more complex. Consequently, we have opted for a quantitative approach employing a survey, to understand the market, and a qualitative approach based on interviews, to comprehend the business model development challenges. Additionally, by integrating qualitative and quantitative data, the research can provide both theoretical and practical insights that are particularly relevant to this rapidly evolving field.

The study's research questions are broad, encompassing both how trends in consumer behaviour and attitudes across European countries determine future acceptance of lab-grown meat (demand side perspective), as well as the opportunities and challenges associated with the introduction of cultured meat from a business model perspective (supply side perspective).

The central issue addressed is the identification of consumer segments that companies should target, based on the factors driving their attitudes. It is recommended that companies innovate their business models in order to satisfy the targeted consumers. This problem is significant as it entails several variable conditions, including shifting consumer behaviour and the acceptance of radical innovations, while dealing with external contingent factors affecting the cultivated meat industry. With the purpose of enhancing the theoretical basis of our research, we conducted a detailed review of the literature.

On one hand, we applied business model theory to understand the relevance of customers in building a customer value proposition that suits their preferences. This was done to assist companies in developing a more effective business model, as exemplified by the case of the start-up Re:Meat, which was presented to illustrate how a company can tackle this market. Indeed, by leveraging qualitative methods, we gained a comprehensive understanding of the opportunities and challenges within the cultivated meat sector; for this, an extensive literature review of the cultivated meat sector has been conducted.

On the other hand, the questionnaire was employed to study and capture contextual insights of the demand side. This was achieved through the use of both open-ended and closed-ended questions, which enabled the entanglements of associations typical of customers' personal choices to be elucidated. Consequently, a series of statistical analyses were conducted among numerical close-ended answers (i.e., segment analysis, Chi2 analysis, ANOVA, correlation analysis) in order to analyse the interdependencies among the variables considered in our survey (see Data Analysis section 3.4.1). This methodology was necessary due to the inherent subjectivity of human behaviours and values, which are not easily quantifiable as they do not always exhibit a discernible pattern. The decision to employ qualitative research was conditioned by the evolving nature of the industry, which is shaped by a multitude of stakeholders with varying viewpoints.

In conclusion, combining qualitative and quantitative data concurrently enabled a more comprehensive understanding of customers' experiences and attitudes. As also stated by Creswell and Plano Clark (2007), the concurrent mixed method approach delivers a greater overall strength of the study, thereby enriching the study's findings and implications.

3.2 Data Sources

The data for this study were obtained from multiple sources to ensure a thorough understanding of the research topic. Primary and secondary data sources were utilised. The former category encompasses original data collected directly from the source or through first-hand observations, such as interviews, case studies, observations, and surveys. In contrast, the latter category encompasses data already collected and processed by another individual, typically published in scientific papers, books, journals, reports, websites, and databases. The data is then analysed and interpreted in the context required (Creswell, 2014 and Saunders, Lewis & Thornhill, 2023).

Following the mixed methods approach, qualitative data was combined with quantitative data. Our primary data sources involved interviewing a start-up, Re:Meat, while a quantitative survey was conducted across European countries to gain insights into consumer attitudes (see section 3.3. Data Collection). As for secondary data sources, we consulted industry reports, academic literature, and publicly available data from organisations, such as the Good Food Institute website. By triangulating data from these diverse sources, this thesis aims to provide a vigorous analysis of the adoption of cultivated meat and its ramifications on this industry.

In order to contextualize our study and refine the survey development process, an exhaustive search was conducted across reputable databases, including ResearchGate, Elsevier, Scopus, and Google Scholar. We employed keywords such as ‘cultured meat’, ‘consumer attitudes’, and ‘business model innovation’ for our research. This approach guaranteed a strong exhaustive basis for our research methodology and survey design, as the literature review serves as a fundamental component in the shaping of a thesis (Creswell, 2014).

As previously stated, the case study of Re:Meat, a Swedish start-up headquartered in Malmö, constituted a primary source of empirical evidence. As described by Stake (1995) and Creswell (2009), “a case study is a strategy of inquiry in which the researchers explore in depth a program, event, activity, process or one or more individuals” (Creswell, 2014, p. 30). This company was selected for its pioneering role in cultivated meat production in Europe; indeed, it is the first cultivated meat company in Sweden and one of the first start-ups in the cultivated meat industry in Europe. Its relevance has recently been confirmed as it has been recognised as one of the top 10 start-ups in the Nordics for clean-tech companies in the food sector (Re:Meat, April 2024).

The objective of the chosen sources was to facilitate the integration of both empirical results and practical inferences derived from the survey data, to enhance our understanding of the

cultivated meat landscape and its customers' willingness to accept lab-grown meat in their diets. The identified literature gap highlights the necessity for further studies about customer acceptance factors and the strategies that companies must adopt to accommodate the change.

In essence, the integration of primary data adds value to the existing secondary data sources, in line with the observations put forward by Bernard (2018). This enabled us to gain a more nuanced comprehension of the perspectives of industry stakeholders and thus facilitated a deeper exploration of the preliminary framework. Indeed, the combination of this information with the data obtained from the concurrent analysis of the survey results proved fruitful, enabling the development of strategies within the meat industry.

3.3 Data Collection

In order to gain a comprehensive understanding of the evolving landscape of the lab-grown meat industry, our study was carefully structured to incorporate both primary and secondary research methods. Primary research was conducted via an online survey and supplemented by a case study interview, while secondary research involved an in-depth review of relevant studies conducted in the field.

3.3.1 Primary Data

i. Survey

The methodology of this study was designed to capture a broad spectrum of consumer attitudes towards cultivated meat, including elements such as willingness to adopt, payment flexibility, and dietary habit adjustment (See Survey Questions in Appendix 9.1). The research was conducted using a structured online questionnaire administered via Google Forms. This digital platform was chosen for its accessibility and ease of use, enabling the collection of both qualitative and quantitative data through open-ended and closed-ended questions. The questions were designed to measure the level of agreement or disagreement with statements related to cultivated meat and to explore consumers' beliefs, habits, and preferences. Moreover, demographic data, such as gender, country, and age, was collected to contextualise responses and enable a nuanced quantitative analysis. This approach ensured that the findings could be segmented and analysed according to diverse demographic bases (Schatz, 2003). Here's how each category of questions contributes to the research objectives:

Table 2 - Questions and Research objectives

Questions	Research objectives
Demographic Information (Gender, Age, Country of Residence)	Used to contextualise the responses and enabled the analysis of data based on demographic variables (Chi2, ANOVA…). Understanding demographic influences is crucial as it allows for an examination of potential differences in attitudes across various groups, which can be pivotal for targeted strategies.
Dietary Preferences (e.g., omnivore, vegetarian, vegan)	Essential to gauge the current market segments and their openness to cultivated meat. This directly ties into the research question regarding consumer willingness to adopt new protein sources and helped identify which segments might be more receptive.
Awareness of Environmental Impact	Used to determine the level of education among the consumer base and potentially correlating this awareness with a willingness to switch to more sustainable options, such as cultivated meat. This understanding is directly linked to the research question and addresses the factors that influence consumer decisions regarding cultivated meat.
Frequency of Meat Consumption	Used to determine how often respondents would consume traditional meat, to better understand their dependency on meat and how open they might be to substituting it with cultivated meat. This relates directly to exploring the market potential for cultivated meat among different consumer groups.

Knowledge and Willingness to Try Alternative Protein Sources	To assess familiarity and openness to various alternative protein products, including cultivated meat. Responses provide insights into current consumer trends and potential acceptance levels, informing strategies to enhance consumer education and acceptance.
Initial Reactions and Willingness to Pay for Cultivated Meat	After providing respondents with a brief explanation of the benefits of cultivated meat, their willingness to try and pay a premium for these products is explored. This helped to assess the immediate impact of targeted information on consumer perceptions, a critical aspect of market introduction strategies for new products.
Barriers and Motivations	Allowed the understanding of the specific barriers to adoption and motivations (e.g., environmental sustainability, animal welfare), it helped in crafting messages that resonate with consumer values and address their concerns, directly informing the development of effective marketing and educational content.
Future Vision and Time Span	Used to assess public expectations on the adoption of alternative proteins over the next decade, provided insights into market trends and consumer sentiment towards evolving dietary habits. Simultaneously, those questions gauged how quickly households anticipated integrating cultivated meat into their diets, offering a perspective on consumer readiness and the expected timeline for significant dietary shifts.

The primary aim was to reach end-users from various European countries, particularly those who traditionally consume meat, and also those who prefer alternative protein sources. To enhance inclusivity, the survey was made available in several languages, including French and Italian, thereby broadening the potential respondent base across different nationalities.

The questionnaire was divided into two main sections. The first section focused on collecting baseline data on personal demographics, dietary preferences, and participants' existing awareness and openness to adopting cultured meat options. The second part of the survey educated respondents about the principles of cultivated meat and its potential benefits such as its ability to address animal welfare and environmental sustainability. This information was intended to provide respondents with an understanding of the topic, thereby facilitating more informed responses to the questions designed to explore their willingness to include cultivated meat in their diets, the conditioning factors influencing their decision, and their willingness to pay a premium for such products.

Prior to the distribution of the broader survey, an eight-participant pilot test was conducted to refine the questions and ensure clarity and effectiveness in data collection. The feedback from this pilot phase led to adjustments in the wording and order of certain questions to enhance comprehension and response accuracy. These modifications were deemed essential to enhance the clarity and effectiveness of the survey, thereby ensuring that the data collected were both reliable and relevant to the research objectives.

The distribution strategy involved a combination of social media outreach and word-of-mouth techniques, using personal Instagram accounts to maximise the reach. This method allowed access to an extensive network of potential respondents, including both direct followers and extended contacts through secondary sharing. Despite the inherent limitations in tracking the exact number of views and engagements due to the nature of social media interactions, this approach facilitated wide dissemination of the survey and captured a diverse range of opinions and perspectives.

A total of 205 responses were registered, providing a concrete measure of the active engagement. However, determining the exact population reach was complex due to the limitations of social media analytics, particularly the inability to track the passive viewers who saw the survey link but did not interact with it. Therefore, the total number of followers (969) served as a baseline for estimating reach, supplemented by a conservative assumption of subsequent sharing.

The convenience sampling technique employed allowed participants to self-select into the study based on their exposure to the survey through digital platforms. While this method

facilitated efficient and extensive data collection, it is recognized that convenience sampling is prone to sampling bias, potentially limiting the generalizability of the findings (Andrade, 2021). These limitations and their implications for the study's generalizability are duly acknowledged, ensuring that the research conclusions are interpreted with appropriate caution.

ii. Case Study

We interviewed Jacob Schaldemose Peterson, CEO, and co-founder of Re:Meat, the first Swedish start-up focusing on cultivated meat production. This interview offered first-hand perspectives on the challenges and opportunities associated with the adoption of cultivated meat, as well as the CEO's views on the upcoming future of the market (See Interview Questions in Appendix 9.2). The information gathered has been instrumental in identifying the most effective strategies that a company can adopt to navigate an uncertain business environment.

The interview was conducted as a one-time phone session of which the content was meticulously prepared in advance. The interview began with an introduction of our work, highlighting the purpose and scope of the discussion. The questions were prepared by us carefully, taking into consideration our theoretical framework and the findings gathered from the analysis of the survey. To encourage further exploration of the key points we wanted to deal with open follow-up questions were posed to delve deeper into additional topics.

We aimed to gain insights into three main areas: Re:Meat's business model development journey, with challenges incurred; the company's and the market's future perspectives, and we concluded with a comparison with our survey data and the company's practical insights (See Table 3).

The following table summarizes the areas of the interview and how they were constructed according to our theoretical preliminary framework. The main objective was to gain valuable insights into the challenges and opportunities for BMI within the context of cultivated meat products, therefore, this interview was a crucial part of our research, as it provided a practical example of the theoretical concepts discussed and tested.

Table 3 - Interview Questions and Research objectives

Questions	Research objectives
Re:Meat's BM journey	• Analyse potential struggles encountered by the company (in the context of Value Proposition, Customer Segmentation and Customer Relationship elements; of the BM), focus was on customers and their preferences; • Explore the company's strategic operations and market positioning.
Future perspectives	• Understand the prospective customer adoption trends and market challenges; • Insights into customer demands and technology advancements, as well as regulatory developments and financing barriers, to which the company had to adapt their BM accordingly; • Identify potential pathways for innovation in line with the customer-centric approach for BMI, and how they plan to overcome consumers' barriers to adoption, also referring to innovation practices to implement in the future (e.g., full transparency in production process).
Confront Survey Data	• Comparison of our survey data with the company's perspectives on customers' expectations to infer alignments or discrepancies;

	• Understand the factors influencing acceptance and diffusion of CM in the future (and obstacles); • Possible anticipated timeline for the inclusion of cultivated meat in the EU Novel Foods Union list, and CEO's view of time span needed to have CM on our plates.

In addition to the aforementioned objectives, the interview sought to identify specific challenges, unexpected developments, and missteps encountered by Re:Meat throughout their journey. The objective was to gain insights and grasp the broader dynamics of the cultivated meat industry.

3.3.2 Secondary Data

In designing the methodological framework for this study, we were aware of the potential biases inherent in our primary data collection strategy. To counterbalance this and ensure a robust analytical process, the need for secondary data became apparent. The inclusion of secondary data in our study serves several important functions. Importantly, it provided a broader context against which to measure our primary data, offering a benchmark of established research findings. A range of studies were reviewed, from critical perspectives on cultured meat in Nordic contexts to comparative analyses of consumer attitudes in different European countries (see Table 4). It is relevant to note that the use of secondary data not only increases the depth of analysis but also enhances the credibility and trustworthiness of the findings beyond what could be achieved with primary data alone.

Table 4 - Secondary Table Data

Author	*Title of the Paper*
Anouk Boereboom, P. Mongondry, L. K. de Aguiar, B. Urbano, Z. Jiang, 2022	Identifying Consumer Groups and Their Characteristics Based on Their Willingness to Engage with Cultured Meat: A Comparison of Four European Countries

Bryant, van Nek & Rolland, 2020	European markets for cultured meat: A comparison of Germany and France
Carlsson, Kataria & Lampi, 2022	How much does it take? Willingness to switch to meat substitutes
Dupont & Fiebelkorn, 2020	Attitudes and acceptance of young people toward the consumption of insects and cultured meat in Germany
Egolf, Hartmann and Siegrist, 2019	When evolution works against the future: disgust's contributions to the acceptance of new food technologies
Grasso and al., 2019	Older consumers' readiness to accept the alternative, more sustainable protein sources in the European Union
Hocquette et al., 2015	Educated consumers don't believe artificial meat is the solution to the problems with the meat industry
Klöcker et al., 2022	Milk, Meat, and Fish From the Petri Dish—Which Attributes Would Make Cultured Proteins (Un)attractive and for Whom? Results From a Nordic Survey
Mancini & Antonioli, 2019	Exploring consumers' attitude towards cultured meat in Italy
Mancini & Antonioli, 2020	To What Extent Are Consumers' Perception and Acceptance of Alternative Meat Production Systems Affected by Information? The Case of Cultured Meat
Onwezen et al., 2020	A systematic review on consumer acceptance of alternative proteins: Pulses, algae, insects, plant-based meat alternatives, and cultured meat
Post, M. J., 2012	Scientific, Sustainability and Regulatory Challenges of Cultured Meat
Rasmussen et al., 2024	Critical review of cultivated meat from a Nordic perspective

Rolland, Markus & Post, 2020	The effect of information content on acceptance of cultured meat in a tasting context
Shaw & Mac Con Iomaire, 2019	A comparative analysis of the attitudes of rural and urban consumers towards cultured meat
Siegrist & Hartmann, 2020	Perceived naturalness, disgust, trust, and food neophobia as predictors of cultured meat acceptance in ten countries
Siegrist, Sütterlin & Hartmann, 2018	Perceived naturalness and evoked disgust influence acceptance of cultured meat
Verbeke et al., 2015	'Would you eat cultured meat?': Consumers' reactions and attitude formation in Belgium, Portugal, and the United Kingdom
Verbeke, Sans & Van Loo, 2015	Challenges and prospects for consumer acceptance of cultured meat
Vinnari & Tapio, 2009	Future images of meat consumption in 2030
Weinrich, Strack & Neugebauer, 2020	Consumer acceptance of cultured meat in Germany

3.4 Data Analysis

According to Creswell (2014), the purpose of the data analysis is the segmentation and deconstruction of the data collected to make it meaningful.

3.4.1 Quantitative Data

The objective of this study is to examine consumer perceptions and behaviours towards cultivated meat within the European context. To this end, a comprehensive survey was conducted, the results of which were analysed in order to identify the influence of various demographic factors, including age, gender, country of residence and income, on consumer attitudes towards alternative proteins. Additionally, the study seeks to understand broader factors that influence the willingness to try cultivated meat, including environmental awareness, safety concerns and health perceptions (See Survey Questions in Appendix 9.1).

Prior to analysis, the dataset underwent a comprehensive cleaning process. This entailed the identification and rectification of any missing values, the assurance that all data types were correctly formatted, and the recoding of textual responses into numerical codes where necessary to facilitate statistical analysis. These steps were essential to prepare the data for accurate and efficient analysis. For the statistical analysis, Microsoft Excel was employed to conduct Chi-square and ANOVA tests, as well as to calculate correlation coefficients between various factors. The decision to utilise Excel was based on its accessibility, user-friendliness, and familiarity. Its capacity to process voluminous datasets and execute elementary statistical procedures, including correlation analysis, rendered it an optimal choice for our thesis. In order, to ensure the statistical relevance of our analysis we decided to apply the p-value method, where results with a p-value less than 0.05 were considered statistically significant, indicating strong evidence against the null hypothesis of no effect (See Results of Statistical Analysis in Appendix 9.3 and 9.4).

- *Segment Analysis by Demographic Variables*

The analysis commences with a focus on the principal demographic variables identified beforehand as crucial in influencing consumer attitudes toward cultivated meat: age, gender, country of residence, and income. The selection of these variables was based on their potential to significantly influence food consumption patterns and preferences. The segment analysis was particularly well-suited to this study, as it enables the identification of target groups that might benefit from tailored marketing strategies or product offerings. This, in turn, facilitates more effective communication and product development. In order to analyse the influence of demographic variables on consumer attitudes towards cultivated meat, both Chi-squared tests and ANOVA were employed. The selection of these tests was guided by the characteristics of the demographic variable in question and the type of data being analysed.

Chi-square tests were employed to assess the distribution of categorical data, including meat consumption frequencies and willingness to try cultivated meat. Cross-tabulation was employed to organise the data, enabling the observation of relationships between categorical variables and the display of frequency distributions across different categories. Following this, appropriate intervals were created to ensure that the expected frequencies were sufficient to meet the test's assumptions. This approach not only elucidates patterns within the data but also aligns with our goal of understanding market segmentation and consumer targeting more

effectively. As McHugh (2013) emphasises, such analysis is crucial when examining the behaviour of different groups.

When it comes to continuous or ordinal data such as price sensitivity expressed in percentage, we used the method of analysis of variance (ANOVA). According to Smalheiser, this method not only predicts the influence of individual demographic factors but also uncovers the interactive effects of combined variables (Smalheiser, 2017).

This approach allows for a more nuanced understanding of how multiple attributes simultaneously impact consumer attitudes. Data were encoded to facilitate ANOVA; for example, responses on a Likert scale assessing willingness to pay a premium were converted into a numerical scale from 1 to 5. This conversion was essential for computing means and conducting variance analysis across different demographic groups, allowing for the statistical assessment of differences in central tendencies.

- *Correlation Analysis*

The subsequent phase of analysis was designed to identify the broader influencing factors that may influence consumers' decision-making process. The primary objective of this phase was to elucidate the psychological and behavioural drivers behind consumers' willingness to try and potentially adopt cultivated meat in their diets. The factors selected for this analysis were carefully selected based on preliminary literature reviews and relevance to our research questions. The selection process was designed to encompass both consumer perceptions and actual consumption behaviour, to capture a comprehensive understanding of the various influences at play. The chosen factors include:

1. Awareness of Environmental Impact
2. Knowledge of Cultivated Meat
3. Concerns About Safety
4. Frequency of Meat Consumption
5. Dietary Preference
6. Perceived Healthiness

To investigate the relationships between these factors and the willingness to try cultivated meat, correlation analysis was employed. This statistical method was selected for its capacity to quantify the strength and direction of relationships between continuous and/or ordinal variables. Moreover, by identifying significant correlations, it was possible to

determine which factors are most strongly associated with an increased or decreased likelihood of trying cultivated meat.

This analytical approach provides critical insights that can guide strategic interventions and marketing strategies tailored to enhance consumer acceptance of cultivated meat. To realise this, we employed the Excel CORREL formula, which enabled us to undertake a straightforward analysis and interpretation. This approach made it possible to monitor the data in real time and to implement updates as new data became available.

- *Integration of Findings*

In order to elucidate the complex multivariate data gathered from our survey, we employed a range of visualization techniques that transformed abstract numbers into intuitive graphical representations. For instance, dashboards were used to dynamically display consumer trends across different demographics, allowing the manipulation of data views according to specific interests or inquiries. Additionally, when illustrating the analysis of the survey's responses, we presented the data that was sufficient in sample size to avoid misleading information. These visual tools are of great utility not only in presenting data but also in making it accessible and actionable for strategic decision-making.

3.4.2 Qualitative Data

The data obtained from the interview (see Interview Questions in Appendix 9.1) was subjected to a systematic analysis and organised according to the three predefined topics. The topics were selected based on their relevance to the research objectives, with the aim of exploring significant aspects of the company's strategic operations and market positioning.

1. Understand Business Model: This entailed a comprehensive analysis of potential struggles encountered.
2. Assess Future Perspectives: This entailed a discussion of anticipated market demands, technological advancements, and regulatory developments.
3. Confront Survey Data: This comparative analysis was of great importance to gain insight into the alignment (or discrepancies) between the perspectives of industry leaders and consumer expectations.

The objective of integrating these qualitative insights with quantitative survey results was to enhance our comprehension of the current landscape and to facilitate the development of actionable strategies for companies within the cultivated meat industry. The insights are anticipated to facilitate a nuanced comprehension of the necessary actions for innovating and adapting business models in response to evolving market conditions.

3.4.3 Secondary Data

Secondary data is crucial as inferences and conclusions drawn from the study are made by taking into consideration external data sources, allowing for a more nuanced and informed discussion.

In our case, the data extracted from the analysis of research papers were organised into tables using Excel, thus facilitating a clearer and more straightforward representation of their respective findings. Each paper was subjected to a meticulous examination, with pertinent data extracted for incorporation into our case study. Subsequently, the findings were combined with the results obtained from the data analysis of our survey, enabling the establishment of connections between the empirical evidence and existing literature. The mixed methods approach not only permitted the synthesis of insights but also facilitated the identification of novel observations, thereby enriching the overall analysis.

In the process of synthesising the various papers, each was meticulously categorised according to its title, authors, and year of publication. Subsequently, a concise summary was formulated for each paper, with a focus on encapsulating key factors relevant to our study in line with the results of the analysis of survey data. These factors were designed to encompass both consumer perceptions and actual consumption behaviours, thereby facilitating a thorough comprehension of the diverse variables influencing demand in the cultivated meat industry. Furthermore, the publications were distinguished according to their geographical focus and the extent to which consumers were reluctant to purchase cultivated meat products in those countries, to infer possible patterns. Additionally, the methodologies employed by each researcher were considered, including survey design, sample size, and the most significant findings.

Additionally, of particular significance was the analysis of the driving factors influencing consumers' future acceptance of cultivated meat, which had been organized in a table. This served as a pivotal reference point for aligning the literature findings with the analytical results, (explained in detail in the following paragraph).

3.4.4 Integration of Qualitative and Quantitative Data

In the mixed-methods framework employed, the qualitative insights obtained from the case study interview played a crucial role. These enabled us to integrate the findings from the quantitative survey and the secondary data study, thus allowing the identification of significant relationships among variables and the construction of coherent observations.

By integrating qualitative perspectives from the secondary data analysis, the survey questions were meticulously crafted to understand the consumer's attitudes and priorities prevalent within the food industry. Following the administration of the survey, the qualitative data obtained from the open-ended responses of the case study was analysed to complement and enrich the quantitative findings. This combined analysis not only provided a nuanced understanding of the data but also facilitated the interpretation of any unexpected trends or outliers observed in the statistical results.

The data analysis involved a thematic examination, following the approach outlined by Braun and Clarke (2012), applied to both the survey and interview datasets. This methodological choice was deliberate and in accordance with the deductive approach, whereby empirical data is compared and juxtaposed with theoretical concepts. Thus, quantitative, and qualitative data from both survey responses and interview transcripts were examined through the lens of predetermined subtopics derived from the theoretical constructs. The chosen determined elements were both cited in several studies and were relevant to our survey's results. Therefore, the integration of the qualitative and quantitative data considered these elements to be the main factors driving consumers' acceptance of cultured meat: awareness of the environmental impact of cultivated meat, frequency of meat consumption, dietary preference, and perceived healthiness.

Following the triangulation of data sources, through the synthesis of our primary survey data with secondary literature, we aimed to strengthen the conclusions derived from both quantitative and qualitative results so as to deliver recommendations based on what emerged from this research.

3.5 Validity and Reliability

According to Creswell (2014), we can state that validation refers to the accuracy of the study and findings with the research questions, whereas reliability relates to the consistency of

the research design and the arising outcomes; for that reason, this section provides evidence of this by also addressing the potential limitations.

The utilisation of a mixed methods approach was evident as a strategic means to tackle the limitations inherent to both the novelty of the industry and the reliance on a single case study. By integrating both qualitative and quantitative data, we could reliably capture insights from consumer preferences, needs and behaviours, while also validating and quantifying those insights on a larger scale.

For what concerns the survey, a pilot test was conducted prior to the distribution of the broader survey, allowing for a refinement of the questions and a thorough scrutiny of their clarity, comprehensibility, and effectiveness. This enhanced the overall response accuracy and reliability of the survey instrument.

Nonetheless, it must be acknowledged that this research proposal was subject to specific limitations. These included the constraints imposed by the specific sample size and demographic focus, which might affect the generalisability of the findings. Consequently, in order to improve the comprehensiveness of the findings, future research could benefit from larger and more diverse samples, encompassing a wider range of European countries.

The depth of short-term trend analysis and the assessment of regulatory changes might also be limited by the reliance on current models. Other limitations stem from the geographical focus, which was restricted to European countries – specifically Sweden, France, and Italy - and the limited timeframe of the study.

Furthermore, the challenge of managing an abundance of data, in the form of open-ended and close-ended answers from our survey, was mitigated by the inclusion of those factors that we deemed relevant as addressed by the majority of the respondents.

Regarding the quantitative part of the data analysis, an initial screening of the respondents' answers was made to avoid biases, and redundancy, and enhance credibility in the collection. This approach not only simplified the data analysis process but was also the most appropriate for the research context, allowing the identification of pertinent variables across diverse domains. Additionally, it must be acknowledged that the sampling strategy employed does not facilitate a random or stratified sample of the general population. Consequently, findings from this study should be interpreted with caution when attempting to generalise to a broader context. Indeed, to ensure validity in our data representation, we excluded data that lacked statistical significance. Notwithstanding this, the demographic data collected in the survey responses assisted in evaluating the diversity of the sample and helped in identifying any bias linked to specific consumer groups.

While acknowledging the potential drawbacks of a single case study, such as its susceptibility to being excessively specific to the company presented, we aimed to compensate for this limitation by capturing in greater depth practical insights about developing business models, which could inform other companies in this industry.

The integration of qualitative and quantitative data, as proposed by Creswell and Plano Clark (2018), ensured a more comprehensive understanding of customer's experiences and attitudes as well as a strengthened comprehension of the driving factors considered appropriate to influence an outcome (Creswell, 2014). Hence, the methodological approach employed in this study served as a solid means to effectively address the research questions by integrating empirical observations with analytical outcomes.

3.6 Ethical Considerations

In this study, ethical considerations are critical not only to comply with legal standards but also to ensure the integrity and reliability of our findings. Prior to the commencement of the study, informed consent was obtained from all participants of the survey. They were also adequately briefed about the objectives of the research, the use of data collected, and the rights to the anonymity of their responses, in accordance with the General Data Protection Regulation (GDPR).

Special attention was given to ethical data handling practices, where all participant information was anonymised and securely stored. Such measures served to prevent data breaches and ensure that our research would adhere to the highest standards of ethical rigour. Additionally, an informed signed consent was sent to the case company, to avoid any privacy concerns as highlighted by Bell, Bryman, and Harley, (2022).

4 Empirical Data

This section of the thesis presents the empirical data obtained from a comprehensive survey designed to assess consumer attitudes and behaviours towards cultivated meat. The purpose of this analysis was to identify demographic variations and correlations between different consumer traits, as well as to provide a graphical interpretation of the data in order to enhance the understanding of the potential future of the cultivated meat market.

Additionally, the case study is reported, followed by a summarised overview of the collected secondary data findings, which will be provided along with the arising observations.

Therefore, the objective of this chapter is to systemically represent the outcomes arising from the analysed primary and secondary data to illuminate the existing landscape of knowledge, facilitating a juxtaposition with our empirical findings, which will then be discussed.

4.1 Market Outlook

The survey, as stated in *3.3 Data Collection*, achieved a response rate of approximately 21.1%, with 205 respondents completing the survey out of 969 individuals (See Survey Questions in Appendix 9.1). This response rate permitted the performance of a statistically relevant analysis, drawing insights into consumer behaviours and preferences. The demographic composition of the respondents was diverse, encompassing age, income, gender, and country of residence (See Demographic Variables Analysis in Appendix 9.4).

This diversity enabled us to conduct a comprehensive analysis of different consumer segments. The respondents were, on average, 28 years of age and had an average annual income of €39,094.15. In the following sections, we present statistically significant findings, with a p-value threshold set at under 0.05.

4.1.1 Segment Analysis Results

i. Age

Age is a significant factor in influencing consumer behaviour towards cultivated meat. The analysis was conducted across specified age intervals: 18-25, 26-35, 36-45, 46-55, 56-65, and 65+. The aforementioned intervals were selected in order to encompass a comprehensive

range of life stages and to identify any potential variations in consumer behaviour between these groups. A total of six factors were identified where age-related differences were statistically significant. The results are presented in Table 5, which outlines the factors studied, the analytical method employed, the test statistics, the P-values, and the degrees of freedom for each age group comparison.

Table 5 - Age analysis results

Factor studied	**Analysis**	**Test statistic**	**P-value**	**Degree of Freedom**
Willingness to try before receiving information	*Anova*	4.049	0.0016	20
Willingness to try after receiving information	*Anova*	2.769	0.0192	10
Sensory Experience	χ^2	56.935	0.000021	20
Perception of Healthiness	χ^2	30.493	0.00071	10
Willingness to Pay	*Anova*	4.68	0.015	4
Time span for balancing alimentation with cultivated meat	χ^2	57.15	0.0000195	20

The analysis revealed significant age-related trends regarding the acceptance of cultivated meat. Younger participants, particularly those in the 18-25 and 26-35 age groups, demonstrated a notable willingness to try cultivated meat even before receiving additional information. This trend indicated an inherent openness among younger consumers towards innovative food technologies. Nevertheless, the relative importance placed on factors such as resemblance to traditional meat and perception of healthiness demonstrated considerable variability across different age groups. It is noteworthy that the younger demographic placed a high value on the sensory experience. This emphasis likely originated from their readiness to

try cultivated meat, which suggests a connection between their willingness to adopt new foods and their expectations for these foods to maintain familiar sensory qualities. Regarding healthiness perceptions of cultivated meat, younger consumers exhibited a more pronounced belief in the associated health benefits than older groups. This finding was consistent with the concerns about safety results highlighting a general trend among younger people, who often associate innovative food technologies with enhanced health benefits.

Contrary to our expectations, factors such as willingness to pay a premium for cultivated meat and the influence of social factors on decision-making did not show significant variations with age. This indicates that while younger individuals are more open to trying cultivated meat, their purchasing decisions may not necessarily be influenced by higher pricing or social endorsements, as initially hypothesised.

ii. Gender

In terms of gender, although many of the factors analysed were not statistically significant, indicating that gender does not significantly explain the willingness to try cultivated meat, other aspects did emerge as noteworthy. The results indicated that women expressed a greater concern for maintaining a traditional sensory experience, in terms of taste, texture, smell, and experience while cooking, compared to men. Moreover, women tended to express greater concern regarding the safety of cultivated meat than men did.

Table 6 - Gender analysis results

Factor studied	Analysis	Test statistic	P-value	Degree of Freedom
Sensory Experience	χ^2	24.203	0.00212	8
Perception of healthiness	χ^2	15.410	0.00392	5
Concerns about safety	χ^2	1.91	0.385	2

iii. Income

Three principal factors were found to be significantly influenced by income: the initial willingness to try cultivated meat before receiving information, the change in willingness after receiving information, and the impact of social influence. A statistically significant variation

in the initial willingness to try cultivated meat was observed across different income levels. This finding indicated that economic status might have influenced respondents' early perceptions and openness to new food technologies. It is surprising to note that factors such as willingness to pay and price sensitivity did not show statistically significant differences among the income brackets. This was useful to demonstrate that while income does influence perceptions and social influences related to cultivated meat, it does not necessarily correlate with the amount individuals are willing to pay.

Table 7- Income analysis results

Factor studied	**Analysis**	**Test statistic**	**P-value**	**Degree of Freedom**
Willingness to try before receiving information	χ^2	37.247	0.01093	20
Willingness to try after receiving information	χ^2	12.105	0.0334	5
Role of Social influence	χ^2	22.89	0.011	10

Figure 6 below presents a histogram graph for each income range with a sufficient sample size to avoid misleading interpretations. The bars in the graph represent the responses of each income bracket to the question, "Do social influences play a role in promoting alternative protein?". In general, respondents in the higher and lower income brackets exhibited a strong belief in the role of social influences.

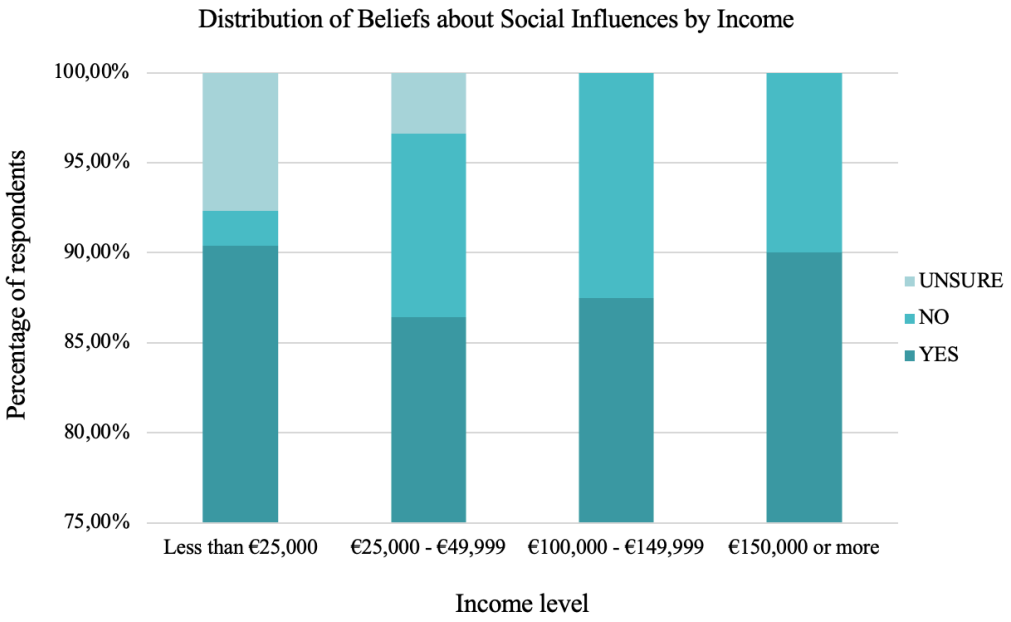

Figure 6 *- Distribution of beliefs about Social Influences by Income*

iv. Country of Residence

The analysis of how Country of Residence influenced attitudes toward cultivated meat has revealed significant variations across several key factors.

Table 8 - Country of Residence analysis results

Factor studied	Analysis	Test statistic	P-value	Degree of Freedom
Frequency of Meat Consumption	χ^2	66.89	0.015	44
Vision of the future food consumption	χ^2	65.68	0.00061	77
Time span for balancing alimentation with cultivated meat	χ^2	61.47	0.042	44
Concerns about safety	χ^2	28.88	0.00237	11

As anticipated, the frequency of meat consumption was found to be inherently linked to the country of residence of respondents. However, the factors concerning the future of cultivated meat were of particular interest since statistical significance was concurrently observed in these areas. The findings indicate that different countries have distinct expectations and preferences regarding the integration of traditional and alternative meat products into their diets. Furthermore, the data showed that respondents from different countries also varied in their timelines for adopting cultivated meat alongside traditional meat sources. In our case, the projected timeline has been identified for Italy, France, and Sweden: 12.64, 11.32, and 9.29 years, respectively.

4.1.2 Correlation analysis:

In order to identify the factors that significantly influence consumer willingness to try cultivated meat, a correlation analysis was performed. The results facilitated the identification of the strength and significance of relationships between willingness to try and various predictive variables. Table 9 provides a summary of these findings:

Table 9 - Willingness to Eat Correlations

Second variable	**ρ coefficient**	**P-value**	**Relationship status**
Awareness of Environmental impact	0.191	0.0063	Positive
Knowledge of Cultivated Meat	0.159	0.0234	Positive
Perceived Healthiness	0.526	6,62E-16	Strong Positive
Sensory Experience	0.236	0.00066	Moderately positive
Willingness to pay a premium	0.394	5,52E-09	Strong positive
Social Influence	0.225	0.0012	Moderate Positive

Two statistically significant positive correlations were identified in the analysis with ‘Willingness to try’, although they were relatively weak. Firstly, the awareness of the

environmental impact of the food industry denoted that while environmental awareness contributes positively to consumer willingness, it might not be the strongest determinant. A similar result was observed with regard to knowledge of cultivated meat, showing that being informed about the existence and benefits of cultivated meat might only slightly increase the likelihood of consumer trial.

In contrast, perceived healthiness exhibited a strong positive correlation with willingness to try cultivated meat. This strong association indicated that health perceptions played a pivotal role in consumer decision-making, with those who perceived cultivated meat as healthier being significantly more likely to try it. Furthermore, a moderate correlation was identified between sensory experience and willingness to try cultivated meat, highlighting the importance of sensory appeal in the acceptance of new food products.

An anticipated, strong correlation was found with 'Willingness to pay a premium', implying that consumers who were willing to invest more financially were also more inclined to experiment with cultivated meat. Finally, the influence of social networks, such as family and friends, was found to have a moderate positive correlation with willingness to try cultivated meat. This indicates that social contexts exert a considerable influence in shaping dietary choices.

Additionally, the analysis of other variables, including concerns about safety and frequency of meat consumption, was conducted. The results indicated a weak negative correlation between concerns about safety and willingness to try cultivated meat. Although not statistically significant ($p = 0.1359$), this suggested that safety concerns might act as deterrents for some consumers according to our analysis, but these are not universally prohibitive.

We also decided to run a correlation analysis between other variables, in order to find other plausible links and dynamics. Table 10 displays the correlation coefficients between pairs of variables, with statistically significant correlations ($p < 0.05$).

Table 10 – Relevant Variables Correlation

First Variable	**Second variable**	**ρ coefficient**	**P-value**	**Relationship status**
Knowledge of Cultivated Meat	Concerns about safety	-0.145	0.038	Negative
Awareness of Environmental impact	Perceived Healthiness	0.235	0.00073	Moderate Positive

The analysis demonstrated that individuals with a more comprehensive understanding of cultivated meat exhibited a diminished level of concern regarding its safety. This inverse correlation suggested that as knowledge about cultivated meat increases, safety concerns tend to decrease, although only to a limited extent. A moderate positive correlation was observed between awareness of the environmental impact and the perceived healthiness of cultivated meat. This correlation is of critical importance, as it underscored a unique dynamic where environmental consciousness not only fosters a more sustainable outlook but also enhances the perceived health benefits of alternative proteins. This is particularly significant in the context of cultivated meat, where both environmental and health impacts are pivotal to consumer acceptance. Linking this finding with Table 9, the dynamic showed that individuals who were aware of the environmental impacts of traditional meat production were more likely to regard cultivated meat as a healthier alternative.

Finally, it is important to note that correlation does not imply causation, and the observed relationships may be influenced by other unmeasured factors. In addition, the sample size and characteristics of the study population may limit the generalizability of the findings.

4.1.3 Graphical sum-up:

This section presents the findings of the study in the form of bar charts, which illustrate the factors that influence consumer willingness to try and trust in cultivated meat, as indicated by the survey respondents. In order to address the research questions posed, an analysis was conducted of the factors influencing consumer willingness to try cultivated meat among those who expressed interest in doing so. Of the 205 respondents, 142 expressed a willingness to try this type of meat. Figure 7 illustrates the reasons behind this willingness.

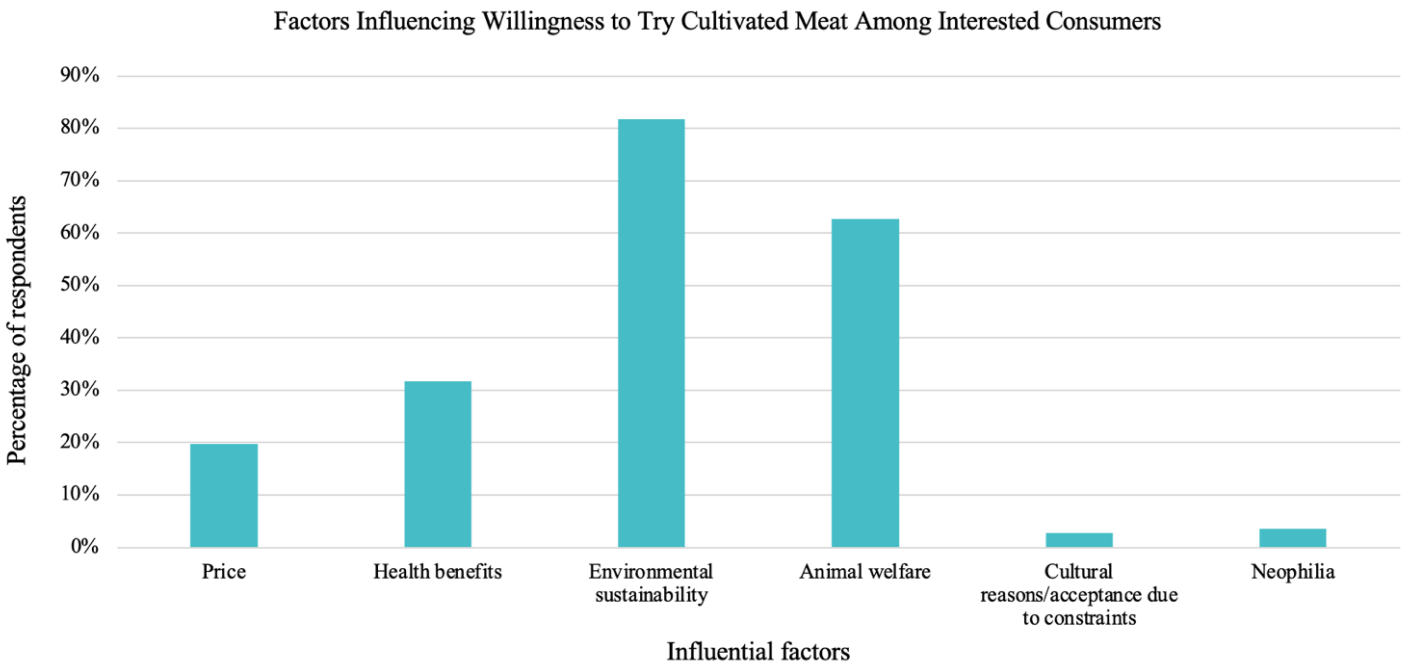

Figure 7 *– Factors Influencing Willingness to Try Cultivated Meat Among Interested Consumers*

The most significant factor, with over 80% of respondents citing it, was indicative of the growing consumer recognition of the environmental benefits associated with cultivated meat. This pronounced preference is due to/connected to a pervasive awareness and concern regarding the sustainability of food sources. Similarly, concern for animal welfare emerged as a significant driver, as nearly 60% of respondents highlighted it. This indicates that ethical considerations regarding animal treatment significantly influenced consumer choices. Approximately 30% of respondents indicated that health benefits were a motivating factor. This suggested that while health considerations were a significant factor for many consumers interested in cultivated meat, they did not represent the primary driver for the majority of these individuals. However, they did play a role in influencing certain consumer segments.

Surprisingly, price, often a critical factor in food purchase decisions, appeared to have a comparatively minor influence, with only about 20% of respondents considering it a pivotal factor. This suggested that, at least among those respondents who expressed an interest in cultivated meat, price sensitivity might be of secondary importance compared to other ethical and health considerations.

In addition to examining the factors that encourage interest in cultivated meat, we also sought to understand the reasons behind consumer reluctance. Figure 8 illustrates the factors influencing the reluctance to try cultivated meat among those who expressed disinterest in these

products. The analysis enabled the identification of the principal concerns that dissuaded these consumers, thereby it provided insights into potential market-related obstacles.

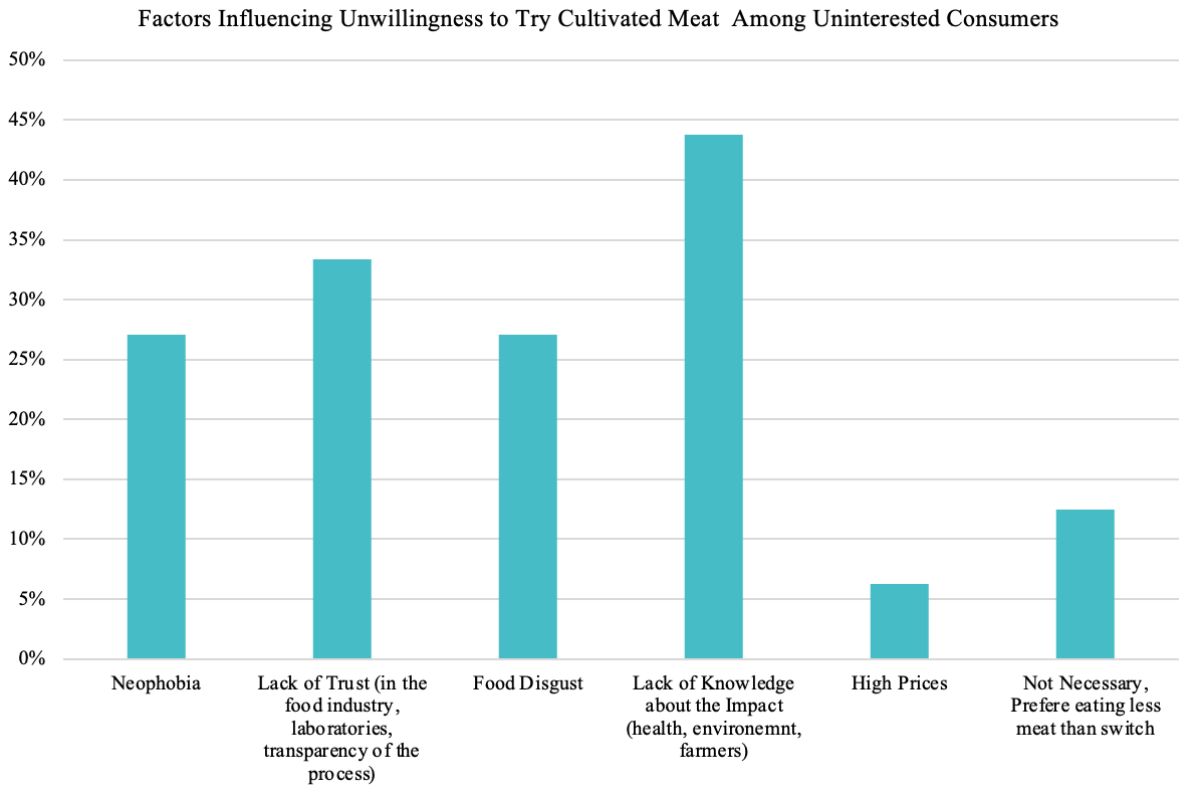

Figure 8 *– Factors Influencing Unwillingness to Try CM Among Uninterested Consumers*

Two principal concerns were identified as being of significant influence on consumer reluctance to try cultivated meat. Firstly, a lack of knowledge about the impact of cultivated meat on health, the environment, and farmers was evident, with many respondents highlighted significant informational gaps. Secondly, there was a notable degree of scepticism regarding the transparency of laboratory processes and production methods. These findings underscored the necessity for enhanced communication and awareness of the advantages of cultivated meat, to foster consumer trust. Furthermore, approximately 30% of participants exhibited neophobia, namely the fear of new foods, suggesting a substantial resistance to dietary changes among a segment of the population. Similarly, food disgust emerged as a barrier, which underscored the importance of perceived naturalness and appropriateness.

Continuing on a related topic, we also explored the factors that influenced consumer trust in alternative protein sources such as cultivated meat (see Figure 9).

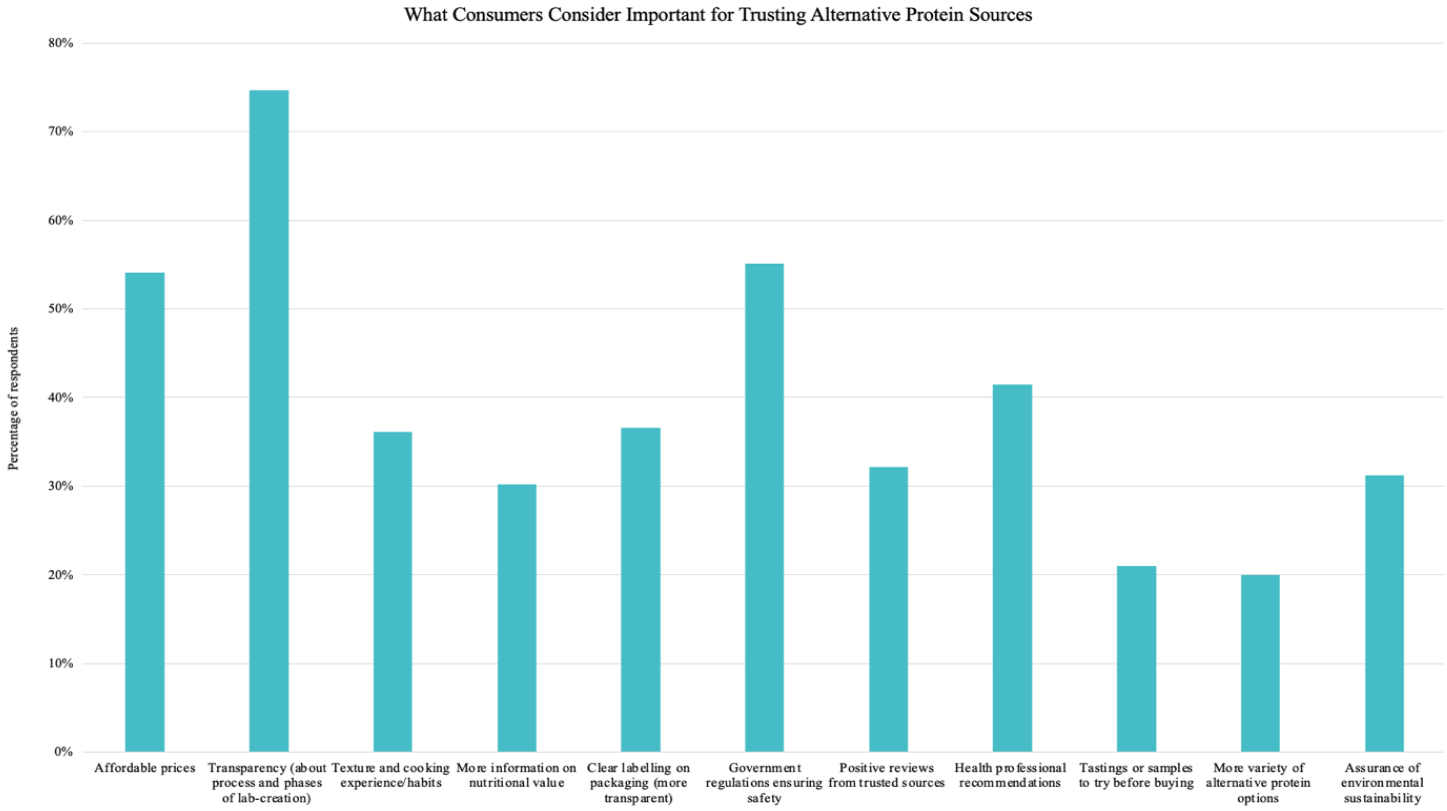

Figure 9 *- Factors Influencing Trust Towards Alternative Protein Sources*

The majority of respondents (approximately 70%) indicated that transparency about the production processes and ingredients is the most critical factor. This pronounced preference illustrated a more general consumer demand for openness and detailed information regarding the methods and components involved in the production of cultivated meats. Consequently, transparency emerged as a pivotal element in fostering consumer trust. Following this, over 60% of respondents highlighted the significance of government regulations in ensuring the safety of these products. This high concern for regulatory oversight indicated that consumers place significant trust in governmental bodies to verify the safety and quality of new food products, including cultivated meats. Furthermore, 54% of participants identified affordable pricing as a significant factor. This demonstrated that while ethical and safety concerns are paramount, economic considerations also played a crucial role in the acceptance and widespread adoption of alternative proteins.

The findings of this study identified two additional critical factors that consumers identified as essential for feeling secure when considering alternative proteins. Firstly, it was observed that consumers sought reassurance from trusted sources, with particular emphasis on endorsements by health professionals. Approximately 41% of respondents indicated that the recommendations of health professionals were of significant importance, highlighting the

strong and validating influence that medical endorsements have on the perception of the safety and healthfulness of alternative proteins. Concurrently, the survey revealed that 32% of respondents relied on positive reviews from trusted sources, demonstrating the efficacy of social proof in consumer decision-making. This reliance on credible testimonials and positive feedback reflected a broader trend whereby consumers seek affirmation from familiar and authoritative figures before embracing new food technologies.

Furthermore, respondents indicated that compatibility with existing texture preferences and cooking habits (36%) and clear labelling on packaging (36%) were important considerations. These findings suggested that consumers prioritize familiarity and straightforward information. These findings indicated that ensuring product integration into daily life without significant alterations to consumer habits is crucial for product acceptance. However, the unexpected lower emphasis on texture could suggest that sensory experience, traditionally a significant concern in food acceptance, may not be as critical for consumers exploring alternative proteins. This observation could indicate a shift in consumer priorities or a broader acceptance of varying textures in the context of innovative food solutions.

Other considerations, such as the assurance of environmental sustainability and the availability of more detailed nutritional information, reflected a growing consumer awareness and interest in the broader impacts of their dietary choices. These factors could be helpful for companies in order to align their product attributes with the consumers' values, particularly those related to health and environmental stewardship.

Finally, the interest in sampling products before purchase and the demand for a wider variety of options, as indicated by 21% and 20% of respondents, respectively, suggested that the provision of experiential and diverse choices could further enhance consumer trust and acceptance.

In light of the necessity for companies to establish digital relationships with their customers, our survey sought to identify the channels through which consumers prefer to receive dietary information (see Figure 10). It is therefore of the utmost importance for companies to gain an understanding of these preferences if they are to connect and effectively communicate with consumers.

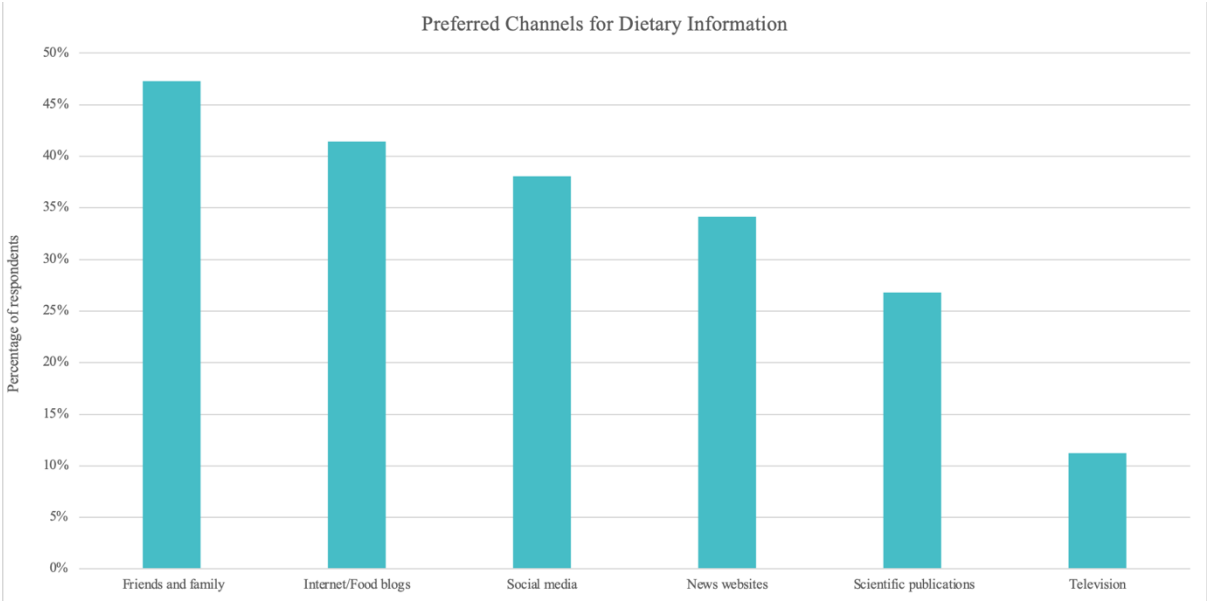

Figure 10 - *Preferred Channels for Dietary Information*

Individuals primarily relied on friends and family as their main source of information about food, with the internet and food blogs serving as secondary sources. Social media also played a significant role in influencing consumers' preferences, suggesting potential avenues for enhancing awareness and outreach efforts on cultivated meat.

4.2 Business Perspective

Jacob Schaldemose Peterson, CEO & co-founder of Re:Meat, was personally interviewed by us on the 8th of May 2024 for the purpose of this study. The interview began with a brief overview of the thesis and a clarification of the objectives of the interview. The primary aims were to gain insights into Mr. Peterson's perspectives on the market and Re:Meat's approach. The interview provided an understanding of the challenges and opportunities within the cultivated meat industry, highlighting the need for continued innovation, transparency, and strategic partnerships to drive adoption and market growth (See Interview Questions in Appendix 9.2).

In order to enhance clarity in the transposition of the interview and illustrate the alignment between qualitative insights from the CEO and the quantitative data from the survey, we organized the following information into three main topics, as delineated in the Data

Collection section. Thus, here we have summarized the key takeaways from our conversation with Mr. Peterson and aligned them with our empirical data.

4.2.1 Business Model Challenges:

- Revenue uncertainties prevailed as a main challenge for the company. In the biotech industry, these are uncertain due to the experimental nature of product development and the lack of production focus. This is also linked to the survey findings related to how income level affected willingness to pay, which varied significantly across demographic segments.
- The pursuit of producing an optimal product remains a challenge as more research and development to scale the technology is still ongoing. This is also inferred by the above-mentioned empirical results as environmental awareness; health benefits and sensory experiences are considered to be central to product development among different age groups.
- Other challenges for the company include securing fundraising, exacerbated by negative perceptions and limited investments in cultivated meat research. Political and personal interests also play a role in impacting funding and public perception.
- According to the CEO, the projected timeline for scaling remains uncertain, thereby introducing further complications. This is inherent to the complexity of the industry and due to external variables e.g., tech advancements, regulations and customer acceptance and diffusion of CM products.

4.2.2 Customer Segment Focus:

- Re:Meat operates as a B2B entity, targeting potential clients within the food industry, particularly existing meat producers, as these have a well-known brand and could be trusted more by consumers. By linking this to our gathered data, it can be stated that trust is a relevant variable for end consumers, therefore partnering with known brands could be beneficial for cultivated meat companies to establish their presence in the market.
- Partnerships with farmer-owned meat companies pose challenges, as cultivated meat would disrupt traditional farming practices. Farmers fear losing their status quo if they were to accept selling cultivated meat products. Whereas family-owned or finance-driven meat producers are more receptive to collaboration, according to Mr. Peterson.

- Re:Meat has a diverse set of customer profiles and as such this presents both challenges and opportunities for their future market engagement.

4.2.3 Future Expectations of the Cultivated Meat Industry:

- Cultivated meat's role is expected to be significant in the future of the food industry, driven by the growing global demand for meat. As also inferred by the CEO, awareness of the environmental and health implications of traditional meat consumption is increasing, enhancing interest in alternative proteins.

  The results of the questionnaire, which asked respondents to estimate the time required to achieve a balanced diet that could incorporate cultivated with traditional meat, revealed significant country-specific preferences and expectations regarding the integration of these two types of meat into diets.

  Global adoption of cultivated meat is still in its nascent stages. Concerning this matter, Mr. Jacob Peterson anticipated that consumer behaviour is expected to shift by 2030 or latest by 2040.

  As a matter of fact, by referring to our data, the projected timelines for the adoption of cultivated meat varied significantly, ranging from 5 to over 20 years. A substantial portion of respondents, specifically 36%, indicated they would expect this shift to occur within the next 10 to 20 years.

4.2.4 Data Confrontation and Insights:

- Transparency, health, and environmental concerns emerged to be critical focal points for the CEO of Re:Meat.
- Complete transparency, spanning from lab processes to end-consumer consumer education, is essential to lessen concerns about the production of cultivated meat. Therefore, Re:Meat's goal to build partnerships with grocery distributors would facilitate consumer education and trust-building.
- Regulation-wise compliance with EU Novel Food Regulation would be a step further in the cultivated meat landscape, Mr. Peterson highlighted that these are essential in educating about the health benefits of cultivated meat and in counteracting scepticism, while also fostering acceptance among individuals.
- Pricing remains a barrier for Re:Meat, which will necessitate a reduction to make cultivated meat competitive with traditional alternatives.

In conclusion, the CEO emphasised which are the main obstacles that are currently addressed and that have proven to be relevant to tackle, which are also aligned with our survey data results. These are transparency, knowledge of environmental impact, health concerns and price. To address these challenges, Re:Meat has developed three primary strategies.

Firstly, they have recently established a partnership with one of Scandinavia's largest grocery retailers with the intention of both conducting consumer studies and understanding better individuals' purchasing behaviour. Consequently, by providing consumers with information about cultivated meat, Re:Meat aims to disprove any misconceptions and increase awareness, thereby influencing consumer behaviour. This strategy illustrates the importance of knowledge dissemination in shaping perceptions and driving acceptance of cultivated meat.

Secondly, Re:Meat is focused on selling its products to established meat producers, capitalising on the trust and reliability associated with renowned brands in the industry. By forming partnerships with established entities, Re:Meat aims to overcome the trust barrier associated with new brands in the cultivated meat market. This approach emphasises the significance of brand reputation and credibility in influencing consumer perceptions based on the customer experience of purchase decisions.

Finally, pricing remains a crucial element in Re:Meat's strategy. They recognize the importance of achieving price parity with traditional meat products to enhance the competitiveness of cultivated meat in the market. The objective is to eliminate the price disparity, commonly referred to as the "greenium," and sell cultivated meat at a comparable price point to traditional meat. This pricing strategy demonstrates the significance of affordability in influencing consumer perceptions and market penetration.

In summary, Re:Meat's strategies revolve around knowledge dissemination, leveraging established brands for market entry, and addressing pricing disparities to drive acceptance and adoption of cultivated meat products. These strategies reflect the multi-faceted approach required to overcome the challenges and capitalize on the opportunities within the cultivated meat industry.

4.3 Secondary Data

The objective of this section is to summarize the key findings of the research papers and pertinent publications analysed. The intended purpose of this paragraph is to provide a

comprehensive overview of the factors significant in addressing the research questions delineated in our thesis. By cataloguing the insights obtained from each source, we aimed to furnish a solid foundation for a comparative analysis with the empirical data, which is reported in the following chapter.

Table 11 - Main findings from secondary data

Author and Year of publication	*Key Findings relevant for our study*
Boereboom et al. (2022)	• Potential **consumer segments**: those who currently consume meat but desire to reduce their consumption demonstrate the highest willingness to try cultivated meat (CM); • **Cultural determinants** exert significant influence on acceptance levels with differences among demographics; • **Lower-income countries consumers** exhibit lower levels of openness towards CM adoption; • **Food neophobia** and **new food technology neophobia** are prominent factors affecting acceptance levels, with higher levels associated to lower openness towards willingness to try cultured meat; • Greater awareness about the **environmental impact** of meat contribute to increased willingness to try CM.
Bryant, van Nek, and Rolland (2020)	• Individuals with a **background** in **farming** or close proximity to meat production demonstrate higher acceptance of CM; • **Risk-benefit perception**: perceived naturalness of CM influences consumer acceptance; • **Animal welfare:** arguments emphasising food safety and antibiotic resistance are more persuasive

	to consumers than those focusing solely on animal or environmental concerns; • **Food neophobia**: factor adversely affecting consumers' willingness to eat CM.
Carlsson, Kataria and Lampi (2022)	• Acceptance is associated with both **food neophobia** and alternative protein acceptance. **Unfamiliarity** with meat alternatives prevents people from adopting cultivated meat; • **Concerns** about the environment, human health, and animal welfare are positively correlated with people's readiness to pick meat alternatives; • Individuals **under 30 years old** are more likely to select meat alternatives than older age categories; • **Sensory experience** (i.e., taste) emerges as a critical factor when considering meat substitutes; • The **average person** that classified as unlikely switching to CM, even in the case of a zero-cost substitute, is an older than 30 years old and male individual.
Dupont and Fiebelkorn (2020)	• **Age**: children and adolescents show greater acceptance due to lower levels of food neophobia; • **Food neophobia** plays a pivotal role in shaping consumers' willingness to try; • **Ethical** and **environmental concerns**: consumers perceive CM as guilt-free option, while 3D-printed meat is perceived as less fresh and unnatural; • Consumers with **ethical concerns** view CM more positively; • **Perceived naturalness**: in terms of risk-benefit perception, cultured meat hamburgers are less favourably accepted compared to insect hamburgers.

Egolf, Hartmann and Siegrist (2019)	• High levels of **food neophobia** correlate with increased **disgust sensitivity** towards CM, contributing to consumer reluctance to try; • **Lack of knowledge**: offering detailed information about the process of CM would alleviate concerns.
Grasso et al. (2019)	• Consumer **price sensitivity**: a lower price increases motivation of price-conscious individuals to opt for CM; • Among **alternative protein substitutes** CM demonstrated **lowest** level of acceptance compared to plant-based, insect-based, dairy-based, single-cells or seafood protein options.
Hocquette et al. (2015)	• Females, particularly younger ones, exhibit higher **environmental concern animal welfare** and **inefficiencies** in meat production. Older females show lower acceptance of CM technologies; • **Human health** and **safety**, alongside with **animal welfare** and **environmental** considerations are primary concerns for respondents; • **Food neophobia** contributes to consumer apprehension about CM, similar to concerns about GMOs; • **Trust** in CM technology is crucial as individuals remain uncertain about its effectiveness in solving environmental issues; • **Health concerns** and **healthiness** of CM prevail among respondents.
Klöckner et al. (2022)	• **Environmental** and **ethical concerns** positively influence CM perception, while **sensory factors** (i.e., texture, taste) adversely affect consumer perception; • **Females** show higher propensity to try as exhibit higher awareness than males in **ethical benefits**,

	environmental friendliness, and absence of GMOs in cultured meat; • **High-income groups** diverge in the assessment of health-related concerns; • **Younger people** react more strongly than older individuals when confronted with matters as environmental and ethical considerations, price sensitivity, health perceptions and other practical aspects (with minor variations); • **Familiarity** with CM positively correlates with attitude; • Anticipation of support from significant others (e.g., relatives, friends) **positively influences** attitude towards cultivated meat.
Mancini and Antonioli (2019)	• **Food neophobia**: familiarity with food can positively influence consumer perception. • **Gender**: females unfamiliar with CM exhibit the most significant change in perception after receiving additional safety-related information; • **Age** influences willingness to try, as participants **under 25 years** old demonstrate a more positive perception than older ones; • **Awareness** or **prior exposure** to **information** about CM positively influences consumer perceptions; as well as awareness of **advances** in the technology positively influence acceptance; • **Willingness to pay** a premium for CM is positively associated with health and ethical motivations, especially when driving the intention to reduce meat consumption.
Onwezen et al. (2020)	• **Environmental concerns** are observed to be more relevant in the acceptance among animal-based proteins;

	• **Lack of familiarity** and **health awareness** of the potential benefits of alternative proteins is affecting consumers' attitude, as well underestimation of the ecological impact of traditional meat; • **Food neophobia**, disgust and related feelings affect acceptance: the acceptance of innovative alternative proteins is more dependent on **feelings** than the acceptance of other less innovative foods; • **Trust, social environment,** and **cultural appropriateness:** external factors that strongly influence acceptance.
Pakseresht, Kaliji and Canavari (2021)	• Eight major interconnected determinants of consumer acceptance: **ethical** and **environmental concerns**, **public awareness** and **knowledge**, **personal factors**, risk-benefit perceptions, product properties, presence of alternatives and availability; • Consumers are **willing to pay a premium** for meat alternatives, driven by ethical and environmental concerns, but not necessarily CM.
Post, M. J. (2012)	• **Safety concerns** and **scepticism** regarding the safety of CM are critical in addressing CM acceptance; • Important is to address consumer concerns about safety and need to invest in **extensive testing**; • Improving **regulatory oversight** is key to ensure public acceptance.
Rasmussen et al. (2024)	• **Gender** and **Age**: males and younger people are generally more accepting of and receptive to cultivated meat, as well as highly educated individuals;

	• **Awareness environment**: environmental concerns do not always predict a cluster's willingness to use cultured proteins, whereas climate impacts do raise concern. In consumers' perspective CM has to be produced in a sustainable manner; • **Resemblance** to traditional meat is important as CM is perceived as an unnatural and costly alternative to plant-based meat substitutes. It is crucial that CM's appearance, texture, taste, and smell are comparable to traditional meat.
Rolland, Markus, and Post (2020)	• **Lack of information:** uninformed interviewees compared to those familiar with CM technology demonstrate that awareness correlates with higher consumer perception and acceptance rate; • Product awareness and **familiarity** with the technology positively influence consumer perception.
Shaw and Mac Con Iomaire (2019)	• **Food neophobia** and **fear** of **unknown** long-term health effects are factors more frequently observed as causes for CM reluctance; • **Urban consumers** are more prone to consider CM a valid substitute to traditional meat.
Siegrist, Sütterlin and Hartmann (2018)	• **Perception** of **healthiness**: production process and inherent negative connotations of CM lead to resistance and concerns about its unnaturalness; • **Framing impacts**: consumer perception is affected by food neophobia and lack of knowledge.
Siegrist and Hartmann (2020)	• **Perceived naturalness** is negatively correlated with evoked disgust: participants with higher levels of food neophobia express greater disgust than those that have a lower lever; • Proposed predictors of CM acceptance encompass perceptions of **naturalness**, and consumer

	personality traits (e.g., **food neophobia**, **disgust sensitivity** and trust in the food industry); • **Close resemblance** to conventional meat should be prioritized in the CM process development to mitigate negative perceptions; • **Strengthening trust** is crucial to establish for successful market penetration of CM products.
Verbeke et al. (2015)	• Consumers prioritize **food safety**, taste, and other attributes when considering new food products; • **Concerns** among participants revolved around nutritional deficiencies, and unknown long-term **health effects** of CM consumption; • Lack of **consumer experience** with CM leads individuals to form their opinions based on third-party information and familiarity with existing food technologies (e.g., GMOs); • **Concerns** about scalability production problems, controllability, transparency of processes, regulations, **loss** of **agricultural** and cultural **practices** associated with traditional meat; • **Disgust** was expressed towards the process by which CM is created, not the meat itself.
Verbeke, Sans and Van Loo (2015)	• **Food safety** is a non-negotiable for consumers, emphasizing the importance of adequate information and assurance; • **Moral concerns** about unnaturalness and acceptability based on attributes as sensory quality, healthiness, safety, sustainability, price affect its acceptance; • Provision of **additional information** might increase acceptance;

	• **Price** and **sensory expectations** (i.e., similarity to conventional meat) are significant barriers to consumer willingness to try CM.
Vinnari and Tapio (2009)	• **Knowledge** about food technology advances is a main factor contributing to decreased conventional meat consumption.
Weinrich, Strack and Neugebauer (2020)	• **Ethics** (e.g., animal welfare, ecological safety) and **emotional concerns** (e.g., unnaturalness) were observed to be the strongest drivers affecting acceptance towards CM.

5 Results and Discussion

The objective of this chapter is to interpret the research questions proposed in our thesis by analysing the empirical evidence gathered and comparing it with the findings of previous secondary research. We have meticulously identified the most pertinent insights and present them here. Building on the abovementioned foundational preliminary framework (see Figure 5), we now present our approach to address the core research questions.

In alignment with the structure outlined in our preliminary framework, our initial endeavour focused on elucidating the drivers influencing consumer preferences. To accomplish this, we conducted a comprehensive analysis integrating primary survey data with secondary sources. Our discussion here begins by explaining the drivers of consumer acceptance. Consequently, by considering the barriers to consumer acceptance or reluctance, we delineate the crucial factors for overcoming these barriers and define target customer segments.

Furthermore, by juxtaposing the market dynamics with the business perspectives gleaned from the empirical chapter, which encompasses both the survey findings and the Re:Meat case study, we delineate the principal strategies that businesses operating within the cultivated meat (CM) landscape could adopt. This analytical endeavour concludes with the exploration of potential avenues for business model innovation.

5.1 Identification of Main Factors

The factors influencing customer acceptance of cultivated meat (CM), also referred to as barriers to adoption, are presented in this paper. The aforementioned barriers, as depicted in the preliminary framework, encompass a multitude of dimensions, ranging from cognitive to sensorial, social, and even physical ones. As demonstrated by Onwezen et al. (2020), the determinants of acceptance are diverse and can be classified into different categories. The preceding study identified three principal dimensions driving acceptance, which aligned with Siegrist study (2018); these being psychological, product-related, and external attributes-related (social environment, trust, and culture) dimensions. In the context of this thesis, the primary factors that have been identified as influential in shaping consumer preferences are:

1. Environmental Awareness
2. Previous Knowledge
3. Animal Welfare

4. Sensory Experience
5. Health (Concerns and Perceptiveness)
6. Safety Concerns
7. Neophobia
8. Price
9. Culture
10. Social Influence
11. Future Perception

5.1.1 Environmental Awareness

Environmental awareness emerged as a critical factor in influencing consumer acceptance of cultivated meat. Our primary data showed that increased environmental awareness was significantly correlated with increased willingness to try (see Figure 7 and Table 9). This finding is corroborated by other studies such as Bryant, van Nek & Rolland, (2020)who demonstrated a similar phenomenon. The consistency between the data sources highlights the importance of environmental concerns as a driver of cultivated meat uptake. Our gathered data suggest that consumers who prioritise environmental sustainability view cultivated meat as a viable solution to mitigate the negative environmental impacts of conventional meat production. This is consistent with the existing literature, which highlights the potential of cultured meat to reduce greenhouse gas emissions, land use and water consumption compared to conventional meat production (Tuomisto, Allan & Ellis, 2022).

5.1.2 Previous Knowledge

The results of the survey indicated that prior knowledge about food technology and advances in alternative proteins significantly influence cultivated meat's acceptance (see Table 9). This prior knowledge appears to have a direct negative impact on safety concerns (see Table 10). Similarly, during the interview, Mr. Peterson acknowledged witnessing the same phenomenon, noting that the results were statistically different when respondents were provided with information about cultivated meat versus when they were not. Therefore, it can be stated with confidence that respondents with more knowledge about cultured meat will demonstrate a higher willingness to try. This finding is consistent with the findings of Vinnari and Tapio (2009), who identified that awareness and understanding of food technology advances were crucial for decreasing conventional meat consumption and increasing

acceptance of alternative proteins, including cultivated meat. This finding underscores the importance of knowledge dissemination in fostering positive attitudes toward novel food technologies.

5.1.3 Animal welfare

The issue of animal welfare emerged as a significant motivator for the acceptance of cultivated meat, ranking second in importance among the factors influencing the respondents (see Figure 7). We argue that the concept of 'political consumerism', as explained by Rasmussen et al. (2024), plays a key role in this context. ‘Political consumerism’ refers to consumers making purchasing decisions based on ethical or political considerations, such as animal welfare and environmental sustainability. This trend can be seen in the growing market for products that promise higher animal welfare standards. Similarly, Weinrich, Strack and Neugebauer (2020) support this finding, indicating that ethical concerns, including animal welfare and environmental safety, are among the strongest drivers of cultivated meat acceptance. Our primary data suggest that the influence of animal welfare concerns is broader than previously documented, therefore extending to a broader consumer base.

5.1.4 Sensory Experience

The sensory experience, including taste, texture, and overall sensory attributes, emerged as a significant factor in the acceptance of cultivated meat (see Table 9). Although it was not one of the three most influential factors identified in our study, its importance cannot be dismissed, as respondents in both our primary and secondary data frequently cited it (see Figure 9). A considerable proportion of respondents, predominantly women, indicated that they would only accept cultivated meat if it closely resembled the sensory experience of conventional meat (see Table 6). This indicates that, while other factors may have emerged as more influential, sensory experience remains a key consideration for consumer acceptance. Indeed, Hartmann and Siegrist (2017) posit that sensory testing of a food product is crucial for its acceptance, as consumers are "unwilling to compromise on food safety and most likely not willing to compromise much on taste or other attributes" (Verbeke, Marcu, et al., 2015, p. 57). Similarly, Mancini and Antonioli (2019) found that taste and texture are central to consumers' evaluation of cultivated meat. Their research findings indicate that a significant proportion of consumers are reluctant to accept if it does not closely resemble the sensory qualities of conventional meat.

The alignment between our primary data and secondary sources serves to reinforce the critical role of sensory experience in consumer acceptance of cultivated meat. Nevertheless, our findings indicate that while sensory attributes are undoubtedly crucial, other factors such as environmental awareness and animal welfare may have a more immediate impact on consumer willingness to adopt cultivated meat. Once these factors have been addressed, it is likely that the importance of sensory attributes, price, and health concerns will become more self-evident, as secondary data frequently suggests.

5.1.5 Health Concerns and Perceived Healthiness

The findings of this study indicate that health concerns and perceptions of healthiness are significant factors influencing the acceptance of cultivated meat. The primary data indicated that concerns about the safety and nutritional value of cultivated meat were significant barriers to consumer acceptance (see Table 9). In addition, a lack of knowledge about the production process and potential long-term health effects significantly impacted people's willingness to try cultivated meat (see Figure 9). To address these concerns, respondents recommended increased transparency in production processes and the availability of comprehensive information on potential health impacts. Furthermore, the survey indicated that respondents were particularly concerned about unknown health risks, underscoring the need for clear communication about the safety and nutritional benefits of cultivated meat.

Our findings corroborate those of Verbeke et al. (2015) and Mancini and Antonioli (2019), who found that consumer reactions to cultivated meat were heavily influenced by concerns about nutritional deficiencies and potential long-term health effects. This underscores the necessity of providing clear, evidence-based information to consumers in order to mitigate these concerns. Furthermore, Van der Weele and Driessen (2013) emphasised that consumer acceptance of new food technologies is contingent upon trust in their safety and healthiness. This highlights the importance of transparent communication and rigorous safety assessments.

5.1.6 Safety Concerns

Safety concerns emerged prominently as a significant barrier to consumer acceptance of cultivated meat from our survey data. As shown in Table 9, the correlation between the willingness to eat with the perceived healthiness was strongly positive, implying that apprehensions among consumers regarding cultivated meat health safety are high. Moreover, primary data stemming from our survey demonstrated that respondents expressed fears about

the long-term health impacts and the production processes of cultivated meat as before mentioned (see Figure 8).

The existing literature also reiterates these concerns, emphasising the necessity of establishing transparent production practices and clear regulatory frameworks in order to instil consumer confidence. As stated by Verbeke et al., (2015), concerns specifically about nutritional deficiencies and long-term effects are primary barriers to cultivated meat acceptance. Moreover, Post (2012) also highlighted the scepticism about cultivated meat safety and the need for extensive testing and regulatory oversight to ensure public acceptance. This aligns with our findings, as respondents in our survey indicated that awareness of how production processes occur and obtaining scientific validation are essential to mitigate safety concerns.

5.1.7 Neophobia

Neophobia emerged as another critical factor acting as a barrier to cultivated meat acceptance. According to our secondary data, several research papers reported it as a prominent factor delineating acceptance levels. Particularly, Dupont and Fiebelkorn (2020) and Egolf, Hartmann and Siegrist (2019) stated that neophobia correlates with increased disgust sensitivity towards cultivated meat. Additionally, Klöckner et al. (2022) observed that familiarity is key when it comes to new foods as it positively correlates with attitude, and that it positively influences consumer perceptions. Mancini and Antonioli (2019) related to this by explaining that prior exposure to information about cultured meat as well as educational campaigns and tastings leads to neophobia reduction among consumers. The impact of neophobia is further elucidated in our correlation analysis, which revealed that respondents with greater knowledge exhibited a higher willingness to try it (see Table 9). Psychological factors contribute to this, such as feelings of distrust, uncertainty, and concerns over long-term consequences (Mancini & Antonioli, 2019 and Siegrist & Sütterlin, 2017). Both data sets concur on the impact of neophobia, yet the primary data set also highlights potential mitigation strategies e.g., educational campaigns, and tastings.

5.1.8 Price

Price emerged as a key determinant in the acceptance of cultivated meat, especially in the long term. As a matter of fact, our primary data indicated that cultured meat must be competitively priced in comparison to conventional meat for it to be deemed a viable option in

the future (see Figure 9). This observation aligns with findings from our secondary data, as highlighted by Boereboom et al. (2022) and Verbeke et al. (2015), which emphasised the indispensability of competitive pricing for cultivated meat acceptance. Furthermore, Grasso et al. (2019) drew attention on the significance of consumer price sensitivity, noting that lower prices incentivise price-conscious individuals to opt for cultured meat products.

Furthermore, Mancini and Antonioli (2019) demonstrated a positive correlation between the inclination to pay a premium for cultivated meat and health and ethical considerations. This assertion is corroborated by our findings, which indicate that the inclination to pay a premium does not act as a deterrent to prospective consumers; the initial high price of lab-grown meat does not impede willingness to try. Additionally, this factor remains minor when assessing the primary drivers influencing the willingness to try cultured meat. Nevertheless, while high prices may not initially deter consumers, they become a significant consideration when individuals become aware of the potential environmental benefits associated with cultured meat.

Both primary and secondary data converge on the critical importance of price. However, primary data suggest a heightened emphasis on achieving price parity with conventional meat, suggesting that existing cultured meat pricing strategies may fall short otherwise. This underscores the imperative of attaining economies of scale to drive down costs and enhance lab-grown meat's competitiveness in the market.

5.1.9 Culture

Cultural attitudes exert a significant influence on meat consumption and receptivity to food innovation, underlining the importance of comprehending and addressing cultural preferences in the context of cultivated meat acceptance. This is reinforced by the study of Bryant, van Nek and Rolland (2020), who emphasised the vital role of cultural determinants in shaping cultured meat acceptance. Although there is a strong resemblance between our primary data and existing literature, the latter also reveals a number of cultural concerns and preferences that are not fully captured in the analysis. As a matter of fact, the data indicates that cultural factors were less influential in determining willingness to try (see Figure 7). In alignment with this perspective, we elected not to integrate factors such as intercultural disparities and consumers' educational attainment, given their uncertain correlation with our research findings. Furthermore, our approach aligns with the insights of Siegrist and Hartman (2020b), who emphasised the variability of lab-grown meat acceptance levels across diverse cultural

landscapes. This variance necessitates caution in the generalisation of findings and emphasises the importance of ad hoc interpretation, tailored to specific cultural contexts. This observation emphasises the necessity for a more nuanced cultural analysis in order to develop effective marketing strategies that are tailored to diverse cultural contexts.

5.1.10 Social Influence

The influence of social factors, including peer opinions and societal norms, has a profound impact on consumer decision-making processes. This assertion is supported by numerous papers on consumer behaviour, which emphasise the important role of social dynamics. The study by Siegrist and Hartman (2020b) highlighted the importance of trust in facilitating the successful market penetration of cultivated meat products. In line with this, external factors such as trust, social environment, and cultural appropriateness have been identified as strong influencers of acceptance also by Onwezen et al (2020). Additionally, Klöckner et al. (2022) elucidated that the anticipation of support from significant others, including relatives and friends, positively influenced attitudes toward cultivated meat.

While both primary and secondary datasets confirm the importance of social influence, primary data emphasises the potential effectiveness of specific channels of influence. Indeed, our survey results on the preferred channels through which consumers seek dietary information (see Figure 10), show that individuals primarily rely on friends and family as their primary source of food-related information. Internet and food blogs followed them as secondary sources. Furthermore, social media has emerged as a significant influencer of consumer preferences, suggesting promising avenues for enhancing awareness and outreach efforts related to cultivated meat.

5.1.11 Future Perception

The future perception of cultivated meat is of critical importance to its acceptance, driven by increasing global demand for meat and growing awareness of the environmental and health impacts of traditional meat consumption. Both primary and secondary data indicate that forward-looking perceptions are significant in shaping consumer attitudes.

The study revealed that respondents' visions of future food consumption are determinant in the acceptance of cultivated meat. In particular, the concepts of sustainability and food security emerged as fundamental variables to take into consideration. It is therefore evident that clear and comprehensive communication strategies are essential to highlight these

long-term benefits. Rasmussen et al. (2024) and Boereboom et al. (2022) underscored the importance of emphasising sustainability and food security in order to positively influence consumer attitudes towards cultivated meat.

Furthermore, our primary data indicated that the anticipated timeframe for achieving dietary equilibrium between traditional and cultivated meat significantly impacts consumer acceptance. As illustrated in Table 8, respondents were requested to speculate on the time frame required to achieve dietary equilibrium between traditional and cultivated meat, with options including "5 to 10 years," "10 to 20 years," "20 years or more," and "Never." Despite initial reservations, 79% of respondents expressed optimism about integrating cultivated meat into their diets within the specified timeframes. This indicates that even among those initially hesitant, there is a growing awareness of cultivated meat products and their potential to become a common food component of future diets.

Moreover, ethical considerations, such as animal welfare and ecological safety, play a significant role in shaping future perceptions. In their 2020 study, Weinrich, Strack, and Neugebauer found that ethical considerations, including concerns about unnaturalness, significantly influence acceptance levels. Therefore, it is imperative that to build consumer trust these ethical concerns will be addressed in the future.

In conclusion, the future perception of cultivated meat is contingent upon its potential contributions to sustainability and food security, the anticipated timeframe for dietary integration, and ethical considerations. To facilitate consumer acceptance, it is essential to address these factors through effective communication strategies that emphasise the long-term benefits and address potential concerns clearly and comprehensively.

5.2 Targeted Customer Segments

It is of great importance to identify and comprehend the key demographic segments that are most likely to accept and adopt cultivated meat, as this will inform effective marketing strategies.

This section presents several consumer segments, based on empirical data, and supported by secondary literature. By targeting these specific groups, companies could enhance the acceptance and market penetration of cultivated meat, as also highlighted by previous research.

- *Age*

The initial demographic segment to target is younger generations, particularly those aged 18-35, as they exhibit a higher willingness to try cultivated meat and a positive perception of its health benefits (see Table 5). Studies by Bryant, van Nek and Rolland (2020) and Mancini and Antonioli (2019) indicated that individuals under the age of 25 have a more favourable perception of cultivated meat compared to older age groups. Therefore, this demographic is more likely to embrace new technologies and is driven by concerns about climate change and sustainability, making them more receptive to sustainable and ethical food innovations. Additionally, Rasmussen et al. (2024) provided further support for this assertion, indicating that younger individuals, particularly males and those with higher levels of education, tend to be more accepting of cultivated meat.

- *Gender*

Another key segment is represented by women, particularly younger females who demonstrated to be more health-conscious and environmentally aware. As reported in the secondary data section, research by Hartmann and Siegrist (2017) suggested that women critically evaluate the health and sensory aspects of new food products. This is in accordance with our empirical results, as evidenced in Table 6, wherein female respondents expressed greater concerns regarding concerns about safety, perception of healthiness and sensory experience of cultivated meat than male respondents did.

Additionally, Hocquette et al. (2015) found that younger females exhibit higher concern for animal welfare and environmental issues, which makes them more likely to accept cultivated meat. Indeed, women, particularly those with children, are frequently the primary decision-makers in household food purchases and are more likely to seek out healthier and more sustainable food options. However, to reiterate the findings of our data, it is also observed that older females exhibit a lower level of acceptance.

- *Income Levels*

The analysis of income has demonstrated that consumers with higher disposable incomes are more likely to support and invest in sustainable food innovations. Indeed, as Wilks and Phillips (2017) indicated, these consumers prioritize ethical and health considerations over cost, making them an important segment for marketing cultivated meat.

Nevertheless, our findings also indicate that lower-income individuals may represent a potential target market, potentially linked to the interest among young people. Furthermore, as

illustrated in Figure 6, both the lowest and highest income groups reported that social influences were significant in their decision-making process. Consequently, marketing strategies should be meticulously crafted to emphasise the ethical production of cultivated meat, appealing to both high- and low-income segments.

- *Urban Residents*

Despite the absence of primary data, specifically addressing residency types (urban, rural, etc.), we have chosen to incorporate urban residents as a target segment for cultivated meat consumption. This decision is based on the findings of Shaw and Mac Con Iomaire (2019), who suggest that urban consumers are often more exposed to emerging food technologies and innovations compared to their rural counterparts.

While our survey did not directly assess residency types, we deemed the inclusion of urban residents in our targetisation strategy to be relevant, given their propensity to adopt new products and technologies. The decision to include this segment was due to its alignment with other factors such as high-income levels and proximity to farmers, as identified through secondary data analysis. Following what Verbeke et al. (2015) stated, rural consumers may exhibit stronger attachments to traditional agricultural practices, which could result in lower acceptance of cultivated meat.

- *Special Attributes*

This subcategory is devoted to those consumers with specific traits and interests, including those who are environmentally conscious, ethical consumers, and health conscious. These groups have been identified as key targets based on the results of our primary data, which indicated that their decision-making is driven by concerns for sustainability, animal welfare, and the nutritional benefits of cultivated meat (see Figure 7).

Furthermore, Boereboom et al. (2022) observed that consumers who consume meat but wish to reduce their intake exhibit the highest willingness to try cultivated meat, motivated by health concerns, environmental sustainability, and ethical considerations. Consequently, individuals with these attributes represent a primary audience for cultivated meat products.

- *Geographical locations*

This factor is of great importance in influencing long-term strategic considerations, as it highlights the significant differences between countries in their future visions of food consumption. Although countries may currently exhibit no disparities in their willingness to

try cultivated meat, their divergent future perceptions of cultivated meat must be carefully weighed when targeting potential markets.

Our primary data further emphasised the significance of outlooks regarding future food consumption. As illustrated in Table 8, respondents exhibited different perceptions regarding the attainment of dietary equilibrium between traditional and cultivated meat. The findings reveal that even those who initially expressed reservations about incorporating cultivated meat into their future dietary habits have come to recognise the potential for doing so.

Furthermore, the data indicates that countries exhibit disparate timelines for the adoption of cultivated meat alongside traditional meat sources. These variations suggest that the feasibility and market readiness of cultivated meat varies across countries, while also highlighting the need for tailored approaches to market entry and expansion in the cultivated meat industry.

To conclude, this section addresses the primary research question: "*What are the key factors driving consumer acceptance of cultivated meat in Europe, and which consumer segments should companies specifically target based on these factors?*".

In essence, the analysis indicated that the primary factors influencing consumer acceptance of cultivated meat products include sustainability, health benefits, ethical considerations, and sensory attributes. In light of these findings, it can be concluded that companies should prioritise targeting younger consumers, specifically those between the ages of 18 and 35, with a particular focus on those under the age of 25. Additionally, individuals with higher disposable incomes and urban residents are key targets due to their openness to new food technologies and prioritisation of ethical considerations. Furthermore, consumers who are environmentally and health-conscious, like younger females as well as those with a forward-looking perspective on food consumption, are likely to adopt cultivated meat more readily.

5.3 Strategies to Overcome Consumer Resistance

The objective of this section is to elucidate the primary strategies available to businesses operating within the cultivated meat market. This endeavour is consistent with the preliminary framework established earlier, specifically to provide actionable insights that companies could leverage to navigate this disruptive landscape and innovate their business models. This analysis is based on a comprehensive examination of market dynamics, combined with the empirical

insights gleaned from the previous chapter. Its objective is to identify potential avenues for business operations.

The research question guiding this section is as follows: *"How can companies adapt their business models to capitalise on the unique challenges and opportunities in the cultivated meat market in Europe, and how can these adaptations inform broader theories of consumer preferences and strategic business decision-making in emerging markets?"*

5.3.1 Potential challenges and strategies for improvement

Considering the empirical data derived from the interview with Re:Meat CEO Mr. Jacob Peterson, several challenges and potential solutions for cultivated meat industry companies have been identified. Revenue uncertainties prevail due to the experimental nature of product development in the biotech industry, compounded by the need for significant investments still to be made to scale the technology. Furthermore, the timeframe for scaling remains uncertain, influenced by customer perception, regulatory constraints, and the necessity to maintain a low environmental impact even at scale. Complete transparency and consumer education are essential to mitigate concerns about cultivated meat production, while competitive pricing remains a barrier. Consequently, Re:Meat addresses these issues by entering into partnerships with retailers to gain an understanding of consumer behaviour and targeting receptive customer segments. Their objective is to increase awareness of the health and environmental impacts of traditional meat, thereby inducing people to understand the beneficial aspects of cultivated meat and to educate consumers about the safety of their production processes in a transparent manner.

As highlighted by Klöckner et al. (2022), there is a clear need to address the environmental impact of cultivated meat production, as well as to improve pricing, enhance the quality of the product, and ensure ethical production processes. These factors are crucial in developing a positive consumer attitude towards cultivated meat.

Moreover, research conducted by Pakseresht, Kaliji, and Canavari (2021) demonstrated the crucial role of awareness, perceived naturalness, and food-related risk perceptions. The ethical and environmental concerns of consumers would prompt them to consider meat substitutes. Studies indicated that consumer scepticism towards new food technologies often stems from a lack of awareness, suggesting that raising awareness and knowledge about the benefits of

cultivated meat is crucial for acceptance (Bhat & Bhat, 2011; Lusk, Roosen, & Bieberstein, 2014).

Hereinafter, we have delineated a range of strategies derived from both empirical data and literature, with the aim of providing a comprehensive framework for cultivated meat companies to enhance consumer acceptance and innovate their business models.

5.3.2 Strategies

i. Targeting Strategy

The initial phase of this study is concerned with the development of a targeted marketing strategy for cultivated meat products, which is informed by the analysis of consumer segments identified in the previous section. The primary target segment is young consumers, particularly those aged 18-35, who exhibit a higher willingness to try cultivated meat and have positive perceptions of its health benefits (See Table 5). This demographic is more likely to embrace new technologies and is driven by concerns about climate change and sustainability, making them more receptive to sustainable and ethical food innovations. Two targeting techniques are proposed: segmented marketing and concentrated marketing.

Segment marketing will involve creating tailored marketing strategies for different segments of the market. For cultivated meat, we identified: Health-conscious young adults, Environmentally aware youth, and Tech-savvy young professionals.

Concentrated marketing is a strategy that focuses on a single, well-defined segment of the market. With regard to cultivated meat, the following niche segment was identified: Early adopters and Innovators.

By concentrating marketing efforts on these niche segments, companies could cultivate a robust base of early adopters who can facilitate the broader acceptance and advocacy of cultivated meat.

ii. Social Factors and Marketing Strategies

The incorporation of social factors into marketing strategies is of paramount importance for overcoming consumer resistance and fostering acceptance of cultivated meat products. The results of our survey analysis indicated a moderate positive correlation between the influence of social networks, such as family and friends, and the willingness to try cultivated meat (see Table 9 of the Empirical Data chapter). This insight extends the existing theories by

highlighting the potential for leveraging social influence to promote acceptance of cultivated meat and establishing digital relationships with customers. The majority of respondents indicated a preference for receiving dietary information from friends and family, internet sources, food blogs, and social media platforms (see Figure 10). Consequently, to capitalise on these insights, companies could employ the aforementioned targeted marketing techniques (i.e., the above-mentioned niche segments) and implement them by leveraging social influencers to reshape perceptions about cultivated meat's resemblance to traditional meat.

Furthermore, it is important to develop marketing strategies that are tailored to consumers' dietary preferences, health consciousness, willingness to pay, and urban residency. Indeed, according to our empirical data (see Figure 7), it is evident that emphasising the environmental benefits of cultivated meat can, through urban-centric marketing strategies, reach urban residents who are more prone to emerging food technologies. These can be translated into public transportation advertisements, social media campaigns, and collaborations with urban-based establishments such as restaurants and food festivals.

To conclude, by aligning marketing efforts with social dynamics, and consumer preferences, while concurrently addressing neophobia, companies could effectively engage targeted audiences and drive acceptance of cultivated meat products.

iii. Pricing Strategy

Another crucial element of the marketing strategy is pricing. The results of our study indicated that consumers expect the price of cultivated meat to be affordable. As reported by Carlsson, Kataria and Lampi (2022), approximately one-third of consumers who purchase meat products would be willing to switch to a meat substitute if the price were two-thirds or less than the price of the meat option. Similarly, Mancini and Antonioli (2020) found that pricing significantly influences the willingness to try cultivated meat. To do so, it necessitates the establishment of a price point for cultivated meat products that is appealing to price-sensitive consumers and emphasises the additional benefits of health, environmental, and ethical considerations.

iv. Educating people

"*Education is the most powerful weapon which you can use to change the world*"
- Nelson Mandela

In addition to targeted marketing strategies, it is essential to educate consumers about the benefits and safety of cultivated meat to foster acceptance and trust in alternative protein sources. Our empirical findings, supported by insights from Rasmussen et al. (2024), demonstrated the significant role of transparency, government regulations, and compatibility with consumer preferences in shaping attitudes towards cultivated meat. Approximately 70% of respondents prioritize transparency about production processes and ingredients, reflecting a growing demand for openness and detailed information (see Figure 9 of Empirical Chapter). This suggests that to address these concerns, it would be beneficial to improve awareness aimed at enhancing understanding of the environmental impact and benefits of cultivated meat, as well as educating people starting from early childhood. For instance, integrating discussion of lab-grown meat production processes into biology classes can foster curiosity and awareness among young students. As Dupont and Fiebelkorn (2020) suggest, promoting a positive attitude towards alternative protein sources can increase the willingness to consume products like cultivated meat. This can be achieved through marketing campaigns, educational units in schools, and tasting sessions to engage students actively.

The CEO of Re:Meat also emphasised the importance of allowing people to visit the production facilities in order to show how meat is produced in laboratories. Such initiatives can significantly enhance educational efforts and build familiarity with cultivated meat. Therefore, efforts should be made to address consumer knowledge gaps through the provision of accessible and accurate information, as alongside with safety assurance measures, including transparent labelling, certifications, and stringent safety standards, which are essential to reduce those concerns.

Consequently, as reported in the case interview, investments in research and development are necessary to enhance the quality, taste, and nutritional value of cultivated meat, thereby improving consumer acceptance and adoption in the long term.

v. Partnerships strategy

The strategic approach to partnerships employed by cultivated meat companies, particularly in the business-to-business (B2B) model, presents a viable pathway for the construction of consumer trust and acceptance. Indeed, by partnering with established meat producers, companies can leverage the credibility and expertise of these entities to gain consumer confidence. This is corroborated by Siegrist and Hartmann (2020), who emphasised the significance of collaboration with reliable retail partners and producers. As inferred from

the empirical data, trust is a significant variable influencing consumer willingness to try cultivated meat; therefore, by collaborating with well-known and trusted brands, cultivated meat companies can leverage their reputations to introduce their products more effectively.

Moreover, as stated in section 2.6.4 of the Theoretical Framework paragraph, established meat companies should consider adopting the 'effectuation theory' approach, as proposed by Sarasvathy, Kotha and Hall (2001). This theory emphasises the utilisation of existing resources, partnerships, and business models to navigate uncertain and emerging markets. This approach allows firms to commence with the resources and capabilities they currently possess, collaborate with stakeholders to identify opportunities, and adapt their strategies in response to new information and changing market conditions. Therefore, it is particularly pertinent in the context of the emerging cultivated meat industry, where traditional forecasting and planning may prove to be ineffective due to the industry's early stage of development.

vi. Localization Strategy

Building on the framework proposed by Bartlett and Ghoshal (1988), a localisation strategy could be an effective approach for cultivated meat companies to address the convenience and cultural factors influencing consumer acceptance. Localisation enables companies to adapt their products to the specific preferences and cultural nuances of different markets, thereby enhancing consumer acceptance and satisfaction. This path involves a progression from an international strategy as our initial point to a multi-domestic approach, culminating in a transnational strategy.

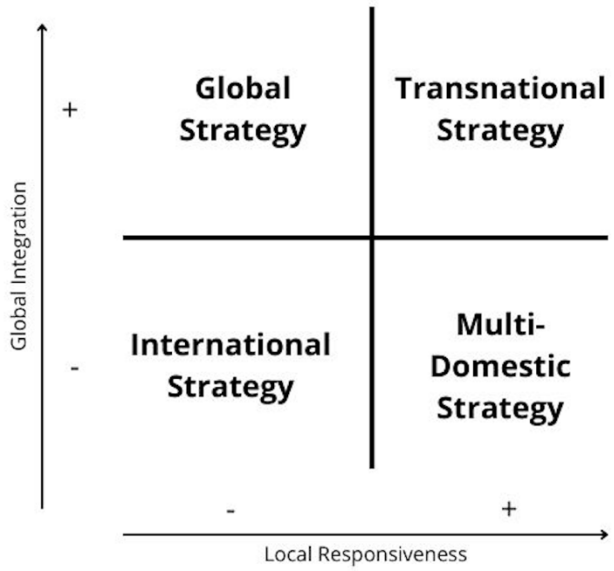

Figure 11 *- Bartlett and Ghoshal Framework 1988*

In the initial phase, cultivated meat companies should/would have to adopt an international strategy, typically focused on exporting standardised products from the home country to international markets. This approach permits companies to test the market and ascertain the basic consumer preferences without the necessity for significant investment in local adaptation. Although this strategy may not fully address local preferences, it provides valuable insights into market potential and initial consumer reactions.

However, as companies gain a better understanding of different markets, it should/would become increasingly evident that a multi-domestic strategy is essential for their continued success. This second phase of this approach prioritises responsiveness to local markets, thereby enabling companies to tailor their offerings to align with local preferences and tastes. For example, cultivated meat companies could offer meatballs in Sweden, pancetta in Italy, and foie gras in France. This strategy acknowledges the distinctive cultural and culinary practices of each market, thereby enhancing the probability of achieving consumer acceptance. Despite the associated costs and complexity, this method will foster a perception of responsiveness, thereby enhancing customer loyalty and trust.

In the long term, a transnational strategy could provide a more balanced approach between global efficiency and local responsiveness. Although the achievement of a transnational strategy is acknowledged to be complex, it is not unattainable, therefore, it seemed reasonable to consider it the third step in this phased approach. Indeed, numerous food companies have successfully implemented transnational strategies, thereby demonstrating the viability of this

approach within the food industry (Unilever, Nestle…). The benefits of a transnational strategy include economies of scale through standardisation, global learning through sharing innovations, and competitive advantage by balancing global efficiency with local relevance. Nevertheless, implementing this strategy is challenging, as it requires balancing global integration with local responsiveness and ensuring effective coordination across markets.

The proposed localisation strategy extends beyond the preliminary framework, which focuses primarily on consumer preferences, barriers to adoption, innovation dynamics, and business model innovation (BMI). Thus, in order to incorporate this localisation strategy, it is necessary to reconsider the response to the research question at hand. This should be done by introducing a new framework that integrates local responsiveness and global efficiency.

As illustrated in Figure 5, our preliminary framework delineated a trajectory from comprehending consumer preferences to implementing business model innovations, with feedback loops to incessantly refine and enhance the approach. However, the framework did not consider the variability of market contexts, which could influence consumer preferences and the adoption of new products.

In contrast, the refined framework integrates Bartlett and Ghoshal's (1988) phased approach, which allows companies to initially test markets with standardised products, subsequently adapt offerings to local demands, and eventually achieve a balance between global efficiency and local responsiveness. A significant enhancement in the revised framework is its concentration on local responsiveness. While the preliminary framework focused on innovation dynamics, it lacked the details required to facilitate the customisation of business models to suit the idiosyncrasies of local markets. The refined framework addresses this by emphasising the necessity of tailoring strategies to align with specific cultural and geographical contexts and to adapt their offerings to resonate with local preferences and practices. Another improvement is the incorporation of global efficiency, as the previous scheme primarily concentrated on consumer preferences and innovation without adequately considering the operational efficiency needed for scalable growth.

However, the refined framework is not free from constraints. One of the key issues is the resource intensity and its actual feasibility. Indeed, the necessity of localised strategies implies a substantial investment in market research, product development, and tailored marketing efforts, which could present a significant barrier fo*r small start-ups.* Nevertheless, the potential returns in terms of market penetration, consumer loyalty, and competitive advantage justify the

investment. The successful implementation of localized strategies could result in enhanced market positions and long-term sustainability.

In conclusion, the new framework will build on the preliminary one by incorporating a localization strategy, which emphasizes local responsiveness and global efficiency. This approach recognizes that addressing cognitive, physical, sensory, social, emotional, and cultural barriers to adoption requires tailored strategies that consider local market nuances.

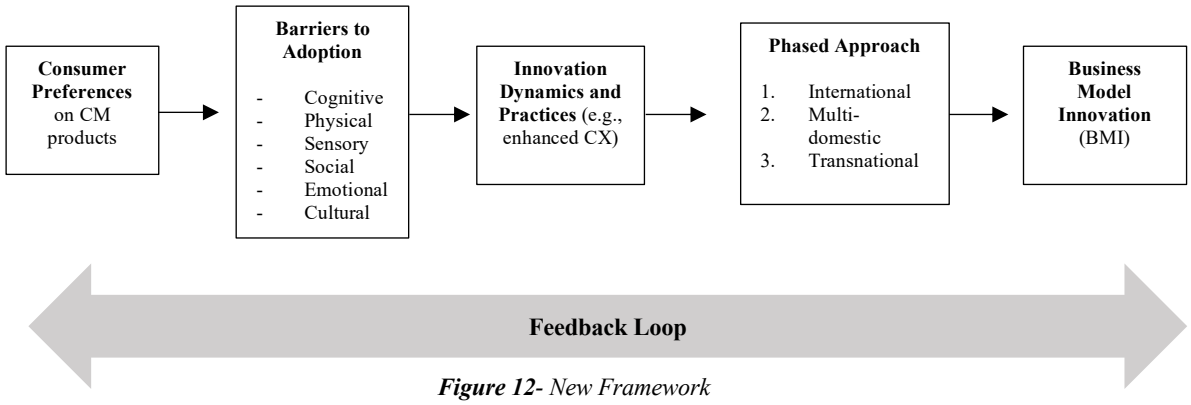

***Figure 12**- New Framework*

The implementation of this novel framework would enable cultivated meat companies to effectively navigate the complexities of different markets, thereby facilitating broader acceptance and adoption. The new framework emphasises the significance of a phased approach, commencing with an international strategy to test markets, subsequently progressing to a multi-domestic strategy for high local responsiveness, and finally achieving a transnational strategy that balances global and local needs.

6 Conclusion

The objective of this thesis was to examine the principal factors influencing consumer acceptance of cultivated meat in Europe and to identify the specific consumer segments that should be targeted based on these factors. A comprehensive literature review and empirical analysis have been conducted to address the main research questions and provide actionable insights for businesses operating in the cultivated meat market.

Our research has identified a number of critical factors that influence consumer acceptance of cultivated meat. These include environmental awareness, animal welfare, health concerns, sensory experience, and price expectations. Younger consumers, in particular those aged 18-35, were identified as a primary target segment due to their higher willingness to try cultivated meat and positive perceptions of its health benefits. Moreover, women, particularly younger females, and individuals with higher disposable incomes were identified as key segments. Furthermore, urban residents and those with specific attributes, such as being environmentally conscious or health-conscious, also show significant potential.

The findings of this study indicate that a localisation strategy, as proposed by Bartlett and Ghoshal (1998), could be an effective approach to address convenience and cultural factors, which would enhance consumer acceptance. This strategy involves a progression from an international approach to a multi-domestic and eventually a transnational strategy. This allows companies to adapt their offerings to local preferences and cultural nuances, thereby creating customer trust. Nevertheless, the implementation of a transnational strategy presents several challenges, including the need to balance global integration with local responsiveness and to ensure effective coordination across different markets. However, the food industry has demonstrated that the implementation of such a strategy is feasible, and the advantages include economies of scale, global learning, and competitive advantage.

Moreover, our study indicates that businesses should adopt a segmented marketing approach, targeting distinct groups such as health-conscious young adults, environmentally aware youth, and tech-savvy young professionals. It is recommended that concentrated marketing efforts be directed towards early adopters and innovators, to establish a robust base of advocates for cultivated meat. Furthermore, pricing strategies should ensure that products are affordable in order to enhance acceptance, as indicated by both our empirical data and secondary sources.

Although this research has considerable strengths, it is important to acknowledge its limitations. The study is primarily focused on European markets, and future research could examine consumer acceptance in other regions. Additionally, the survey did not evaluate differences between urban and rural consumers, nor did it specifically assess the influence of educational levels, both of which have been identified as significant factors influencing consumer acceptance. The sample size and diversity of the participants may not fully represent the entire European population, which could limit the generalisability of the findings. Furthermore, the use of self-reported data can introduce biases, and the study primarily captures short-term perceptions, which may differ from long-term acceptance and behaviour. Finally, the rapid advancements in cultivated meat technology and production processes were not fully accounted for, which could influence future consumer acceptance.

In conclusion, this thesis offers valuable insights into the factors driving consumer acceptance of cultivated meat and identifies key segments for targeted marketing strategies. By implementing the recommendations and strategies presented, businesses could more effectively navigate the cultivated meat market, foster consumer acceptance, and contribute to the sustainable growth of this innovative industry.

It is thus recommended that future research focus on business-oriented studies that explore innovative business models and strategic decision-making processes, given the dynamic nature of the cultivated meat industry. Furthermore, there is a necessity to develop and test new theoretical frameworks that could capture the intricacies of consumer behaviour in the context of novel foods. The integration of theories from behavioural economics, psychology, and cultural studies could provide deeper insights into the motivations and barriers to acceptance, thereby informing more effective marketing and communication strategies.

By addressing these areas, future research can provide more profound insights and more robust strategies to support the growth and acceptance of cultivated meat in diverse markets.

7 References

United Nations Environment Programme and International Livestock Research Institute, 2020. (2020). Preventing the next Pandemic: Zoonotic Diseases and How to Break the Chain of Transmission, *UN Environment Programme*, Available Online: https://www.unep.org/resources/report/preventing-future-zoonotic-disease-outbreaks-protecting-environment-animals-and [Accessed 20 April 2024]

Amit, R. & Zott, C. (2012). Creating Value through Business Model Innovation, MIT Sloan Management Review, Available Online: https://faculty.wharton.upenn.edu/wp-content/uploads/2012/03/Creating-Value-through-Business-Model-Innovation.pdf [Accessed 8 April 2024]

Andrade, C. (2021). The Inconvenient Truth about Convenience and Purposive Samples, *Indian Journal of Psychological Medicine*, [e-journal] vol. 43, no. 1, pp.86–88, Available Through: Sagepub https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8295573/

Bartlett, C. A. & Ghoshal, S. (1989). Managing across Borders: The Transnational Solution, *The Academy of Management Review*, [e-journal] vol. 16, no. 1, p.225, Available Online: https://www.researchgate.net/publication/200465438_Managing_Across_Borders_The_Transnational_Solution [Accessed 16 May 2024]

Bell, E., Bryman, A. & Harley, B. (2022). Business Research Methods, 6th edn, Oxford: Oxford University Press

Bernard, H. R. (2018). Research Methods in Anthropology: Qualitative and Quantitative Approaches, Sixth Edition, *Rowman.com*, [e-book] Sixth edition. Lanham, Maryland: Rowman & Littlefield., Available Online: https://rowman.com/ISBN/9781442268883/Research-Methods-in-Anthropology-Qualitative-and-Quantitative-Approaches-Sixth-Edition

Birnbaum, R., Christensen, C. M. & Raynor, M. E. (2005). The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail, *Academe*, [e-journal] vol. 91, no. 1,

Available Online: http://web.mit.edu/zolot/Public/Innovator's%20Dilemma%20excerpt.pdf [Accessed 31 March 2024]

Boateng, E. F., Nasiru, M. M. & Agyemang, M. (2020). Meat: Valuable Animal-Derived Nutritional Food. A Review, *Asian Food Science Journal*, pp.9–19

Boereboom, A., Mongondry, P., de Aguiar, L. K., Urbano, B., Jiang, Z. (Virgil), de Koning, W. & Vriesekoop, F. (2022). Identifying Consumer Groups and Their Characteristics Based on Their Willingness to Engage with Cultured Meat: A Comparison of Four European Countries, *Foods*, vol. 11, no. 2, p.197.

Boukid, F., Hassoun, A., Zouari, A., Tülbek, M. Ç., Mefleh, M., Aït-Kaddour, A. & Castellari, M. (2023). Fermentation for Designing Innovative Plant-Based Meat and Dairy Alternatives, *Foods*, vol. 12, no. 5, p.1005.

Braun, V. & Clarke, V. (2012). Thematic Analysis, *APA Handbook of Research Methods in psychology, Vol 2: Research designs: Quantitative, qualitative, neuropsychological, and biological.*, vol. 2, no. 2, pp.57–71

Bryant, C. & Dillard, C. (2019). The Impact of Framing on Acceptance of Cultured Meat, *Frontiers in Nutrition*, vol. 6

Bryant, C., van Nek, L. & Rolland, N. C. M. (2020). European Markets for Cultured Meat: A Comparison of Germany and France, *Foods*, [e-journal] vol. 9, no. 9, p.1152, Available Online: https://www.mdpi.com/2304-8158/9/9/1152

Carlsson, F., Kataria, M. & Lampi, E. (2022). How Much Does It Take? Willingness to Switch to Meat Substitutes, *Ecological Economics*, vol. 193, p.107329.

Chesbrough, H. (2019). Business Model Innovation: Opportunities and Barriers, *Long Range Planning*, vol. 43, no. 2-3, pp.354–363

Chesbrough, H. & Rosenbloom, R. (2002). The Role of the Business Model in Capturing Value from Innovation: Evidence from Xerox Corporation's Technology Spin-off Companies, *Industrial and Corporate Change*, vol. 11, no. 3, pp.529–555

Creswell, J. (2009). Research Design : Qualitative, Quantitative and Mixed Methods Approaches., 3rd edn, Sage Publications, Inc

Creswell, J. W. (2014). Research Design: Qualitative, Quantitative, and Mixed Methods Approaches, 4th edn, London: Sage Publications Ltd

Creswell, J. W. & Plano Clark, V. L. (2018). Designing and Conducting Mixed Methods Research, 3rd edn, Los Angeles: Sage

Crownhart, C. (2023). Here's What We Know about Lab-Grown Meat and Climate Change, *MIT Technology Review*, Available Online: https://www.technologyreview.com/2023/07/03/1075809/lab-grown-meat-climate-change/

Dupont, J. & Fiebelkorn, F. (2020). Attitudes and Acceptance of Young People toward the Consumption of Insects and Cultured Meat in Germany, *Food Quality and Preference*, vol. 85, p.103983

Egolf, A., Hartmann, C. & Siegrist, M. (2019). When Evolution Works against the Future: Disgust's Contributions to the Acceptance of New Food Technologies, *Risk Analysis*, vol. 39, no. 7, pp.1546–1559

Folke, C., Carpenter, S. R., Walker, B., Scheffer, M., Chapin, T. & Rockström, J. (2010). Resilience Thinking: Integrating Resilience, Adaptability and Transformability, *Ecology and Society*, [e-journal] vol. 15, no. 4, Available Online: https://www.fs.fed.us/pnw/pubs/journals/pnw_2010_folke.pdf [Accessed 22 April 2024]

Fraser, D., Weary, D. M., Pajor, E. A. & Milligan, B. N. (1997). A Scientific Conception of Animal Welfare That Reflects Ethical Concerns, *Animal Welfare*, vol. 6, no. 3, pp.187–205.

Godfray, H. C. J., Aveyard, P., Garnett, T., Hall, J. W., Key, T. J., Lorimer, J., Pierrehumbert, R. T., Scarborough, P., Springmann, M. & Jebb, S. A. (2018). Meat Consumption, Health, and the Environment, *Science*, [e-journal] vol. 361, no. 6399, Available Online: https://www.science.org/doi/10.1126/science.aam5324 [Accessed 26 March 2024]

Good Food Institute. (2023a). Environmental Benefits of Alt Proteins - the Good Food Institute, *Gfi.org*, Available Online: https://gfi.org/initiatives/climate/environmental-benefits-of-alt-proteins/?_gl=1 [Accessed 20 April 2024]

Good Food Institute. (2023b). Addressing Challenges of Cultivated Meat - the Good Food Institute, *Gfi.org*, Available Online: https://gfi.org/cultivated/addressing-cultivated-meat-challenges/ [Accessed 19 April 2024]

Good Food Institute. (2024). Cultivated Meat LCA/TEA Report Analysis - the Good Food Institute, *Gfi.org*, Available Online: https://gfi.org/resource/cultivated-meat-lca-tea-report-analysis/?_gl=1 [Accessed 26 March 2024]

Grasso, A. C., Hung, Y., Olthof, M. R., Verbeke, W. & Brouwer, I. A. (2019). Older Consumers' Readiness to Accept Alternative, More Sustainable Protein Sources in the European Union, *Nutrients*, vol. 11, no. 8, p.1904.

Hamel, G. & Liisa Välikangas. (2003). The Quest for Resilience, *ResearchGate*, Available Online: https://www.researchgate.net/publication/10576312_The_Quest_for_Resilience [Accessed 22 April 2024]

Hocquette, A., Lambert, C., Sinquin, C., Peterolff, L., Wagner, Z., Bonny, S. P. F., Lebert, A. & Hocquette, J.-F. (2015). Educated Consumers Don't Believe Artificial Meat Is the Solution to the Problems with the Meat Industry, *Journal of Integrative Agriculture*, [e-journal] vol. 14, no. 2, pp.273–284, Available Online: https://www.sciencedirect.com/science/article/abs/pii/S2095311914608868

Hocquette, J.-F. (2016). Is in Vitro Meat the Solution for the Future?, *Meat Science*, vol. 120, pp.167–176

Hopkins, P. D. (2015). Cultured Meat in Western Media: The Disproportionate Coverage of Vegetarian Reactions, Demographic Realities, and Implications for Cultured Meat Marketing, *Journal of Integrative Agriculture*, vol. 14, no. 2, pp.264–272

Johnson, M. W., Christensen, C. M. & Kagermann, H. (2008). Reinventing Your Business Model, *Harvard Business Review*, Available Online: https://hbr.org/2008/12/reinventing-your-business-model [Accessed 12 March 2024]

Karami, M., Baber, W. W. & Ojala, A. (2022). The Effectual Process of Business Model Innovation for Seizing Opportunities in Frontier Markets, *Technovation*, vol. 117, p.102595

Karmaus, A. L. & Jones, W. (2020). Future Foods Symposium on Alternative Proteins: Workshop Proceedings, *Trends in Food Science & Technology*

Keiningham, T., Aksoy, L., Bruce, H. L., Cadet, F., Clennell, N., Hodgkinson, I. R. & Kearney, T. (2021). Customer Experience Driven Business Model Innovation, *Journal of Business Research*, vol. 116, pp.431–440

Klöckner, C. A., Engel, L., Moritz, J., Rob J.F. Burton, Young, J. F., Ulla Kidmose & Ryynänen, T. (2022). Milk, Meat, and Fish from the Petri Dish—Which Attributes Would Make Cultured Proteins (Un)Attractive and for Whom? Results from a Nordic Survey, vol. 6

Laestadius, L. I. & Caldwell, M. A. (2015). Is the Future of Meat Palatable? Perceptions of in Vitro Meat as Evidenced by Online News Comments, *Public Health Nutrition*, vol. 18, no. 13, pp.2457–2467

Lanzoni, D., R. Rebucci, G. Formici, Cheli, F., Ragone, G., Baldi, A., L. Violini, Sundaram, T. S. & C. Giromini. (2024). Cultured Meat in the European Union: Legislative Context and Food Safety Issues, *Current Research in Food Science*, pp.100722–100722

Lynch, J. & Pierrehumbert, R. (2019). Climate Impacts of Cultured Meat and Beef Cattle, *Frontiers in Sustainable Food Systems*, vol. 3, no. 5

Mancini, M. C. & Antonioli, F. (2019). Exploring Consumers' Attitude towards Cultured Meat in Italy, *Meat Science*, vol. 150, pp.101–110

Mancini, M. C. & Antonioli, F. (2020). To What Extent Are Consumers' Perception and Acceptance of Alternative Meat Production Systems Affected by Information? The Case of Cultured Meat, *Animals*, vol. 10, no. 4, p.656

Martinovski, S. (2016). NUTRITION BUSINESS MODELS of CONSUMER BEHAVIOUR WHEN PURCHASING SELF-EXPLANATORY FOOD PRODUCTS, Available

Online: https://www.researchgate.net/publication/313401766_Nutrition_business_models_of_consumer_behaviour_when_purchasing_self-explanatory_food_products [Accessed 10 April 2024]

McHugh, M. L. (2013). The Chi-Square Test of Independence, *Biochemia Medica*, [e-journal] vol. 23, no. 2, pp.143–149, Available Online: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3900058/

Newburger, E. (2019). As the Lab-Grown Meat Industry Grows, Scientists Debate If It Could Exacerbate Climate Change, *CNBC*, Available Online: https://www.cnbc.com/2019/10/19/lab-grown-meat-could-exacerbate-climate-change-scientists-say.html [Accessed 12 April 2024]

Nidumolu, R., Prahalad, C. K. & Rangaswami, M. R. (2009). Why Sustainability Is Now the Key Driver of Innovation, *Harvard Business Review*, Available Online: https://hbr.org/2009/09/why-sustainability-is-now-the-key-driver-of-innovation

Nosratabadi, S., Mosavi, A. & Lakner, Z. (2020). Food Supply Chain and Business Model Innovation, *Foods*, [e-journal] vol. 9, no. 2, p.132, Available Through: MDPI https://www.mdpi.com/2304-8158/9/2/132 [Accessed 23 March 2024]

Onwezen, M. C., Bouwman, E. P., Reinders, M. J. & Dagevos, H. (2020). A Systematic Review on Consumer Acceptance of Alternative Proteins: Pulses, Algae, Insects, Plant-Based Meat Alternatives, and Cultured Meat, *Appetite*, vol. 159, p.105058

Osterwalder, A., Pigneur, Y. & Tucci, C. L. (2005). Clarifying Business Models: Origins, Present, and Future of the Concept, *Communications of the Association for Information Systems*, [e-journal] vol. 16, no. 1, p.3, Available Online: https://aisel.aisnet.org/cais/vol16/iss1/1/ [Accessed 27 March 2024]

Pakseresht, A., Kaliji, S. A. & Canavari, M. (2021). Review of Factors Affecting Consumer Acceptance of Cultured Meat, *Appetite*, vol. 170, no. 170, p.105829

Post, M. J. (2012). Cultured Meat from Stem Cells: Challenges and Prospects, *Meat Science*, vol. 92, no. 3, pp.297–301

Rasmussen, M. K., Gold, J., Kaiser, M. W., Moritz, J., Räty, N., Rønning, S. B., Ryynänen, T., Skrivergaard, S., Ström, A., Therkildsen, M., Tuomisto, H. L. & Young, J. F. (2024). Critical Review of Cultivated Meat from a Nordic Perspective, *Trends in Food Science & Technology*, [e-journal] vol. 144, p.104336, Available Online: https://www.sciencedirect.com/science/article/pii/S0924224424000128 [Accessed 28 March 2024]

Re:Meat. (2024). Re:meat on LinkedIn: #Foodtech #Cleantech #Cultivatedmeat #Greentech #Cleantech #Climatetech… | 34 Comments, *Www.linkedin.com*, Available Online: https://www.linkedin.com/feed/update/urn:li:activity:7186634696972189696/ [Accessed 21 April 2024]

Reynolds, M. (2024). States Are Lining up to Outlaw Lab-Grown Meat, *Wired*, Available Online: https://www.wired.com/story/cultivated-meat-florida-ban/

Rindova, V. & Courtney, H. (2020). To Shape or Adapt: Knowledge Problems, Epistemologies, and Strategic Postures under Knightian Uncertainty, *Academy of Management Review*, vol. 45, no. 4, pp.787–807

Rolland, N. C. M., Markus, C. R. & Post, M. J. (2020). Correction: The Effect of Information Content on Acceptance of Cultured Meat in a Tasting Context, *PLOS ONE*, vol. 15, no. 10, p.e0240630

Sarasvathy, S. D. & Dew, N. (2005). New Market Creation through Transformation, *Journal of Evolutionary Economics*, vol. 15, no. 5, pp.533–565

Sarasvathy, S., Kotha, S. & Hall, M. (2001). EFFECTUATION in the MANAGEMENT of KNIGHTIAN UNCERTAINTY: EVIDENCE from the REALNETWORKS CASE, pp.1–49.

Saunders, M., Lewis, P. & Thornhill, A. (2023). Research Methods for Business Students, 9th edn, United Kingdom : Pearson

Schaldemose Peterson, J. (2024). Re:Meat Case Study Interview

Schatz, E. (2003). Comparing, Contextualizing, and Conceptualizing, *Demographic Research*, vol. Special 1, pp.143–174

Schmidinger, K., Bogueva, D. & Marinova, D. (2021). New Meat without Livestock, *Https://Services.igi-Global.com/Resolvedoi/Resolve.aspx?Doi=10.4018/978-1-7998-5354-1.Ch056*, Available Online: https://www.igi-global.com/gateway/chapter/268189 [Accessed 20 April 2024]

Shaw, E. & Mac Con Iomaire, M. (2019). A Comparative Analysis of the Attitudes of Rural and Urban Consumers towards Cultured Meat, *British Food Journal*, vol. 121, no. 8

Siegrist, M. & Hartmann, C. (2020). Perceived Naturalness, Disgust, Trust and Food Neophobia as Predictors of Cultured Meat Acceptance in Ten Countries, *Appetite*, vol. 155, p.104814

Siegrist, M., Sütterlin, B. & Hartmann, C. (2018). Perceived Naturalness and Evoked Disgust Influence Acceptance of Cultured Meat, *Meat Science*, vol. 139, pp.213–219

Smalheiser, N. R. (2017). ANOVA, *Data Literacy*, pp.149–155

Stephens, N., Di Silvio, L., Dunsford, I., Ellis, M., Glencross, A. & Sexton, A. (2018). Bringing Cultured Meat to Market: Technical, Socio-Political, and Regulatory Challenges in Cellular Agriculture, *Trends in Food Science & Technology*, vol. 78, no. 0924-2244, pp.155–166

Tell, J., Hoveskog, M., Ulvenblad, P., Per-Ola Ulvenblad, Barth, H. & Ståhl, J. (2020). Business Model Innovation in the Agri-Food Sector, *IGI Global eBooks*, pp.1108–1122

Tell, J., Hoveskog, M., Ulvenblad, P., Ulvenblad, P.-O., Barth, H. & Ståhl, J. (2016). Business Model Innovation in the Agri-Food Sector, *International Journal of Social Ecology and Sustainable Development*, vol. 7, no. 2, pp.1–13

Troy, D. J. & Kerry, J. P. (2010). Consumer Perception and the Role of Science in the Meat Industry, *Meat Science*, vol. 86, no. 1, pp.214–226

Tuomisto, H. L., Allan, S. J. & Ellis, M. J. (2022). Prospective Life Cycle Assessment of a Bioprocess Design for Cultured Meat Production in Hollow Fiber Bioreactors, *Science of The Total Environment*, vol. 851, p.158051

van der Weele, C. & Driessen, C. (2013). Emerging Profiles for Cultured Meat; Ethics through and as Design, *Animals*, vol. 3, no. 3, pp.647–662

Verbeke, W., Marcu, A., Rutsaert, P., Gaspar, R., Seibt, B., Fletcher, D. & Barnett, J. (2015). 'Would You Eat Cultured Meat?': Consumers' Reactions and Attitude Formation in Belgium, Portugal and the United Kingdom, *Meat Science*, [e-journal] vol. 102, pp.49–58, Available Online: https://www.sciencedirect.com/science/article/abs/pii/S0309174014005014

Verbeke, W., Sans, P. & Van Loo, E. J. (2015). Challenges and Prospects for Consumer Acceptance of Cultured Meat, *Journal of Integrative Agriculture*, vol. 14, no. 2, pp.285–294

Verhulst, P. (2023). The Netherlands Allows Cultivated Meat Tasting, *I Amsterdam*, Available Online: https://www.iamsterdam.com/en/business/key-sectors-for-business/food/the-netherlands-first-in-eu-to-allow-cultivated-meat-tasting

Vinnari, M. & Tapio, P. (2009). Future Images of Meat Consumption in 2030, *Futures*, vol. 41, no. 5, pp.269–278

Weinrich, R., Strack, M. & Neugebauer, F. (2020). Consumer Acceptance of Cultured Meat in Germany, *Meat Science*, vol. 162, p.107924

Wilks, M. & Phillips, C. J. C. (2017). Attitudes to in Vitro Meat: A Survey of Potential Consumers in the United States, *PLOS ONE*, vol. 12, no. 2, p.e0171904

Zhang, Y. & Zhang, T. (2019). Review of Business Model Innovation, *Proceedings of the 2019 10th International Conference on E-business, Management and Economics - ICEME 2019*

8 Bibliography

Amit, R. & Zott, C. (2001). Value Creation in E-Business, *Strategic Management Journal*, vol. 22, no. 6-7, pp.493–520

Bohlmann, J. D., Spanjol, J., Qualls, W. J. & Rosa, J. A. (2012). The Interplay of Customer and Product Innovation Dynamics: An Exploratory Study, *Journal of Product Innovation Management*, vol. 30, no. 2, pp.228–244

Bryant, C. & Barnett, J. (2020). Consumer Acceptance of Cultured Meat: An Updated Review (2018–2020), *Applied Sciences*, [e-journal] vol. 10, no. 15, p.5201, Available Online: https://www.mdpi.com/2076-3417/10/15/5201 [Accessed 3 April 2024]

Circus, V. E. & Robison, R. (2018). Exploring Perceptions of Sustainable Proteins and Meat Attachment, *British Food Journal*, vol. 121

Davies, J. & Davies, D. (2010). Origins and Evolution of Antibiotic Resistance, *Microbiology and Molecular Biology Reviews*, [e-journal] vol. 74, no. 3, pp.417–433, Available Online: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2937522/

Dunphy, S. & Herbig, P. A. (1995). Acceptance of Innovations: The Customer Is the Key!, *The Journal of High Technology Management Research*, vol. 6, no. 2, pp.193–209

Eurostat. (2024). Price of Meat up 3.3% in One Year - Eurostat, *Ec.europa.eu*, Available Online: https://ec.europa.eu/eurostat/web/products-eurostat-news/w/ddn-20240405-1#:~:text=In%20February%202024%2C%20the%20price [Accessed 15 April 2024]

Guan, X., Qingzy, L., Qiyang , Y., Xueliang, L., Jingwen, Z., Guocheng , D. & Jian , C. (2021). Trends and Ideas in Technology, Regulation and Public Acceptance of Cultured Meat, *Future Foods*, [e-journal] vol. 3, p.100032, Available Online: https://www.sciencedirect.com/science/article/pii/S2666833521000228#bib0021

Kirsch, M., Jordi Morales-Dalmau & Lavrentieva, A. (2023). Cultivated Meat Manufacturing: Technology, Trends, and Challenges, *Engineering in Life Sciences*, vol. 23, no. 12

Lazarus, O., McDermid, S. & Jacquet, J. (2021). The Climate Responsibilities of Industrial Meat and Dairy Producers, *Climatic Change*, vol. 165, no. 1-2

Lee, S. W. (2022). Regression Analysis for Continuous Independent Variables in Medical Research: Statistical Standard and Guideline of Life Cycle Committee, *Life Cycle*, vol. 2

McGrath, R. & MacMillan, I. (1995). Discovery-Driven Planning, *Harvard Business Review*, Available Online: https://hbr.org/1995/07/discovery-driven-planning [Accessed 1 April 2024]

Meat – Beef, Lamb, Pork and Chicken. (2023). *Www.livsmedelsverket.se*, Available Online: https://www.livsmedelsverket.se/en/food-habits-health-and-environment/food-and-environment/eco-smart-food-choice/meat--beef-lamb-pork-and-chicken

Post, M. J., Levenberg, S., Kaplan, D. L., Genovese, N., Fu, J., Bryant, C. J., Negowetti, N., Verzijden, K. & Moutsatsou, P. (2020). Scientific, Sustainability and Regulatory Challenges of Cultured Meat, *Nature Food*, vol. 1, no. 7, pp.403–415

Prahalad & Ramaswamy. (2003). The New Frontier of Experience Innovation, *MIT Sloan Management Review*, Available Online: https://sloanreview.mit.edu/article/the-new-frontier-of-experience-innovation/ [Accessed 24 March 2024]

Risner, D., Kim, Y., Nguyen, C., Siegel, J. B. & Spang, E. (2023). Environmental Impacts of Cultured Meat: A Cradle-To-Gate Life Cycle Assessment, *bioRxiv*

Sarasvathy, S. (2008). Effectuation, *Effectuation: Elements of Entrepreneurial Expertise*

Spradley, J. P. (1980). Participant Observation, *Anthropological Quarterly*, vol. 53, no. 4, p.260

Swartz, E. & Olsen, T. (2023). Letter to UC Davis Regarding LCA Pre-Prints, *Google Docs*, Available Online: https://docs.google.com/document/d/1QYpKzoLigZD5IZ2B6gEkoDAiYUtsqgCJhISVm3xWMuE/edit

Treich, N. (2021). Cultured Meat: Promises and Challenges, *Environmental and Resource Economics*, [e-journal] vol. 79, no. 1, pp.33–61, Available Online: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7977488/ [Accessed 15 April 2024]

Wirtz, B. W. (2019). B2B Digital Business Models, *Progress in IS*, pp.161–173

WWF. (2023). Cost of Food: An Increasing Barrier for Europeans to Eat Sustainable Food, *Www.wwf.eu*, Available Online: https://www.wwf.eu/?10526466/Cost-of-food-an-increasing-barrier-for-Europeans-to-eat-sustainable-food

Ye, Y., Zhou, J., Guan, X. & Sun, X. (2022). Commercialization of Cultured Meat Products: Current Status, Challenges, and Strategic Prospects, *Future Foods*, vol. 6, p.100177

9 Appendix

9.1 Survey Questions

1. What is your gender?

2. How old are you? (In numbers)

3. Which of the following best represents your country of residence?

4. Which of the following ranges best represents your total annual household income before taxes?
    a. Less than €25,000
    b. €25,000 - €49,999
    c. €50,000 - €74,999
    d. €75,000 - €99,999
    e. €100,000 - €149,999
    f. €150,000 or more

5. How would you describe your current dietary preferences?
    a. Omnivore (consumes both meat and plant-based foods)
    b. Vegetarian (avoids meat but may consume animal by-products)
    c. Vegan (avoids all animal products)
    d. Flexitarian (mostly plant-based with occasional meat consumption)
    e. Other: specify

6. Are you aware of the environmental impact of traditional meat production (e.g., greenhouse gas emissions, land use, water consumption)? [Yes or No]

7. How often do you eat meat?
    a. Everyday
    b. 3-5 times a week
    c. 1-2 times a week
    d. A few times a month/Rarely
    e. Never

8. Have you heard of alternative protein source products such as fermentation-based products? [Yes or No]

9. Which of the following alternative meat products would you be willing to try?
    a. Fermentation-based alternatives
    b. Plant-based meat substitutes
    c. Insect-based protein products
    d. Lab-grown seafood

10. Do you know cultivated meat?
    a. Yes, I know

b. Yes, I heard of it, not in depth
c. No, not really

11. How willing would you be to try cultivated meat (meat grown from animal cells in a laboratory) if it became available in the market?
    a. Very willing
    b. Somewhat willing
    c. Neutral
    d. Somewhat unwilling
    e. Very unwilling

12. Given a positive answer, will it be for: [open answer]

13. If no, what would be your barrier? [open answer]

Cultivated meat objective's is to replicate the taste, texture, and nutritional profile of conventional meat without the need for animal husbandry.

Cultivated meat production uses up to 99% less land and 90% less water compared to traditional livestock farming.

Research shows that cultivated meat production produces up to 96% lower greenhouse gas emissions compared to traditional beef production.

Cultivated meat production does not involve the raising and slaughtering of animals, potentially improving animal welfare.

14. Based on what you have just read, do you perceive cultivated meat as a more ethical alternative to traditional meat production methods? [Yes, No, Unsure]

15. Will you consider balancing your alimentation with an alternative protein source such as cultivated meat? [Yes or No]

16. How important do you think it is for cultivated meat to closely resemble traditional meat in terms of taste and texture?
    a. Very important
    b. Somewhat important
    c. Neutral
    d. Not very important
    e. Not very important at all

17. Do you have any concerns about the safety that represent alternative meat products? [open answer]

18. How often per week would you eat cultivated meat if it were available on the market?

    a. Once

b. Twice
c. 3-5 times
d. As a substitute of traditional meat
e. Never

19. Do you believe there is a growing acceptance of cultivated meat in your country, and if cultivated meat was widely regarded as a symbol of sustainability and social responsibility, would you consider modifying your diet to include more cultivated meat products?
    a. Yes, I believe there is growing acceptance, and I would consider modifying my diet.
    b. Yes, I believe there is growing acceptance, but I would not consider modifying my diet.
    c. No, I don't believe there is growing acceptance, but I would consider modifying my diet.
    d. No, I don't believe there is growing acceptance, and I would not consider modifying my diet.
    e. Not sure / I prefer not to answer

20. Would you be willing to pay a premium for alternative meat products compared to traditional meat products? [Yes, No, Other:…]

21. How much would you be willing to spend for cultivated meat options roughly? Please give a percentage, it can be positive and negative (% is referring to the difference between traditional and cultivated meat prices, e.g., 0 = same price, 10 = +10% , -10 = -10% with respect to the traditional meat price) [open answer]

22. When you purchase food, which factor do you prioritize the most? (Please select 4 maximum)
    a. Price
    b. Quality
    c. Brand
    d. Nutritional value
    e. Biological source
    f. Environmental impact
    g. Convenience
    h. Taste
    i. Packaging
    j. Local/origin
    k. Social trends/identity related matters
    l. Health claims (e.g., gluten-free, non-GMOs)
    m. Other: …

23. Where do you typically seek information about food products and dietary choices?
    a. Television
    b. Social media
    c. News websites
    d. Food blogs/websites
    e. Scientific publications
    f. Other:…

24. Have you ever been influenced by friends, family, or social media influencers to try new food products? [Yes, No, Unsure]

25. Do you influence or try to influence others in dietary habits? [Yes, No, Unsure]

26. Do you think social influences play a role in promoting alternative meat products? [Yes, No, Unsure]

27. Could traditions or cultural factors influence your own attitudes towards alternative meat consumption? [Yes, No, Unsure]

28. How do you envision the future of food consumption in the next decade?
    a. Increased adoption of alternative meat products
    b. Continued reliance on traditional meat products
    c. A combination of both
    d. Other:…

29. In which time span do you think a household could have a balanced alimentation between cultivated and traditional meat?
    a. In 5 -10 years
    b. In 10 years
    c. In 10 to 20 years
    d. 20+ years
    e. Never

30. What would you need to feel safe in balancing your future diet with alternative protein foods?
    a. Transparency (about process and phases of lab-creation)
    b. Texture and cooking experience/habits
    c. More information on nutritional value
    d. Clear labelling on packaging (more transparent)
    e. Government regulations ensuring safety
    f. Positive reviews from trusted sources
    g. Health professional recommendations
    h. Affordable prices
    i. Tastings or samples to try before buying
    j. More variety of alternative protein options
    k. Assurance of environmental sustainability
    l. Other:…

9.2 Interview Questions

I. Re:Meat's Business Model Journey:

1. Could you outline the key steps involved in Re:Meat's Business Model innovation and market engagement? Specifically, what methodology or approach did you adopt in developing it, in terms of sequential steps?
2. During the design phase of your business model, what were the most challenging aspects you encountered?
3. Can you explain us any difficulties, unexpected occurrences, or significant learnings that arose during the process?
4. Considering our focus on Customer Segment, Customer Relationship, and Value Proposition components, what insights can you provide on these aspects, and how would you prioritize them? How have you considered Customer Experience in this context?
5. What barriers have you encountered in the development process? Taking into considerations factors such as regulatory challenges, technological limitations, consumer acceptance hurdles, ethical and environmental considerations, or scalability issues.

II. Future Perspectives:

6. How do you envision the cultivated meat industry evolving in the near future realistically?
7. What strategies do you anticipate employing to attract and retain customers amidst evolving market dynamics?

III. Results Confrontation and Insights:

8. Our survey findings suggest that transparency in production processes, affordability, and regulatory assurances regarding safety and health professional recommendations

are crucial for consumer trust in alternative proteins like cultivated meat. How feasible do you perceive achieving these objectives to be?

9. Among consumers hesitant to try cultivated meat, health concerns emerged as a primary factor in our findings. How do you plan to address these health concerns? Have you considered strategies such as government endorsements, labelling initiatives, or endorsements from health professionals?
10. As stated in your website, the solutions to overcome reluctance to try cultivated meat from customers' point of view are found by emphasizing taste, price, and convenience. However, if one of these objectives cannot be fully realized by Re:Meat, or generally speaking, have you devised contingency plans or alternative strategies?

9.3 Results of the Correlation Analysis

First Variable	Second variable	ρ coefficient	P-value	Relationship status
Knowledge of Cultivated Meat	Concerns about safety	-0.145	0.038	Negative
Awareness of Environmental impact	Perceived Healthiness	0.235	0.00073	Moderate Positive
Concerns about safety	Willingness to pay a premium	0.126	0.073	Negative
Dietary Preferences	Perceived Healthiness	0.1	0.153	Positive
Frequency of meat consumption	Willingness to pay a premium	0.077	0.276	Very Weak positive
Willingness to try after info	Awareness of Environmental impact	0.191	0.0063	Positive
Willingness to try after info	Knowledge of Cultivated Meat	0.159	0.0234	Positive
Willingness to try after info	Concerns about safety	-0.105	0.1359	Negative
Willingness to try after info	Frequency of meat consumption	0.051	0.47	Very Weak Positive
Willingness to try after info	Dietary Preferences	0.05	0.477	Very Weak Positive
Willingness to try after info	Perceived Healthiness	0.526	6.62E-16	Strong Positive
Willingness to try after info	Resemblance to Traditional meat importance	0.236	0.00066	Moderate Positive
Willingness to try after info	Willingness to pay a premium	0.394	5.52E-09	Strong Positive
Willingness to try after info	social influence importance	0.225	0.0012	Moderate Positive

9.4 Demographical Variables Analysis

- **Age**

Factor studied	Analysis	Test statistic	P-value
Willingness to try before receiving information	Anova	4.049	0.0016
Willingness to try after receiving information	Anova	2.769	0.0192
Sensory Experience	χ^2	56.935	0.000021
Perception of Healthiness	χ^2	30.493	0.00071
Willingness to Pay	Anova	4.68	0.015
Time span for balancing alimentation with cultivated meat	χ^2	57.15	0.0000195
Frequency of Meat Consumption	χ^2	18.394	0.561
How often will they eat cultivated meat if it was available in the market	χ^2	21.986	0.341
Willingness to pay a premium	Anova	6.160	0.802
Social influence	χ^2	4.05	0.399
Vision of the future food consumption	χ^2	22.635	0.0922

- **Gender**

Factor studied	Analysis	Test statistic	P-value
Sensory Experience	χ^2	24.203	0.00212
Perception of healthiness	χ^2	15.410	0.00392
Concerns about safety	χ^2	1.91	0.385
Frequency of Meat Consumption	χ^2	15.082	0.0576
Willingness to try before info	χ^2	8.669	0.371
Willingness to try after info	χ^2	2.803	0.246
How often will they eat cultivated meat if it was available in the market	χ^2	12.236	0.141
Willingness to pay a premium	χ^2	19.804	0.801
social influence	χ^2	0.48	0.975
Percentage/Price sensitivity	*Anova*	-1,769	0.0785
Vision of the future food consumption	χ^2	10.443	0.729
Time span for balancing alimentation with cultivated meat	χ^2	15.485	0.0504

- **Income**

Factor studied	Analysis	Test statistic	P-value
Willingness to try before receiving information	χ^2	37.247	0.01093
Willingness to try after receiving information	χ^2	12.105	0.0334
Role of Social influence	χ^2	22.89	0.011
Frequency of Meat Consumption	χ^2	19.189	0.510
Resemblance to Traditional Meat	χ^2	27.62	0.119
Perception of Healthiness	χ^2	11.94	0.289
How often will they eat cultivated meat if it was available in the market	χ^2	25.80	0.172
Willingness to pay a premium	χ^2	6.32	0.787
Percentage/Price Sensitivity	*Anova*	0.367	0.871
Vision of the future food consumption	χ^2	24.29	0.060
Time span for balancing alimentation with cultivated meat	χ^2	25.80	0.172

- **Country of Residence**

Factor studied	Analysis	Test statistic	P-value
Frequency of Meat Consumption	χ^2	66.89	0.015
Vision of the future food consumption	χ^2	65.68	0.00061
Time span for balancing alimentation with cultivated meat	χ^2	61.47	0.042
Concerns about safety	χ^2	28.88	0.00237
Willingness to try before information	χ^2	59.23	0.062
Willingness to try after information	χ^2	14.01	0.233
Resemblance to traditional meat	χ^2	54.15	0.140
Perception of Healthiness	χ^2	27.52	0.192
How often will they eat cultivated meat if it was available in the market	χ^2	46.19	0.382
Willingness to Pay a Premium	χ^2	22.21	0.448
Social Influence	χ^2	12.42	0.948
Percentage/Price sensitivity	*ANOVA*	22.72	0.910