UNIVERSITY of WORCESTER

Exploring the innovation process for the development of plant-based protein products within food companies in Germany through narrative inquiry

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Thesis submitted in fulfilment of the requirement for the degree of

Doctor of Business Administration

2026

University of Worcester

ABSTRACT

Animal-based food protein production contributes significantly to global greenhouse gas (GGG) emissions. A shift towards plant-based diets is widely recognised as beneficial for sustainability and health, leading to increased demand for plant-based protein food alternatives, with rapid growth and innovation in this sector. Germany, the largest European market for plant-based protein foods, provides a crucial context for this study.

Despite the sector's growing relevance, there is a lack of research on the innovation process from a management perspective, especially how small- and medium-sized enterprises (SMEs) engage in and manage collaborative innovation to support sustainability and health goals. This study addresses this gap by exploring the innovation process in Germany's plant-based protein food sector, with a focus on innovation development, collaboration, and the capabilities required for managing the innovation process.

Adopting a qualitative, inductive research approach within a moderate constructivism philosophy, the study employed narrative interviews with managers of plant-based protein food companies, supported by collectively constructed documentation. Intra- and inter-story analyses were conducted using storytelling for restoryings of interviews and the meta-framework of dynamic network-process for contextualisation. Narrative inquiry was chosen to capture the lived experiences of managers navigating complex innovation processes and to reveal the contextual depth of collaborative dynamics.

The results demonstrate that the development of plant-based protein foods is a dynamic, iterative process shaped by the interplay of agility, creativity, and efficiency. Successful innovation is enabled by management adaptability, employee engagement, and strategic partnerships grounded in shared sustainability goals. The study identifies a "grey zone of openness" in collaborative relationships, where companies balance knowledge sharing with competitive protection.

This study contributes to theory by developing a novel framework of management capabilities for collaborative food innovation by identifying three key management capabilities required for effective collaborative innovation in the plant-based protein

food sector: Transformational leadership, entrepreneurial understanding and knowledge management. From a practical perspective, the findings offer actionable insights for managers in sustainability- and health-driven food sectors, especially in navigating collaboration across organisational boundaries. Methodologically, the study demonstrates the value of narrative inquiry in capturing complex, context-dependent innovation process dynamics and translating them into accessible, practice-relevant knowledge.

ACKNOWLEDGEMENTS

Writing this DBA thesis has been a journey that, while demanding a considerable investment of time and energy, has allowed me to grow beyond what I thought possible. Balancing professional responsibilities, family life, and the demands of doctoral study was not always easy. Yet, through this process, I have learned a lot about new academic methodologies, about management insights in the plant-based protein innovation process, and most importantly, about myself and my personal resilience in seeing such a substantial project through to completion.

I would like to express my sincere gratitude to Dr Vessela Warren and Professor Robin Bell, who have guided me academically throughout this project. Their continuous encouragement, insightful feedback, and thought-provoking challenges have been invaluable. Our meetings were always fruitful and inspiring.

I am also deeply thankful to the participants of this study for taking the time to engage in the “adventure” of narrative interviews. It was a truly enriching experience to learn from each of you.

Furthermore, I would like to thank my academic and professional network for the critical exchange and motivation throughout my DBA journey. I am especially grateful for the inspiring new encounters that have resulted from the DBA project.

A heartfelt thank you goes to my friends for your interest, support, and for never tiring of asking how things were progressing. A special thanks to my best friend Ariane for your time and unwavering support during the final phase of my thesis. Your final proofreading was of immeasurable value.

I am also grateful to my DBA cohort, Jenny, Gianluca, and Christian, for sharing this journey, for our regular meetings and mutual support along the way.

My deepest thanks go to my family, my husband Marco, and my sons Hannes and Konrad, for your unwavering support, belief in me, and for bearing with me through the stressful times and moments of doubt. I could not have done this without you. I love you dearly.

This thesis is dedicated to you and to my father Gustav, who passed away at the beginning of my DBA journey. I felt your support every day and know you would have been so proud.

DISSEMINATION OF DBA WORK

Oct 2025	Academic conference “Towards new food systems”, Berlin, poster presentation, abstract accepted (14/07/2025): “Bridging organisational mindsets: Management capabilities for collaborative innovation in Germany´s plant-based protein food sector”
Jan 2025	Postgraduate network present & share (University of Worcester), online presentation: “The future of food is plant-based. Exploration of the process of plant-based protein food innovation” (Focus on methodology)
May 2022	Doctoral colloquium (University of Worcester, University of Gloucestershire), poster presentation

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ABBREVIATIONS

AI	Artificial Intelligence
B2B	Business to Business
B2C	Business to Consumers
BMEL	German Federal Ministry of Agriculture and Food
BMI	Business Model Innovation
F&B	Food & Beverages
GGG	Global Greenhouse Gas
GDPR	General Data Protection Regulation
IP	Intellectual Property
ZEW	Leibniz-Zentrum für Europäische Wirtschaftsforschung
SMEs	Small- and Medium-sized Enterprises
R&D	Research & Development
RQ	Research Question
SiW	Sharing is Winning
Q&A	Questions and Answers
NDA	Non-Disclosure-Agreement
NGO	Nongovernmental Organisation

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1 INTRODUCTION

1.1 BACKGROUND OF THE STUDY

The increasing shift towards more plant-based diets leads to growing consumer-demand for plant-based protein alternatives. In response, pioneering food companies are at the forefront of developing plant-based protein food innovation (Profeta, Märdian and Wolfram, 2021; Saari *et al.*, 2021). Despite the economic importance of the food industry, it is typically described as a mature and slow-growing area of business characterised by incremental innovation (Baregheh *et al.*, 2012; Tarabella *et al.*, 2019). The innovative plant-based protein food sector is an exception and serves as an example of food innovation for sustainability and health. Therefore, this study aims to explore and learn from the innovation process experiences of plant-based protein food companies. The purpose is to understand how food innovation for sustainability and health can be effectively fostered from a process-management perspective.

While innovation is recognised as a crucial lever for transforming the food system and promoting healthier and more sustainable diets (Baregheh *et al.*, 2012; European Commission, 2021; Smart Protein Project, 2021), the process of transforming the food system is complex and affects the entire food-processing chain from agricultural production and food processing to the distribution of food to consumers (Baregheh *et al.*, 2012). Given the complex and interconnected challenges faced by the food system, collaboration is essential in order to drive plant-based protein food innovation to achieve sustainability and health. Developing plant-based protein food requires diverse expertise, resources, and technologies that no single organisation can provide alone. Collaborative efforts bring together the knowledge, investment, and capabilities from various stakeholders, including startups, established companies, research institutions, and policymakers. This collective approach not only accelerates the innovation process but also enhances product quality and ensures scalability (European Commission, 2020).

Despite the recognised importance of collaboration, there are still significant gaps in the understanding of whether collaboration actually takes place and how it functions in the context of plant-based protein food innovation. To fill this knowledge gap, the study

explores the innovation process in the plant-based protein food sector. The aim of this study is to explore and gain an in-depth and contextual understanding of the plant-based protein innovation process in food startups and SMEs in Germany, to map collaboration in the innovation process, and to identify capabilities required for the management of the process.

Business experts and associations, such as the German Association for Alternative Protein Sources, “Bundesverband für alternative Proteinquellen e.V.” (2025), suggest that established food companies and organisations could play a crucial collaborative role in the plant-based protein food innovation process, in particular as potential production partners for emerging plant-based protein food companies. However, these experts also point out the challenges that arise when traditional and nascent plant-based protein food companies collaborate, such as corporate cultural conflicts and management issues (Bundesverband für Alternative Proteinquellen e.V., 2025).

This study aligns with and is informed by the broader policy initiatives that encourage collaboration in the food sector. The European Commission calls for collaboration through initiatives such as the Farm-to-Fork Strategy and Food 2030, recognising that coordinated actions are essential to deal with issues such as resource scarcity, climate change, and public health (European Commission, 2020, 2025). The Commission seeks to build resilient, inclusive, and sustainable food systems, by fostering collaboration across multiple actors in the food sector. This approach aims to address the needs of a growing population while minimising environmental impact. The next section describes the context of the research study within the food industry in Germany, with a particular focus on innovation and the plant-based protein food sector.

1.2 CONTEXT OF THE STUDY

1.2.1 The food industry in Germany

Germany boasts the largest retail market for food and beverages in Europe. The total revenue from food retailing experienced a notable increase of 8.2 percent, amounting to EUR 227 billion by 2020. Additionally, significant distribution channels include the export of processed foods, which generated EUR 61.6 billion, and food service sales, which reached EUR 53.6 billion (Germany Trade and Invest, 2021). Germany's food and beverage (F&B) industry is the fourth largest industry sector in Germany, generating a production value of EUR 185.3 billion in 2021. The F&B industry includes the beverage industry, animal feed, and food manufacturers. The latter form the food industry which counts for a turnover of EUR 165.01 billion in 2021 (Statistisches Bundesamt, 2025). The two largest segments of the food industry, based on production value, are animal protein production. The largest segment of meat and sausage products had a share of 30.7%. The second-largest segment of dairy and dairy products was 18.5% in 2021 (Germany Trade and Invest, 2021). There were approximately 5,559 companies in the German food industry in 2024, 90% of which were small to medium-sized enterprises (SMEs) (Statistisches Bundesamt, 2024).

1.2.2 Innovation in the food industry in Germany

According to the Leibniz-Zentrum für Europäische Wirtschaftsforschung (ZEW) overall investment of the food industry in innovation counted for EUR 2,18 billion in 2023 (ZEW, 2025). Innovation investments in 2023 are divided into Research & Development (R&D) (31%), industrial process investments (43%), and other unspecified innovation investments (25%). In 2023, around five percent of all companies in the food industry in Germany, with product innovations, introduced at least one market innovation. These companies were defined as having been the first to introduce at least one new or significantly improved product to the company's relevant market in the previous three-year period. (ZEW, 2025). The innovation intensity of the food industry in Germany is approximately 1 percent in 2023. Since 2008, innovation intensity has ranged between

1 and 2 percent. Innovation intensity in the food industry refers to the share of innovation expenditure of all companies in the total turnover of the industry (ZEW, 2025). Compared with the average across the entire industrial sector in Germany, the food industry exhibits lower levels of innovation investments, innovator participation, and innovation intensity (ZEW, 2025).

ZEW (2025) also measured the share of market innovations and me-too innovations in the total turnover of the German food industry from 2008 to 2023. According to ZEW, market novelty refers to products that a company was the first to introduce. Me-too innovations are new products from a company that were already being offered by other companies at the time of launch. In the period evaluated, the share of me-too products was on average three times as high as the share of market novelties, with a peak during the Covid pandemic years.

Furthermore, an online survey of the German Institute of Food Technology among 89 food companies revealed three main reasons for innovation: 82.9 % of respondents stated that their company fundamentally strives to be innovative as motive for developing innovations, followed by consumer demand (46.9%) and competitiveness (33.3%) (Profeta, Märdian and Wolfram, 2021).

The German food industry's moderate innovation landscape features a cautious approach despite significant investments, primarily in process innovation. Companies prioritise me-too innovations over market novelties, reflecting a conservative strategy. This approach persists even as businesses acknowledge innovation's crucial role in maintaining competitiveness and meeting consumer demands. The industry's innovation metrics lag behind other industrial sectors. These findings lay the groundwork for examining innovation in the plant-based protein sector, which the next section explores.

1.2.3 Plant-based protein food and innovation

This study follows the definition of plant-based protein food by Aschemann-Witzel et al. (2020), who defined plant-based alternative proteins as those replacing animal-based proteins. Clark and Bogdan (2019) expanded this definition to include plant-based meat replacement products and other plant-based products that do not necessarily mimic meat.

A comprehensive definition, product categories, and process technologies of plant-based protein foods for this research study are summarised in Figure 1.1.

Furthermore, Figure 1.1 underscores the complexity and potential of this sector, highlighting key areas of focus for future research and development in plant-based protein alternatives.

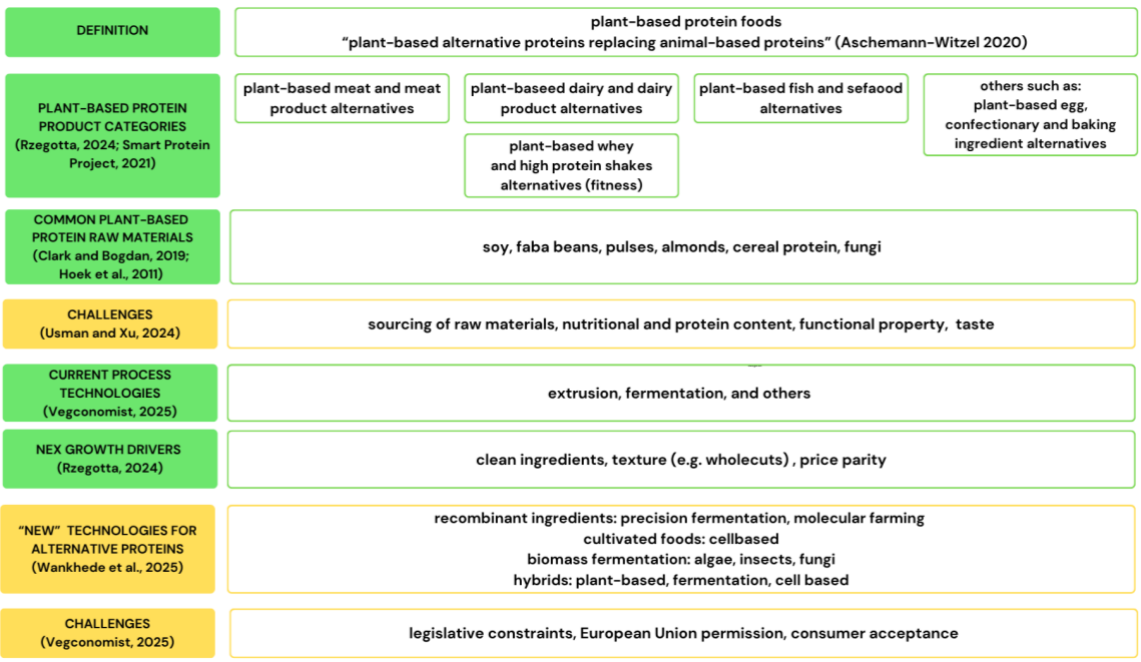

Figure 1.1 Comprehensive definition, product categories, process technologies, and focus for future research and development of plant-based protein foods (own illustration)

Common plant-based protein sources include soy, faba beans, pulses, and almonds (Clark and Bogdan, 2019). Hoek et al. (2011, p.662) describe plant-based protein alternatives as "primarily vegetable-based, containing proteins made from pulses, cereal

protein, or fungi". Food companies face complex challenges in the development of plant-based protein products. The most important considerations include the sourcing of raw materials, nutritional and protein content, functional properties, and taste (Usman and Xu, 2024).

The industry is focusing on clean ingredients, improved texture (e.g. whole cuts), and price parity with animal-based protein products as the next growth drivers for plant-based protein foods. These factors are likely to drive innovation and consumer acceptance in the coming years (Rzegotta, 2024).

Authors further emphasise the importance of disruptive technologies for future food innovation. They highlight biomass fermentation, precision fermentation, and recombinant ingredients as key technologies for the development of alternative protein foods. These technologies facilitate the production of animal-free proteins, functional ingredients, fats, and oils, all of which are essential for developing high-quality plant-based protein food products. Representing the forefront of innovation in the plant-based protein sector, these emerging technologies have the potential to address some of the current challenges and limitations. However, their current role remains limited owing to legislative constraints, European Union permissions, and consumer acceptance (Vegconomist, 2025; Wankhede et al., 2025).

Innovation in the plant-based protein sector has gained traction in the food industry, in response to the need for innovation in health and sustainability. Researchers have underlined the health benefits of plant-based protein foods. Contini et al. (2020) argue that the nutritional benefits of these foods help overcome barriers to preparing vegetable dishes and contribute to improved diet healthiness. Aschemann-Witzel et al. (2020) highlighted that excessive consumption of meat proteins in industrialised nations is harmful to health, making plant-based protein products a plausible alternative. However, there is no consensus among researchers on whether it is possible to produce sufficient plant-based proteins with the same nutritional protein profile as meat.

Furthermore, the German Institute of Food Technology revealed how food companies are addressing the transformational challenges of sustainability and health by

introducing innovations with sustainable raw materials, healthier ingredients, sustainable packaging and plant-based proteins. Notably, more than a quarter of the surveyed food companies reported engaging in innovations involving plant-based proteins, an area which forms the focus of this study (Profeta, Märdian and Wolfram, 2021). The market for plant-based proteins in Germany, as the regional scope of this study, is outlined in the subsequent section.

1.2.4 The plant-based protein food market in Germany

Germany has the largest market in Europe for plant-based alternative protein foods. Retail sales reached almost EUR 1.9 billion in 2023, with significant growth rates (11% vs. 2021 and 42% since 2020)(GFI, 2023). Germany is considered an important market for plant-based protein foods globally due to high consumer acceptance and awareness, as well as the availability of product variety in this category (Euromonitor International, 2020). Plant-based protein food products are distributed in retail and food service channels, for which no current figures are available.

In Germany, at least 90 food companies are primarily focused on developing plant-based protein food products. Besides startups, more established animal protein-based food companies are increasingly recognising the potential of this market. They have broadened their product lines to include plant-based protein options, invested in startups, or provided manufacturing capabilities and ingredients for this sector (GFI, 2023).

The categories of plant-based protein food products are shown in Figure 1.1. The main categories, according to the sales value of their animal-based equivalents, are plant-based protein alternatives to milk and other dairy products, as well as plant-based meat and processed meat products.

There has been a decrease in dairy consumption per person, as more consumers are choosing dairy alternatives. In Germany, dairy alternatives account for one out of every ten litres of milk produced (Germany Trade and Invest, 2021). The market for plant-based milk alternatives is rapidly expanding in Germany, reaching a retail sales value of

EUR 552 million by 2022 (GFI, 2023). This situation is similar for the meat alternative protein market. The production and demand for meat and meat products have been decreasing slightly per capita in recent years (Germany Trade and Invest, 2021). However, the demand for meat alternatives is increasing. 41% of German people report consuming plant-based meat at least once a month, and 25% express an intention to increase their consumption of plant-based meat in the future (GFI, 2023). In 2022, Germany produced plant-based meat worth EUR 537 million, marking a 12% rise from 2021 and an 82% increase since 2019 (GFI, 2023). Nearly every category of plant-based proteins experienced an increase in sales by 2022, with seafood alternatives seeing a 52% rise (GFI, 2023).

A 2023 nutrition report of the German Federal Ministry of Agriculture and Food revealed that 18% of the survey participants aged 14-29 years consumed plant-based protein alternatives daily (BMEL, 2023). Nevertheless, it's not just the younger demographic; a significant number of German consumers are now reconsidering diets that include animal products. The nutrition report 2023 revealed curiosity (73%) followed by environment (63%), animal welfare (63%), taste (63%), and health (48%) as main reasons among German consumers for purchasing plant-based protein food products (BMEL, 2023).

Clark and Bogdan (2019) explain the increase of plant-based protein foods is due to growing consumer awareness of the negative impact of meat and animal derived products on the environment, human health and animal welfare. Plant-based protein foods have transitioned from a niche market to a significant trend in Germany, as well as across western Europe and North America (Clark and Bogdan, 2019; Saari et al., 2021; Smart Protein Project, 2021).

Against the background and context of this study, the next section sets out the rationale for this thesis.

1.3 RATIONALE FOR THE STUDY

1.3.1 Gaps in theoretical knowledge

Despite the increasing importance of plant-based protein foods and collaborative innovation in the food industry, several gaps in theoretical knowledge persist.

Firstly, the literature on food innovation shows that existing research focuses predominately on food technology research and advancements in product formulations rather than on how innovation processes are organised and managed. Accordingly, there is limited management-oriented research on how companies in the plant-based sector develop and manage innovation processes (Aschemann-Witzel, 2015; Tachie, Nwachukwu and Aryee, 2023). This gap underscores the need for an in-depth understanding of how companies in this emerging field innovate, as well as manage their innovation processes (Bertello, De Bernardi and Ricciardi, 2024).

Secondly, the literature review of collaborative food innovation indicates that, despite the maturity of the food sector, collaboration in food innovation remains under-researched, with only a small number of studies addressing inter-organisational collaboration in innovation (Sarkar and Costa, 2008; Bigliardi and Galati, 2013b; Lefebvre, Steur and Gellynck, 2015; Procopio Schoen, 2017). This gap is particularly significant considering the complex sustainability and health challenges confronting the food system and the potential benefits that collaborative approaches can offer (Augustin *et al.*, 2021; Gazdecki, Leszczyński and Zieliński, 2021). Notably, empirical research that explores how such collaboration is organised and managed within the plant-based protein food sector is non-existent, underscoring a critical knowledge gap.

While scholars emphasise the increasing need for multi-actor collaboration in the plant-based protein food sector (Kaplan and McClements, 2025; Magdum *et al.*, 2026), existing studies offer little empirical insights into how food companies organise collaborative innovation processes (GFI, 2022; Hefferon *et al.*, 2023). This absence of empirical evidence confirms the gap in research into collaborative food innovation processes in this sector.

Thirdly, although the model of networked innovation provides a useful theoretical lens for conceptualising collaborative innovation processes in this study (Valkokari, Paasi and Rantala, 2012), its application in food industry contexts remains limited (Bresciani, 2017; Krasnokutska et al., 2024). As a result, the potential of the networked innovation model in explaining how food companies can effectively leverage external resources and partnerships in their innovation processes in the plant-based protein food sector lacks empirical evidence; a gap that this study addresses.

Fourthly, the literature on management capabilities shows that research investigating the management capabilities necessary for implementing open or collaborative innovation in the food sector remains scarce (Traitler, Watzke and Saguy, 2011; Antonaras and Dekoulou, 2016; Mendoza-Silva, 2020). Only a few studies have addressed such capabilities (Procopio Schoen, 2017; Bigliardi et al., 2021). This represents a further theoretical gap, particularly within the plant-based protein food sector, regarding which management capabilities food companies require to effectively leverage external partnerships and knowledge flows.

1.3.2 Gaps in practice

The practical gaps identified also build directly on insights from the literature review. The literature on types of innovation shows that the food industry remains dominated by incremental innovation, which limits significant advancements in sustainability and health (Holman, Devane and Cady, 2017; Tarabella et al., 2019). In contrast, the success of the plant-based protein food sector demonstrates the potential for more transformative, consumer-driven innovation (Saari *et al*., 2021). However, there is a lack of understanding about how such radical innovation processes can be fostered and managed in traditional food industry settings.

Plant-based protein food innovation is largely driven by startup companies operating within highly agile, knowledge-intensive innovation ecosystems, as outlined in the context of this study. However, the literature review shows little guidance as to how traditional food companies can adopt networked innovation models to participate

effectively in this innovation space (Bigliardi and Galati, 2013; Hefferon *et al.*, 2023; Hussain and Li, 2025). This gap hinders the broader adoption of collaborative innovation approaches that could drive sustainability and health improvements in the food system.

Moreover, knowledge about the management capabilities required for implementing and managing these collaborative innovation processes across the food industry sectors and other stakeholders remains limited (Procopio Schoen, 2017; Bigliardi et al., 2021). This gap makes it especially challenging for traditional food industry companies to approach collaborative innovation and benefit from it.

Scholars also emphasise that multi-actor collaboration is needed to advance the development of plant-based protein food innovation, which is currently led by agile startups. These developments imply that traditional food industry companies require enhanced entrepreneurial, knowledge and networking capabilities to collaborate effectively and participate in the protein transition (Lurie-Luke, 2024; Kaplan and McClements, 2025). These capabilities remain underdeveloped in the literature.

Addressing these gaps is crucial for advancing collaborative innovation in the plant-based protein food sector. This study seeks to explore the collaborative innovation processes within plant-based protein food companies. Ultimately, this research supports the transformation of food systems towards sustainability and health. Given the identified gaps in theory and practice, the next section outlines the study´s aim and research questions.

1.4 RESEARCH AIM AND QUESTIONS

The aim of this study is to explore and gain an in-depth and contextual understanding of the plant-based protein innovation process in food startups and SMEs in Germany, to map collaboration in the innovation process, and to identify capabilities required for the management of the process. The research aim was specified through the research questions (RQs) and corresponding objectives.

RQ 1: What is the innovation process for developing plant-based protein products within food startups and SMEs in Germany?

Researchers advocate for a deeper understanding of the plant-based protein food innovation process from a management perspective (Aschemann-Witzel *et al.*, 2020). This study explores the plant-based protein innovation process of food startups and SMEs, offering an in-depth and contextual understanding. This research contributes to theoretical knowledge and practice to managing food innovation processes in this emerging sector, as well as in other sustainability- and health-driven sectors in the food industry.

RQ 2: How do plant-based protein food startups and SMEs collaborate with their network in the innovation process?

This research maps the actors and relationships within the network of plant-based protein food startups and SMEs in the food value chain. This includes suppliers, retail companies, and other actors such as research institutions that are part of their network in the innovation process. This study emphasises the collaborative relationships between companies within the plant-based protein food sector and established animal-based food companies, which primarily play a co-manufacturing role in the innovation process. This research question addresses the scarcity of studies on collaborative innovation in the food industry and contributes to empirical research on networked innovation within the sector.

RQ 3: What capabilities are required to manage the innovation process in the plant-based protein food industry?

This study explores the capabilities employed to manage the plant-based protein food innovation process effectively, drawing from the literature and empirically identifying sector specific capabilities. This study addresses the gap in theoretical knowledge and the lack of practical guidance for managing collaborative food innovation processes that aim to enhance sustainability and health.

To guide the exploration and address the research questions, the researcher set clear objectives to achieve academic findings, as presented in the next section.

1.5 RESEARCH OBJECTIVES

The research questions´ corresponding objectives of the study are outlined as follows:

1. To gain an in-depth and contextual understanding of the plant-based protein food innovation process
2. To map the actors and relationships within the network of plant-based protein food startups and SMEs in the innovation process
3. To identify the capabilities for the management of the innovation process in the plant-based protein food industry

Based on the outline of the aim, questions, and objectives of the thesis, the final sections of the introduction chapter outline the chosen research approach and thesis structure which includes primarily narrative interviews.

1.6 RESEARCH SUMMARY

This research is grounded in the philosophy of moderate constructivism, which asserts that knowledge is constructed through individuals' interactions and subjective experiences. This perspective is particularly relevant for studying innovation processes in the plant-based protein food sector as it allows for an in-depth understanding of how managers create meaning from their experiences and interactions (Makkonen, Aarikka-Stenroos and Olkkonen, 2012).

A qualitative research approach was employed to achieve the research objectives through the narrative inquiry research strategy. Narrative inquiry is particularly effective for exploring the complex and dynamic nature of innovation processes, as it captures the rich detailed stories of participants (Makkonen, Aarikka-Stenroos and Olkkonen, 2012). Narrative interviews with managers of plant-based protein food companies

served as the primary data source, providing insights into their innovation processes and collaborative relationships.

Analyses were conducted in two phases: Intra- and inter-story analysis (Chautard and Collin-Lachaud, 2019). In the first phase of intra-story analysis, the researcher restoried the individual interview accounts. In the second phase of inter-story analysis, individual experiences of the companies' innovation processes were synthesised through both a thematic analysis and a meta framework adapted from Makkonen, Aarikka-Stenroos and Olkkonen (2012).

The researcher selected participants based on their involvement in the plant-based protein food sector, ensuring a diverse representation of companies with a purely plant-based protein food product assortment. The interview process was designed to elicit rich narratives, focusing on the participants' experiences with innovation and collaboration. Additional data sources, such as publicly accessible companies and conference or workshop documentation, were used for the context and corroboration of the data.

1.7 STRUCTURE OF THE THESIS

This thesis is structured into six main chapters, each addressing different aspects of research on collaborative innovation in the plant-based protein food sector. This well-structured approach guarantees a comprehensive exploration of the collaborative innovation processes in the plant-based protein food sector, providing valuable insights for both academic and food industry audiences.

Chapter 1, the introduction, sets the stage for this study by providing its background, context, and rationale. It details the research aim, questions, and objectives, and introduces the research approach adopted for the study.

Chapter 2, the literature review, delves into existing research on innovation, collaboration, and management capabilities in the food industry, with a particular focus on plant-based protein foods.

Chapter 3, which focuses on the research methodology, elaborates on the research philosophy, approach, and strategy employed in the study. It outlines the data collection methods, including narrative interviews, and the analytical techniques used to interpret the data. Additionally, the role of the researcher, ethical considerations and the quality of the study are thoroughly discussed.

Chapter 4, researcher´s storytelling of the micro narratives, presents the findings of the intra-story analysis (phase 1 of analyses of this study). The findings highlight the individual experiences of interviewees with their innovation processes.

Chapter 5 presents the findings of the inter-story analysis (phase 2 of analyses). The findings synthesise and reconstruct the plant-based protein food process, and identify common themes and patterns related to collaboration and management capabilities, across narratives.

Chapter 6 discusses the findings in relation to existing literature on food innovation processes, collaboration and innovation management capabilities required.

Chapter 7, the conclusion, summarises the responses to the three research questions and this study's contribution to theory, methodology, and practice. It reflects on the research limitations and suggests avenues for future research. The chapter concludes with personal reflections.

The next chapter presents the literature review.

2 THE LITERATURE REVIEW

2.1 INTRODUCTION

The literature review´s aim is to deliver a comprehensive understanding of the key concepts supporting this research: food innovation, collaboration in food innovation processes, and capabilities required to manage innovation processes. These concepts are central to the research questions and are explored in-depth throughout this review.

The following sections present the current state of research on the concepts in a general context and relate them specifically to the food industry. It is important to note that there is limited literature specifically examining these concepts in the plant-based protein food sector (Aschemann-Witzel *et al.*, 2020). Therefore, this review draws on broader literature from the food industry, especially food SMEs, as they represent a significant portion of today's food industry in Germany (Statistisches Bundesamt, 2024) to provide context and insights.

By exploring these areas, this chapter aims to identify gaps in the current literature and provide a foundation for the understanding of the food innovation process within the context of the plant-based protein food sector. These gaps will be further investigated through a qualitative narrative inquiry approach using interviews with purely plant-based protein food companies to explore and gain an in-depth and contextual understanding of the plant-based protein innovation process in food startups and SMEs in Germany, to map collaboration in the innovation process, and to identify capabilities required for the management of the process.

The next section explores the concept of innovation and its application in the food industry, with a particular focus on innovation processes. The section begins by examining general innovation concepts and then narrows the focus to the food sector.

2.2 FOOD INNOVATION

2.2.1 Definition and importance of innovation

Innovation is a key factor in driving a company's success and maintaining its competitiveness. Innovation plays a crucial role in determining higher performance and ensuring a company´s survival in the market. Innovation can be determined by external environmental pressure, especially that of "competitiveness, deregulation, shortage of resources, and customer demand" (Bigliardi et al., 2020, p.2). However, innovation can not only contribute to a company's success but is also academically discussed to create value outside the company boundaries (Breuer and Lüdeke-Freund, 2014).

Baregheh et al. (2012, p. 1334) adds the process perspective and defines "innovation as the multistage process whereby organisations transform ideas into new and improved products, services or processes, in order to advance, compete and differentiate themselves successfully in their marketplace". Baregheh et al. (2012) and Bigliardi et al. (2020) define innovation itself as a result or outcome of the innovation process. Menrad (2007) describes innovation as a complex concept involving the creation, dissemination, and transformation of scientific or technical knowledge into new or improved products and services and new production or processing procedures. Furthermore, Bigliardi and Galanakis (2020, p.316) add the importance of innovation implementation. "It is a new idea that when implemented leads to a more effective process, product, service, or technology." Innovation provides better solutions that meet advanced, unaddressed, or existing market needs. It can be considered as a breakthrough that provides a different way of thinking, consuming, or living. However, the key element of innovation is the precondition noted above "when implemented". "Without implementation, innovation turns back into the idea status" (Bigliardi and Galanakis, 2020, p. 316). Additionally, Bigliardi et al. (2020) argue that a company can change both its behaviour and its organisation in order to improve its performance and remain competitive

These various definitions suggest that innovation is either characterised as a multistage process or as a result of an innovation process. Additionally, the authors highlight the key determinants of innovation, such as competitiveness, deregulation, resource

scarcity, and customer demand. These insights serve as a foundation for further discussion of innovation in this section. The following sections explore innovation both as a process and in terms of types, from an innovation outcome perspective. Moreover, the significance of sustainability within the food industry, particularly in the realm of innovation, is further explored. This exploration serves as a crucial basis for addressing this study´s research questions concerning the innovation process in the plant-based protein food sector.

The following section discusses the characteristics of innovation in the food industry.

2.2.2 Characteristics of innovation in the food industry

Food innovation is characterised as innovation in the food sector or rather food manufacturing industry. Historically, the food industry has been seen as a traditional and mature field, characterised by low levels of innovation and minimal R&D investment compared to other sectors (Garcia Martinez and Briz, 2000; Beckeman and Skjöldebrand, 2007). This is accompanied by a higher failure rate for new product launches than in more dynamic industries (Menrad, 2007). Additionally, the rate of technological advancement, as indicated by the number of patented inventions, is lower in this industry than in other manufacturing fields (Garcia Martinez and Briz, 2000). Nonetheless, researchers acknowledge the critical role of innovation in enhancing food sector competitiveness (Grunert *et al.*, 2005; Rama and von Tunzelmann, 2008; Capitanio, Coppola and Pascucci, 2010). Similarly, Bigliardi and Galanakis (2020) emphasise that innovation is essential for food industries to maintain market competitiveness. Innovation in the food sector is not just an option, but a necessity for its long-term sustainability. It is fundamental for differentiating from competitors and fulfilling consumer demands. Ultimately, innovation is crucial for thriving in tough economic times, entering new markets, and creating new products or processes (Galanakis, 2021).

Moreover, Zickafoose, Lu and Baker (2022) suggest that food innovation is increasingly characterised by food-system complexity, spanning the agricultural value chain and

involving health, sustainability, and technological considerations. The authors provide an updated definition, stating that “food innovations aid in the development, production, or transportation of new food products, process, or technology to promote human health, food security or environmental sustainability” (Zickafoose, Lu and Baker, 2022, p.1). They also identify plant-based protein food innovations, respectively plant-based meat alternatives, with the highest expected availability to consumers within a five-year time-horizon.

The discussion of food innovation characteristics forms the basis for a closer look at types of innovation, from general concepts to specific types of innovation prevalent in the food industry.

2.2.3 Types of innovation: From general concepts to food industry application

Innovation encompasses a wide range of ideas and takes on multiple forms across different industries. Several typologies have been proposed to categorise innovation in a broader context. Baregheh et al. (2012) and Bigliardi et al. (2020) identified innovations as outcomes of the innovation process, encompassing product or service modifications, novel processes for enhanced productivity, and new marketing strategies or management systems for improved operational efficiency. Geissdoerfer et al. (2018) expand this view by including the concept of replacing existing products or services with new offerings.

Oke, Burke and Myers (2007) provide a more nuanced categorisation, distinguishing between product innovation, which includes both radical and incremental innovations, service innovation, and process innovation compromising organisational, service, and production innovations. Building on these ideas, Francis and Bessant (2005) introduced the 4P framework, which has gained significant traction in innovation literature. In this framework, four types of innovation are distinguished: product innovation, i.e. changes in products or services, process innovation, i.e. changes in e.g. production, position innovation, i.e. changes in the context of the introduction of products or services, and

paradigm innovation, i.e. changes in the underlying intellectual models that guide organisational activities.

A more specific pattern emerges when examining these innovation types in the context of the food industry. Product and process innovations dominate the landscape, with Menrad (2004) finding that two-thirds of German food companies primarily engage in these types of innovations. Capitanio, Coppola and Pascucci (2010) observed a tendency towards process innovations in Italian food companies, with product innovations being largely incremental. The relationship between product and process innovation in the food sector is often symbiotic. Brewin, Monchuk and Partridge (2009) identified an inter-relationship between the two and Weindlmaier (2001) noted that the distinction is not always clear-cut. This inter-relationship is exemplified in the plant-based protein food sector, where companies such as Vegetarian Butcher (Netherlands) and Gold & Green Foods (Finland) have created innovative products through both new recipes and new production technologies (Saari et al., 2021).

Market innovation, outlined as "the exploitation of new territorial markets and the penetration of new market segments within existing markets" (Avermaete *et al.*, 2003) is another crucial innovation type in the food industry. (Grünert *et al.*, 1997) consider market orientation as a distinct innovation type, alongside product, process, and service orientations. A high degree of market innovation is typical for R&D-intense food products, like functional foods (Bigliardi and Galati, 2013a).

Other types of food innovation include packaging as a distinct type of innovation, noting its evolution from a simple container to an active component in food quality (Gellynck and Vermeire, 2009). Bigliardi and Galanakis (2020) reference Earle´s (1997) work, which differentiated between technological, social, and cultural innovations, emphasising that a successful food product must integrate these three types of innovations to meet nutritional, personal, and social needs, as well as customer demands.

Strategic innovation, particularly "business model innovation" (BMI), is rarely found in food innovation today. When applied to the food context, the reasons to implement BMI are mainly health and sustainability concerns, as changing consumer demand

requires the integration of advanced technological solutions and new business models (Sarkar and Costa, 2008; Bigliardi and Galanakis, 2020). Therefore, BMI can be observed in the plant-based protein food sector (Saari *et al.*, 2021). BMI involves changing the entire business model or its specific components in response to challenges, opportunities, or changes in the company's environment, or as a means of diversification and innovating. This can encompass creating entirely new business models such as startups, diversifying into additional models, acquiring new models, or transitioning from one model to another (Geissdoerfer, Vladimirova and Evans, 2018). The role of BMI in value creation is reflected in the growing recognition of the need for systemic changes in how food businesses operate to address the complex challenges in health and sustainability (Teece, 2010; van Fossen, 2018). This perspective is also reflected in Zickafoose, Lu and Bakers´ (2022) study. The authors highlight that food innovation is no longer limited to product and process innovation alone but that it incorporates broader challenges such as supply-chain efficiency, environmental impact, and consumer-driven expectations.

Despite this diverse innovation landscape, the food industry is characterised by a predominance of incremental innovation, particularly among SMEs. Approximately 80% of food companies employ an “incremental tweaking” approach to innovation (Avermaete *et al.*, 2003; Baregheh *et al.*, 2012; Holman, Devane and Cady, 2017; Tarabella *et al.*, 2019). Incremental innovation involves minor improvements in existing products or services. Bessant and Tidd (2007) describe it as “add-ons” to preceding innovations such as varying ingredients or packaging, as well as enhancing operations. Incremental innovations can be categorised as quasi-new products, which differ from existing products by at least one feature, or me-too products that are a new product only for the company and are frequently used in the food sector (Menrad and Feigl, 2007).

This preference for incremental innovation stems from several factors, including lower risk, faster implementation (Kotler, Keller and Chernev, 2025), reduced financial expenditure (Galizzi and Venturini, 1996), and the ability to capitalise on similarities to existing products (Cooper and Kleinschmidt, 1991). Other factors are the limited

innovative capabilities of SMEs (Cohen and Klepper, 1992) and restricted access to venture capital (Carson *et al.*, 1995; Freel, 2000; Verhees and Meulenberg, 2004).

Radical innovations are rare and have been applied intermittently in the food industry (Bigliardi and Galanakis, 2020a). Radical innovation creates new markets and offers temporary monopoly positions (Tushman and O'Reilly, 1997; Menrad and Feigl, 2007). It involves fundamental changes, such as new products or processes, and is characterised by a high degree of novelty. While radical innovation often requires complex changes, significant financial investment, and carries higher market risk, it is considered an important driver of company growth, success, and wealth (Tellis, Prabhu and Chandy, 2009).

Food SMEs' lower commitment to radical innovation and new technologies may stem from insufficient resource allocation (Baregheh *et al*., 2012). Consumer wariness regarding radically new products and changing consumption patterns, coupled with stringent regulatory requirements, make radical innovations complex, time-consuming, and risky for food companies (Sarkar and Costa, 2008). In contrast, incremental innovations have a lower threshold for consumer acceptance because of improved benefit-cost ratios or utility patterns (Pleschak and Sabisch, 1996).

In conclusion, although the food industry encompasses all types of innovations identified in the general innovation literature, it distinctly preferences incremental product and process innovations and me-too product innovation (Menrad, 2007). This inclination mirrors the industry's mature nature, its conservative approach to innovation and the challenges associated with introducing radical changes in food products and processes. However, emerging trends, especially in sustainability-driven sectors, suggest a potential shift towards more diverse and radical innovation types in the future. Saari et al. (2021) argue that startups in the plant-based protein food sector, for example, are pioneering successful innovations towards health and sustainability with a high degree of novelty. They are driven by increasing consumer demand towards sustainability and health.

Menrad (2007) highlights the distinction between a radical and incremental result of innovation. Both results affect the innovation process itself and the characteristics of innovation development. Thus, identifying the food industry´s commitment to product and process innovation, as well as the predominance of incremental food innovation, it is crucial to understand the processes through which companies in general, and especially food companies in the plant-based protein food sector, develop these innovations.

2.2.4 Innovation process models: A general and food industry perspective

Researchers have applied theoretical models to describe the strategies companies use in their innovation processes. The models for innovation processes have evolved considerably over time and reflect the changing understanding of how innovation takes place in organisations. These models range from early linear approaches to more complex interactive systems (see Figure *2.1*). In the context of the food industry, these models have been adapted and applied in ways that reflect the sector's unique characteristics and challenges.

Early innovation process models were predominantly linear and sequential. The “technology-push” model, prevalent until the 1980s, assumed a straightforward progression from scientific discovery to product development and sales (Meissner and Kotsemir, 2015). It focuses on a scientific breakthrough, referred to as the push idea, which serves as the catalyst for new technological developments. Furthermore, the “technology-push” model emphasises increased R&D efforts as the key to successful new product development (Menrad, 2007; Bigliardi et al., 2020). This model highlights the significance of technological advancement as a precursor to the market demand (Bigliardi *et al*., 2020).

In response to criticisms of the “technology-push” model, the “market-pull” approach emerged. This model positions marketing as the initial stage of the innovation process, emphasising the role of customer demands in driving innovation (Myers and Marquis,

1969; Bigliardi et al., 2020). The “market-pull” model highlights the role of technologies in slowing the growth of new product markets, balancing supply and demand in these markets, and assuming that new products are derived from existing technologies (Meissner and Kotsemir, 2015). However, both of these linear models have been criticised for their simplistic view of the innovation process.

Recognising the limitations of linear models, more complex approaches have been developed. The “coupling model” highlighted the impact of interactions between different company´s departments in the innovation process (Mowery and Rosenberg, 1998). This concept was further expanded by linking companies with both academia and other external organisations in the market, integrating “technology-push” and “market-pull” approaches (Rothwell and Zegveld, 1985). Moreover, the authors challenged whether the stages of the innovation process are also interrelated and interdependent, although stages can be functionally distinct (Rothwell and Zegveld, 1985). Consequently, the process can be logically sequential, although it may not always be continuous (Meissner and Kotsemir, 2015).

Academic discourse has noted the lack of a feedback loop between the different stages or pointed out that external factors beyond the industrial companies are not considered in the model (Dosi, 1982; Senker, 1995; Menrad and Feigl, 2007).

In response to this criticism, Kline and Rosenberg (1986) proposed the “integrated model”. This model conceptualises the innovation process as inherently parallel, with the corporate functions linked to each other by various reversal and reflection cycles (Kline and Rosenberg, 1986; Menrad, 2007). It recognises the complex, non-linear nature of innovation processes.

“Network models” emerged in the 1990s, emphasising the strategic integration of network partners, such as suppliers and customers, in the innovation process (Rothwell, 1992; Menrad, 2007). These models highlight the importance of collaboration, as well as communication and expert systems in driving innovation. These “network models” are characterised by incorporated, parallel, interrelated, and flexible innovation processes. Integrated innovation models emphasise the significant presence of joint

research and development activities and strategic alliances. By this, innovation development has increased its efficiency, leading to more radical innovation along established design avenues (Meissner and Kotsemir, 2015).

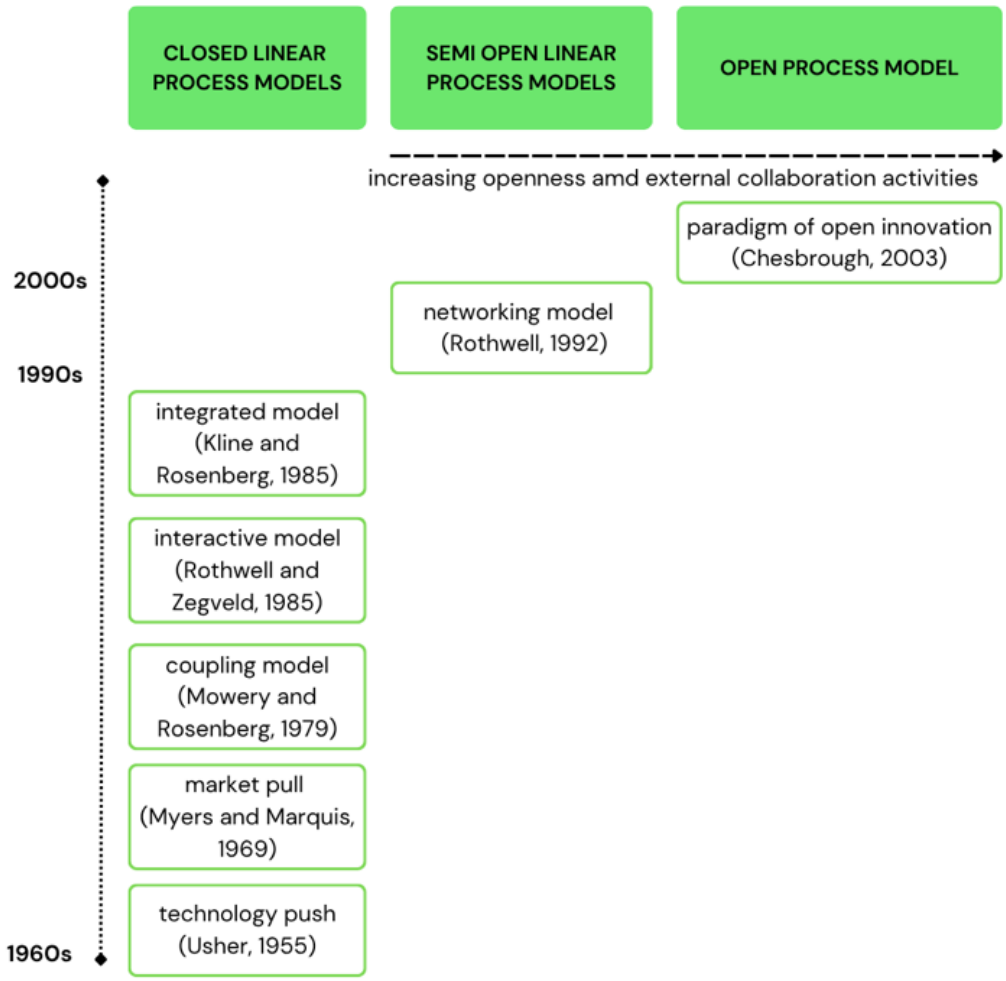

Figure 2.1 Evolution of innovation process models (own illustration adapted from Meissner and Kosemir, 2015)

The most recent paradigm shift in innovation process models comes from Chesbrough (2003). Chesbrough's paradigm is based on the idea that the linear model of innovation is not sufficient to fully explain innovation processes in today's competitive business environment (Bigliardi et al., 2020). The open innovation paradigm underscores the strategic use of incoming and outgoing knowledge to speed-up internal innovation and broaden opportunities for external innovation use. It posits that companies can and

should leverage both external and internal ideas, as well as market channels, to enhance their technological advancements (Chesbrough, Vanhaverbeke and West, 2006).

Figure 2.1 presents the chronological evolution of innovation models from the 1960s to the 2000s. Over the decades, the evolution reveals a transition from closed linear to more open collaborative models. This shift reflects a growing acknowledgement of the important role that external collaboration and open innovation play in fostering technological advancement and market success. The open innovation paradigm and concept of collaboration are discussed in detail in the next section of this literature review.

In the context of the food industry, the application of these innovation process models is distinctive. Despite the evolution of more complex open models, food innovation continues to be predominantly characterised by linear innovation processes. This is largely a result of the significant presence of SMEs in the industry, which often lack resources for more complex innovation approaches (Parida, Sjödin and Reim, 2019). However, there has been a notable shift in the food industry from production-driven (push approach) to market- and consumer-demand-driven (pull approach) innovation processes. This transition highlights the importance of understanding consumer needs at the initial stage of the process, followed by R&D, production, and marketing and sales in subsequent phases, as outlined in Figure *2.2* (Bigliardi and Galati, 2013b).

Figure 2.2 Market- and consumer-demand-driven innovation process (own illustration according to Bigliardi et al., 2020)

The food industry has transitioned from being heavily reliant on technological advancements in the supply industry to adopting a demand-driven innovation approach (Ciliberti, Carraresi and Bröring, 2017). With this shift, innovation has gained vital relevance for companies (Traill and Meulenberg, 2002; Omta and Folstar, 2005), enabling the introduction of numerous new or improved food products to the market,

often alongside process innovation (Bigliardi and Galati, 2013a). The application of networked models of innovation processes, collaboration, and open innovation will be further explored in the Section 2.3 on collaborative food innovation in this chapter.

Although the food industry has been slower to adopt more complex innovation process models, there is a growing recognition of the potential benefits of networked and open innovation approaches (Bigliardi and Galati, 2013a). As outlined in the introduction chapter, collaboration and knowledge exchange with external partners are increasingly seen as crucial for addressing the complex challenges facing the food sector, particularly in areas such as sustainability- and health-driven innovation. These emerging trends in food innovation, which are also relevant in sectors such as plant-based protein food innovation, point to a potential shift towards more collaborative and open innovation processes. This potential transition presents both challenges and opportunities for food companies. In this context, Lurie-Luke (2024) points to the pivotal role of science driven startups in accelerating alternative protein innovation, bridging the gap between academic research, technological process innovation and commercial scalability in open innovation processes.

Furthermore, the background of this study and the definition of innovation suggest that sustainability and health considerations are increasingly shaping innovation processes in the food industry and are becoming key drivers of innovation in the plant-based protein food sector, as discussed in the subsequent section.

2.2.5 Sustainability and health as key drivers of the plant-based protein food sector

2.2.5.1 Holistic perspectives on health and sustainability in context of plant-based diets

Plant-based diets, particularly vegan and flexitarian diets, have become increasingly popular (Saari *et al.* 2021). This shift in dietary pattern has significant implications for sustainability and health.

Health is considered both in terms of individual well-being and nutritional benefits (Leitzmann and Keller, 2020), as well as in a holistic perspective linked to sustainability. Researchers at the German trend research institute “Zukunftsinstitut” (Institute of the Future) posit that health in the context of plant-based diets extends beyond individual human health, encompassing broader networks of effects that influence the health ofboth individuals and entire populations (Zukunftsinstitut, 2022).

The concept of sustainability encompasses the complexity of problems arising from the resource intensity of industrialised nations and the resulting environmental and equity issues within and between generations (Aschemann-Witzel, 2015). According to the United Nations (UN) Brundtland Commission, sustainability is defined as “meeting the needs of the present without compromising the ability of future generations to meet their own needs” (World Commission on Environment and Development (WCED), 1987). The UN's sustainability concept comprises environmental, social, and economic dimensions, all of which are implicated in dietary transitions (Lee *et al.*, 2016).

Researchers of the EAT-Lancet Commission have also adopted this holistic perspective on health and sustainability in their “planetary health diet”, which promotes a flexitarian diet that reduces meat consumption (EAT-Lancet Commission, 2019). They argued that expanding plant-based dietary patterns helps reduce the production and consumption of animal-based foods, thereby contributing to both health and sustainability. Transitioning from current dietary patterns in affluent countries, such as Germany, to healthier options with minimal to no animal products could liberate agricultural land for alternative use (EAT-Lancet Commission, 2019). Furthermore, the dietary patterns

significantly influence the size of the climate footprint. Researchers claim that reducing meat consumption by half could decrease Germany's greenhouse gas emissions from meat production by 32% by 2050, compared to the 2016 levels (WWF Deutschland, 2020).

Moreover, the latest update to the EAT-Lancet Commission´s planetary health diet emphasises socioeconomic, as well as environmental aspects. These socioeconomic aspects include fair pricing, affordability, and equitable access, reflecting a broader systems-based perspective on transforming dietary patterns (Rockström *et al.*, 2025).

2.2.5.2 Innovation for sustainability and health in the food industry

Increasing consumer demand for healthy and sustainable food products is leading to more and more innovations in the food industry to meet this demand. This trend, observed since the mid-first decade of the 2000s, is influenced by several factors, including resource scarcity and customer demand (Damanpour and Schneider, 2009), sustainability as a key innovation driver (Nidumolu, Prahalad and Rangaswami, 2009; Bocken *et al.*, 2014; Geissdoerfer, Bocken and Hultink, 2016; Buhl *et al.*, 2019), technological and economic changes affecting the entire food supply chain (Bigliardi and Galati, 2013a), and growing recognition of the benefits of plant-based diets for sustainability and health (Leitzmann and Keller, 2020).

Recent research reinforces this development. Akhtar *et al.* (2024) frame plant-based protein food innovation as a central lever for a food transformation towards greater sustainability and health, although significant technological constraints remain. Other authors highlight accelerated innovation activity in alternative protein processing and scaling, with notable process innovation, for example in precision fermentation and cell-based production technologies (Kaur, Sagar and Rani, 2025). However, advancements in these areas continue to be limited due to regulatory constraints (Wankhede et al., 2025), as outlined in the context section of this study.

Sustainable business model innovation

Innovation in the food industry extends beyond company success, creating value outside organisational boundaries manifested through innovation for sustainability, which has become an important strategy for organisations to contribute to sustainable development (Breuer and Lüdeke-Freund, 2014; Buhl et al., 2019; Bigliardi et al., 2020). Such innovation encompasses designing products and services, developing processes, and creating new business models for sustainability and health (Nidumolu, Prahalad and Rangaswami, 2009). To effectively implement innovation for sustainability, organisations must integrate sustainability into their core business (Lüdeke-Freund, 2010; Porter, 2011), change their business practices to create positive environmental and societal impacts (Kapadia and Warren, 2022), and adopt business model innovations that consider all aspects of sustainability (Ulvenblad, Ulvenblad and Tell, 2019). The food industry has made significant progress in developing business model innovations that address environmental concerns (Bresciani, 2017). These innovations are determined by both internal factors such as human resources and ecological capacity and by external factors such as collaboration and environmental policy (Bossle et al., 2016).

However, innovating for sustainability presents unique challenges, including defining an adequate innovation scope due to the multidimensional nature of sustainability, considering various stakeholders, and identifying related user needs, as well as sustainability effects (Buhl et al., 2019). To address these challenges, the innovation process, especially in its early stages, requires specialised knowledge and tools, motivation of responsibility, and creative methods such as Design Thinking (Bocken et al., 2014; Buhl et al., 2019).

The following subsection outlines the key insights on innovation and food innovation relevant to this study.

2.2.6 Summary of insights on food innovation for this study

This subsection consolidates the literature from the preceding discussion on innovation and food innovation (Menrad, 2004; Menrad, 2007; Bigliardi and Galati, 2013a). These insights form the theoretical foundation for exploring the innovation process in the plant-based protein food sector.

The discussion highlights the dominance of incremental innovation (Avermaete et al., 2003; Capitanio, Coppola and Pascucci, 2010) and gradual adoption of more open and collaborative innovation models in the food industry (Bigliardi and Galati, 2013b; Ciliberti, Carraresi and Bröring, 2017). Understanding how these models are applied to the plant-based protein food sector will illuminate the specific innovation pathways and challenges faced by companies in this sector.

Moreover, the growing importance of collaboration and open innovation in the food sector underscores the need to explore if and how plant-based protein food companies collaborate with external organisations. This includes examining the degree of openness, types of actors involved, and models of collaboration employed.

While the literature on food innovation provides valuable insights into innovation types and processes, the predominant focus on product and process innovations may overlook other crucial forms of innovation, such as business model innovation and its value for the food industry, especially in the context of sustainability and health (Geissdoerfer, Vladimirova and Evans, 2018; Bigliardi and Galanakis, 2020). Therefore, the plant-based protein food sector is an interesting area for further research in this field.

The next section explores the concepts of open innovation and collaboration in greater depth, further contextualising their role in the innovation processes of plant-based food companies.

2.3 COLLABORATIVE FOOD INNOVATION PROCESSES

2.3.1 Conceptualisation of collaboration

This section elucidates the conceptual understanding of collaboration for innovation as presented in the academic literature, specifically in the context of food innovation and with the purpose of sustainability and health.

The evolution of innovation processes from linear models ("technology-push" and "market-pull") to more integrated and networked approaches, as discussed in Section 2.2.4 and visualised in Figure *2.1*, highlights that collaboration has become a strategic element first with the introduction of networked innovation process models and then more decisively with the paradigm shift to open innovation. The open innovation paradigm introduced a new perspective on external collaboration, emphasising the purposeful integration of knowledge and resources across organisational boundaries to achieve high-value outcomes (Consoli and Elche, 2014; Ollila and Yström, 2017; Bigliardi et al., 2020).

Current debates suggest that open innovation serves as a prerequisite and enabling paradigm for collaboration (Valkokari, Paasi and Rantala, 2012; Bigliardi et al., 2021). This study adopts this view, following the assumption that collaboration involves "combining knowledge, technologies, and other resources across organisational boundaries" (Ollila and Yström´s, 2017, p. 363). The collaborative process is conceptualised through the model of networked innovation which describes the specific configurations and models through which collaboration is structured and operationalised (Valkokari, Paasi and Rantala, 2012; Maurer and Valkenburg, 2014). This relation is illustrated in Figure 2.3.

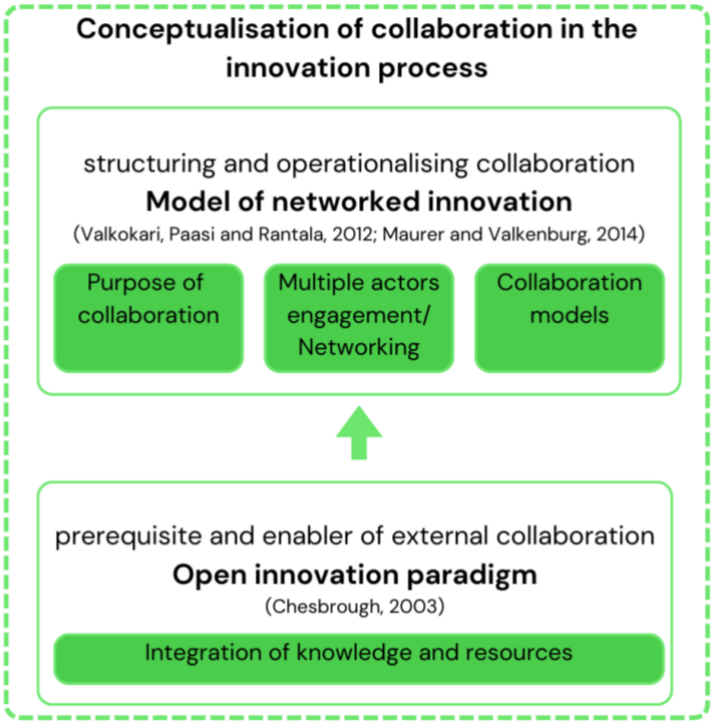

Figure 2.3 Conceptualisation of collaboration (own illustration)

The following section examines the open innovation paradigm, the underlying paradigm for collaboration, in general, as well as its adoption in the food industry.

2.3.2 Open innovation paradigm and its adoption in the food industry

Chesbrough (2003) proposed the open innovation paradigm as a critical assessment of linear innovation process models that are no longer sufficient to explain contemporary innovation activities (Bigliardi *et al.,* 2020). It encourages companies to leverage external ideas and market pathways alongside internal capabilities to enhance technological advancement (Chesbrough, Vanhaverbeke and West, 2006).

Chesbrough (2003, p. xxiv) defines open innovation as “both a set of practices for profiting from innovation, and also a cognitive model for creating, interpreting and researching those practices”. Inbound open innovation involves integrating external knowledge, such as that from suppliers, customers, or research institutions, into internal innovation processes (Bigliardi et al., 2021). Companies´ competitive advantage often stems from this 'inbound open innovation', which involves leveraging the discoveries of

others, implicating not solely relying on companies´ own R&D (Chesbrough, Vanhaverbeke and West, 2006). In contrast, outbound open innovation refers to the external commercialisation of internally developed technologies, for example, through licensing, patenting, or outsourcing R&D (Chesbrough, Vanhaverbeke and West, 2006; Lichtenthaler, 2008). Many companies adopt a combined approach of blending inbound and outbound strategies to maximise innovation outcomes (Leitão, Pereira and de Brito, 2020).

However, when a company adopts an open innovation approach, it may neglect to adequately protect its knowledge, making it susceptible to various risks. Knowledge sharing is one of the principal risks of open innovation, leading some companies consequently to avoid this approach to maintain control over their internal knowledge (Bigliardi et al., 2020).

Although the paradigm of open innovation was initially associated with high-tech sectors, it is increasingly being adopted in more mature and established industries, including the food industry (Bigliardi and Galati, 2013b). Scholars have highlighted its potential to support sustainability and health-related innovation in food systems (Bigliardi and Galanakis, 2020). However, empirical evidence on open innovation practices in the food industry remains limited (Sarkar and Costa, 2008; Lefebvre, Steur and Gellynck, 2015). While some studies suggest that food companies are experimenting with open innovation (Vanhaverbeke and Cloodt, 2006; Thomke and von Hippel, 2002), others argue that institutional openness is still emerging (Procopio Schoen, 2017).

Several benefits of open innovation in the food sector have been identified, including enhanced cooperation and alliances (Ciliberti, Carraresi and Bröring, 2017), stronger collaboration between industry and academia (Traitler, Watzke and Saguy, 2011), and greater user involvement in innovation processes (Costa and Jongen, 2006; Olsen, 2015). These practices can reduce risk, enhance value propositions, accelerate time-to-market, and improve competitiveness (Bellairs, 2010). Bigliardi et al. (2020) also highlight various open innovation models applied in the food industry, such as the ´Sharing is Winning` model (Traitler and Sam Saguy, 2009).

Nonetheless, SMEs in the food industry face challenges in adopting open innovation. These include regulatory complexity, intense competition, and limited internal resources (Saguy and Sirotinskaya, 2014; Sadat and Nasrat, 2020). There are several reasons for this, such as the manner of food production, which involves several actors, and the different and inconsistent requirements that food businesses have to fulfil (Sadat and Nasrat, 2020). As Capitanio, Coppola and Pascucci (2010) note, sectors dominated by SMEs often rely on external sources of innovation because they lack internal capabilities. SMEs are more likely to adopt innovations developed elsewhere than innovate internally.

Depending on its business model, industry characteristics, and technological context, a company can adopt a certain degree of openness (Chesbrough, 2003). This suggests that different sectors and even sub-sectors may exhibit varying levels of openness. Studies highlight tensions between knowledge sharing and knowledge protection in food SMEs (Distanont and Khongmalai, 2020). These companies often adopt a pragmatic, selective approach to openness, balancing potential benefits against competitive risks (Bigliardi et al., 2021). However, this literature has not yet fully conceptualised how such selective openness unfolds in emerging food innovation contexts, such as the plant-based protein food sector.

Companies that embrace open innovation benefit from access to new skills, shared costs, and risks associated with the innovation process and from the reduction of time to market. In addition, these companies foster a creative process that leads to an expanded product range and pursue technological changes more rigorously. Notably, the increase in competitiveness and prolonged duration of competitive advantage are considered the most significant drivers for adopting the open innovation model (Caiazza, Richardson and Audretsch, 2019; Bigliardi et al., 2021). However, not all food companies benefit equally from this. For example, the premium confectionery company Lindt and Sprüngli successfully maintained a closed innovation model based on internal expertise and tacit knowledge, suggesting that traditional approaches may still be effective under certain conditions (Manzini, Lazzarotti and Pellegrini, 2017; Bigliardi *et al*., 2020).

The following section introduces the theoretical model of networked innovation to further conceptualise collaborative processes in the food industry.

2.3.3 Collaborative innovation processes: From general to food industry applications

The model of networked innovation is applied to conceptualise collaboration innovation processes in general and its application in the food industry. Valkokari, Paasi and Rantala (2012, p.28) define network innovation as "a collaboration involving multiple actors but rarely open to all, with a specific purpose for collaboration and its collaboration models cover both knowledge transfer and co-creation activities". This definition highlights three key components of networked innovation which structure this section: (1) collaboration involving multiple actors, typically with restricted access, and (2) a specific purpose encompassing (3) both co-creation activities and knowledge transfer (Maurer and Valkenburg, 2014). These components are further explored in the subsequent sections within the broader context of innovation and specifically in the food industry.

2.3.3.1 Multiple actors' engagement and networking in collaborative innovation processes

Collaborative innovation processes, in the conceptual understanding of networked innovation, are characterised by structured connections among defined groups of actors, with network types and structures varying across different phases of the innovation process (Harryson, Dudkowski and Stern, 2008; Tarabella et al., 2019). Pisano and Verganti (2008) classified networks based on governance (hierarchical or flat) and accessibility (open or closed). SMEs frequently engage in external networking because of their limited internal innovation structures. These networks enable SMEs to remain competitive and innovative in dynamic environments (Van de Vrande et al., 2009; Tarabella et al., 2019). Lee et al. (2010) support this finding by stating that external networks are increasingly recognised by SMEs, especially in the exploration stage of the innovation process.

The development of networks is fundamental to the creation and implementation of innovation, with success often depending on collaboration with other organisations (Valkokari and Helander, 2007; Tarabella et al., 2019a). SMEs face challenges, such as limited resources, a lack of structured processes, and insufficient internal capabilities that can hinder their effectiveness in collaborative settings, even though they are usually flexible and responsive to change (Parida, Westerberg and Frishammar, 2012; Maurer and Valkenburg, 2014). The challenge for SMEs is to use their networks in a proper way and profit from organisations within these networks (West and Gallagher, 2006). Failures in networked innovation are often attributed to intercompany conflicts, lack of scale, infrastructure deficiencies, or external disruptions (Pittaway *et al.*, 2004). Companies that do not engage in knowledge sharing risk limiting their long-term innovation capacity (Pittaway *et al.*, 2004).

Multiple actors' engagement and networking in collaborative food innovation processes

Historically, the food industry has underutilised networking compared to other sectors (Menrad, 2004). This may be due to the sector's focus on vertical collaboration, with actors within the food value chain, which is typical in manufacturing industries (Menrad, 2004, 2007; Sarkar and Costa, 2008; Manzini et al. 2017). Although horizontal collaboration, such as between food companies, has played a minor role, recent studies suggest that both vertical and horizontal relationships influence innovation decisions and outcomes (Sodano, 2019; Bigliardi *et al.*, 2020).

Bigliardi et al. (2020) add that the network of horizontal and vertical relationships in which a food company is included influences the decision to innovate or not and the type of innovation to be implemented. Growing evidence suggests that different types of innovation are associated with distinct sources of knowledge and actor relationships (Tödtling, Lehner and Kaufmann, 2009; Lefebvre, Steur and Gellynck, 2015). Incremental innovations, which are common in the food sector, are often linked to supply chain actors because of their cognitive and cultural proximity (Beckeman and Skjöldebrand, 2007; Lefebvre, Steur and Gellynck, 2015). In contrast, radical innovations are more frequently associated with external actors such as universities and research institutions

(Tödtling, Lehner and Kaufmann, 2009). While some scholars advocate for stronger ties between food SMEs and science-based actors (Traitler, Watzke and Saguy, 2011), others question the effectiveness of policy initiatives aimed at fostering such connections, as the food industry seems to adhere to their value chain relationships (Lefebvre, Steur and Gellynck, 2015).

Nevertheless, there is a gradual shift towards more open innovation approaches in the food industry (Bigliardi and Galati, 2013a), although this is probably lower than that of companies in high-tech sectors (Enkel, Gassmann and Chesbrough, 2009).

Scholars extend collaboration toward broader network and ecosystem perspectives, emphasising multi-actor constellations and value networks that co-create knowledge across organisational boundaries (Ricciotti, 2020). These perspectives recognise that innovation increasingly emerges from distributed relationships rather than linear supply chains, yet they remain underexplored in the context of food innovation (Bresciani, 2017; Krasnokutska et al., 2024). Moreover, authors highlight that the development of plant-based protein innovation, as well as other alternative protein food innovation, increasingly depends on multi-actor collaboration networks connecting startups in this sector, traditional food companies, academia and regulatory authorities (Lurie-Luke, 2024; Kaplan and McClements, 2025).

Trust remains a critical factor in the success of collaborative networks, yet it often continues to be a major barrier to networks and collaboration (Menrad, 2007). Barriers such as scepticism towards new technologies and conflicting interests further complicate collaboration, particularly with suppliers (Bombaywala and Riandita, 2015).

Building trust and fostering transparent, symbiotic relationships are essential, but challenging tasks that require further research (Bombaywala and Riandita, 2015; Antonaras and Dekoulou, 2016). Transparency reinforces mutual trust and loyalty among collaborating companies, reducing transactional costs, and promotes successful partnerships (Kaufmann and Shams, 2016). Reliability and consistency in collaboration are essential and exist only sporadically in the food industry (Menrad, 2007). Moreover,

researchers call for a common vision and trust between universities and the food industry (Krasnokutska *et al.*, 2024).

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In summary, networked innovation offers significant potential to enhance innovation in the food industry, particularly for SMEs (Bigliardi and Galati, 2013a; Ciliberti, Carraresi and Bröring, 2017). While the sector has traditionally relied on vertical collaboration along the food value chain (Menrad, 2004; Sarkar and Costa, 2008), there is increasing recognition of the usefulness of broader and more diverse networks (Lefebvre, Steur and Gellynck, 2015; Bigliardi et al., 2020). The type of innovation pursued, incremental or radical, appears to influence the nature of these relationships, with supply chain actors supporting incremental innovation and external institutions enabling more radical change (Tödtling, Lehner and Kaufmann, 2009; Lefebvre, Steur and Gellynck, 2015). In this regard, Ammirato et al. (2021) call for further exploration of the relationship between networking and different types of innovation. However, trust, transparency, and the alignment of interests remain critical barriers to effective collaboration (Menrad, 2007; Bombaywala and Riandita, 2015).

2.3.3.2 Purpose of collaborative innovation processes

The primary purpose of collaborative innovation processes is to generate and capture economic value, while enhancing innovativeness across the process, market, strategic, and behavioural (Pittaway et al., 2004; Parida, Westerberg and Frishammar, 2012). Antonaras and Dekolou (2016) argued that companies can achieve greater growth, creativity, and innovation by engaging with networks of peer actors and co-creating solutions. Furthermore, in today's increasingly complex and dynamic environment, collaboration is not just beneficial but essential. Internal capabilities alone are often insufficient to meet evolving customer demands (Ricciotti, 2020). Through collaboration, companies gain access to complementary capabilities and resources, strengthen their competitive advantage, and reduce innovation-related risks and costs (Niesten and Jolink, 2020; de Marchi, Molina-Morales and Martínez-Cháfer, 2022).

In the digital age, intangible assets, particularly knowledge, have become central to value creation (Ricciotti, 2020). Knowledge is now widely recognised as the most critical organisational resource and key differentiator in competitive markets. Therefore, the ability to manage and leverage knowledge through collaborative networks is increasingly viewed as a core performance indicator (Giudice and Maggioni, 2014).

Purpose of collaborative innovation processes in the food industry

Collaboration has become particularly important in the food industry´s innovation processes because of the shortening of product life cycles, digitalisation, and shifting consumer preferences. Bigliardi and Galati (2013) argued that these trends necessitate more open and collaborative approaches to accelerate innovation, reduce risk, and maintain competitiveness. The external environment and networks that food companies cultivate beyond their organisational boundaries are crucial to business success (Lefebvre, Steur and Gellynck, 2015; Castellano and Khelladi, 2016).

Deiters and Schiefer (2012) highlighted that interaction and communication, as well as competency development and continuous learning are important perquisites for food innovation. These elements support the view that networking and collaboration are essential for fostering innovation. As food businesses rely on the successful

management of food safety and quality, as well as social and environmental concerns, interaction between food supply chain actors and networking is a basic requirement for successful innovation initiatives. Supporting food SMEs in learning and innovation is closely tied to enabling effective network and collaboration activities, particularly those that facilitate knowledge exchange and capability development (Deiters and Schiefer, 2012).

Vertical collaboration is especially relevant for food SMEs, which often face constraints, such as limited R&D capacity and technological resources. Collaboration with external actors allows these companies to acquire knowledge, reduce project risks, identify trends, and access technological advantages (Weindlmaier, 2001). Moreover, collaboration is increasingly viewed as a means of co-creating shared value and addressing complex sustainability challenges (Breuer and Lüdeke-Freund, 2014; Pittaway et al., 2004), a perspective that remains underexplored in the context of food innovation.

In addition, food companies that adopt a sustainability-oriented approach are more likely to succeed in the long term (Ricciotti, 2020). Therefore, collaboration in food innovation processes is not only a strategic necessity but also a pathway to sustainable development. Section 2.3.4 explores the role of collaboration in advancing sustainability-focused innovation processes.

2.3.3.3 Models of collaborative innovation processes

The model of networked innovation includes two primary collaboration models distinguished by their level of openness and the nature of knowledge interaction: collaboration for knowledge transfer (transactional networks) and collaboration for co-creation. These models specify the theoretical constructs of inbound and outbound knowledge of Chesbrough's open innovation paradigm discussed earlier in this section (Valkokari, Paasi and Rantala, 2012).

Collaboration for knowledge transfer in food innovation processes (transactional networks)

Transactional networking focuses on the development and exploitation of existing knowledge in innovation processes. This typically involves forming connections within a small group of actors to advance a company's strategic or commercial objectives. According to many studies in this field that deal with the inflow of knowledge, transactional networking in the food sector is predominantly linked with the aim of requiring knowledge from external resources (Gassmann, Enkel and Chesbrough, 2010).

Establishing and managing external relationships with customers, suppliers, and institutions are essential for expanding innovation capabilities (Sarkar and Costa, 2008). For example, in the field of cultivated protein foods, close collaboration with regulatory organisations and consumers throughout the innovation process is critical for acceptance by the public and commercial success (Costa and Jongen, 2006;Cloodt and Vanhaverbeke, 2014).

Given that the food industry is often classified as a "low technology" sector, collaboration is particularly important for accessing external technologies and knowledge in innovation processes (Trott and Simms, 2017; Tarabella et al., 2019). Procopio-Schoen (2017) underscores this argument by stating that food companies tend to acquire new knowledge through patented technologies, crowdsourcing, partnerships with external research institutions and service providers, and open innovation communities. In contrast, Gassmann, Enkel and Chesbrough (2010) note that food companies often underutilise the potential to leverage their intellectual property (IP) in new markets, with a few exceptions, such as functional foods. Research institutions also play a key role in disseminating new knowledge and technologies (Ciliberti, Carraresi and Bröring, 2017; Tarabella et al., 2019).

Co-creation in food innovation processes

By contrast, co-creation networks aim to generate new knowledge through collaborative innovation processes. These networks differ from transactional ones in their goals, structure, nature of relationships involved, and challenges faced (Valkokari, Paasi and Rantala, 2012). Co-creation requires regular interaction, open

communication, creative teamwork, and co-innovation, not only within organisations but also between them and their stakeholders (Antonaras and Dekoulou, 2016). The learning process and creation of new knowledge are seen as organisational responses to a changing economic and institutional environment (Giudice and Maggioni, 2014). Transparency is a key enabler of co-creativity and co-innovation (Antonaras and Dekoulou, 2016).

A prominent example of co-creation in food innovation processes is the “Sharing is Winning” (SiW) model introduced by Traitler and Saguy (2009). This model promotes collaboration across all phases of the innovation process with external organisations who contribute their involvement, expertise, and speed while also sharing the risks of innovation. The SiW model involves three levels of partnership: universities and research centres, start-ups and inventors, and key suppliers (Traitler and Saguy, 2009). Its objectives include building trust, fostering mutual respect, and cultivating cooperative relationships (Bigliardi and Galati, 2013). To successfully implement the SiW model, it is important to select appropriate partners, co-create IP, form problem-solving teams, apply best practices, and support cultural and organisational change (Traitler, Watzke and Saguy, 2011).

When food industry companies open their innovation processes, particularly SMEs, they tend to rely more on transactional models because of limited internal resources and a focus on incremental innovation (Trott and Simms, 2017; Tarabella et al., 2019). However, examples such as the “Sharing is Winning” model demonstrate the potential of co-creation leading to increase the degree of innovativeness (Traitler and Saguy, 2009).

2.3.4 Collaborative food innovation processes for sustainability and health

Collaboration is increasingly recognised as essential for food innovation processes determined by sustainability and health. As outlined in the background section, the food industry is facing a significant transformation driven by the need to address health and sustainability challenges. This transformation necessitates innovation processes embedded in the collaborative networks of diverse partners (Hauschildt and Salomo, 2011). From a systemic perspective, Gazdecki, Leszczyński and Zieliński (2021) call for interactive networks and collaboration to approach the challenges associated with sustainable food system.

Open collaborative innovation processes are seen as more effective in fostering systemic change than linear closed models, which are still preferred by the food industry (Augustin *et al.*, 2021). Augustin et al. (2021) further argue that multi-actor collaboration enables the co-creation of solutions capable of delivering rapid and transformative change toward sustainability in food systems.

Innovation for sustainability and health often requires the integration of diverse types of knowledge, which, in turn, necessitates the involvement of external partners (Rauter, Baumgartner and Perl-Vorbach, 2017; Bigliardi et al., 2020). Broad (2020) stated that the further successful transition to plant-based protein sources will be driven by innovation and industry collaboration alongside other enabling factors (Augustin *et al.*, 2021). Kaplan and McClements (2025) deepen this perspective. The authors highlight the emergence of hybrid alternative protein products, indicating complex, cross-sectoral innovation processes that require deeper collaboration between academia, industry and regulatory governance.

Additionally, the European Union's Farm-to-Fork Strategy underscores the role of research and innovation as key drivers in the transformation to a sustainable and healthy food system (Riccaboni et al., 2021). Riccaboni et al. (2021) argue that collaborative actions involving both private and public stakeholders are essential to achieving the integrated innovation approaches envisioned by this strategy. Moreover,

Augustin et al. (2021) emphasise the need for everyone to be involved, including public and private sectors, civil society, and supportive government policies, to create a good environment for innovation focused on sustainability in the food sector.

In addition, specific tools and methods such as design thinking are increasingly important in supporting innovation processes for sustainability and health, particularly in the early stages of the process (Bocken et al., 2014; Buhl et al., 2019) Breuer and Lüdeke-Freund (2014) underline the need for collaboration tools that help maintain a shared normative orientation in sustainability focused innovation processes.

These insights underscore that collaboration is strategically important for addressing complex sustainability and health challenges. The following summary synthesises the key findings of this section and outlines their relevance to the research focus of this study.

2.3.5 Summary of insights on collaborative food innovation processes

The literature highlights that collaborative innovation processes enable food companies, especially SMEs, to overcome internal resource constraints, access diverse knowledge sources, and respond more effectively to evolving consumer demand, as well as sustainability and health requirements (Weindlmaier, 2001; Bigliardi and Galati, 2013a; Ciliberti, Carraresi and Bröring, 2017). Models, such as transactional networks and co-creation, illustrate varying forms of collaboration in an innovation process (Valkokari, Paasi and Rantala, 2012; Traitler and Saguy, 2009). While transactional models focus on knowledge acquisition, co-creation models foster deeper trust-based partnerships that are essential for radical and sustainability-orientated innovation (Antonaras and Dekoulou, 2016; Buhl et al., 2019).

The reviewed literature suggests that the success of such collaborations depends on factors including trust, transparency, shared vision, and knowledge transactions (Menrad, 2007; Bombaywala and Riandita, 2015; Kaufmann and Shams, 2016). Moreover, the literature emphasises potential benefits of collaborative food innovation but often underplays the challenges involved. While collaboration can indeed foster

innovation, the discussed enablers can also cause complexities (Pittaway et al., 2004; Parida, Westerberg and Frishammar, 2012). The assumption that more collaboration always leads to better innovation outcomes may not hold true in all contexts and food sectors, as exemplified in the Lindt & Sprüngli case (Manzini, Lazzarotti and Pellegrini, 2017; Bigliardi et al., 2020). This assumption could be an area for further investigation.

Moreover, it is crucial to consider the capabilities required to manage innovation processes, which are discussed in the following section.

2.4 MANAGEMENT CAPABILITIES FOR FOOD INNOVATION PROCESSES

This section discusses the literature on capabilities to manage food innovation processes effectively, focusing on entrepreneurial capabilities (Antonaras and Dekoulou´s, 2016), knowledge and network management in an intra- and interorganisational context, building on Mendoza-Silva´s (2020) integrated framework. Moreover, the role of transformational leadership in collaborative and innovation-oriented contexts is discussed.

2.4.1 Entrepreneurial capabilities

Entrepreneurial capabilities are crucial for effective innovation processes and introducing new products and services and intertwined with an organisation´s culture, as emphasised by Antonaras and Dekoulou (2016). Entrepreneurship involves proactively seeking innovation and engaging in experimentation (Westhead *et al.*, 2005). The entrepreneurial mindset guides the exploration for opportunities and their development and is characterised by networking, vigilance, high motivation, customer orientation, and a willingness to experiment (Kaufmann and Shams, 2016). Ultimately, innovativeness relates to an organisation's willingness “to depart from existing practices and venture beyond the current state of the art” (Kaufmann et al., 2012, p. 423).

Startups benefit from an entrepreneurial open mindset (Eftekhari and Bogers, 2015), which is essential for maintaining competitiveness (Neneh, 2012) and generating valuable ideas (Thompson, 2004).

An open culture within startup management enhances collaboration, user involvement, and open environment effects on chances of survival (Eftekhari and Bogers, 2015). Even more, a corporate culture that is open to change is a prerequisite for building entrepreneurial capabilities for innovation (Kaufmann *et al.,* 2012). A company´s culture facilitates the acquirement of essential entrepreneurial capabilities, including willingness to change, taking creative solutions, being open-minded, being self-confident and taking risks, as well as seeking for opportunities (Kwong et al., 2012). It fosters internal collaboration founded on mutual trust, knowledge flow, and transparent communication (Kaufmann and Shams, 2016). This aligns with Traitler, Watzke and Saguy (2011) view. The authors call for a paradigm shift in a company´s culture and management towards a co-creation innovation process (see Section 2.3.3.3), with an emphasis on embracing the risk of failure, as well as, clear leadership commitment and vision (including risk taking), and willingness to change and share. Furthermore, the culture is crucial for addressing sustainability challenges through innovative solutions (Gassmann, Enkel and Chesbrough, 2010). Buhl et al. (2019) add the importance of responsibility motivations to address innovation challenges for sustainability, particularly in the early stages of the innovation process.

Moreover, entrepreneurial capabilities are closely linked to human and social capital. Human capital includes employees´ experience, skills, and competencies, while social capital refers to the resources and intangible assets derived from networks and relationships (Antonaras and Dekoulou, 2016).

Both human, as well as social capital are relevant in focusing on the management and effective integration of knowledge; a theme explored in the next subsection.

2.4.2 Knowledge management

Scholars discuss knowledge management in organisation´s internal (intraorganisational) process management and in the context of open and collaborative innovation (interorganisational) processes (Mendoza-Silva, 2020).

Robust knowledge management capabilities are a prerequisite for effective collaboration in innovation processes. Managers must be able to identify and capture external knowledge and determine the best method to integrate it into internal innovation processes (Wallin and Von Krogh, 2010). Moreover, the shift from closed to open innovation processes has transformed how the food industry approaches entrepreneurship (Bayona-Saez et al., 2017). Bigliardi et al. (2020) argue that this transition is shaped by adopting IP frameworks and the strategic role of management in guiding innovation processes. Furthermore, as intangible knowledge becomes increasingly significant, it is crucial to connect human resource strategies with incentives and compensation for innovation (Traitler, Watzke and Saguy, 2011). Furthermore, scholars illustrate that knowledge management capabilities becoming more technologically and integratively demanding. Magdum *et al.* (2026) highlight the increasing importance of technological and digital knowledge integration management capabilities in the context of advances in computational modelling and Artificial Intelligence (AI)-supported formulation in plant-based protein food innovation processes.

Additionally, the ability to build and maintain both internal and external networks is essential in adopting collaborative innovation models and managing collaborative innovation processes (Traitler, Watzke and Saguy, 2011), an aspect further discussed in the next subsection.

2.4.3 Networking capabilities

An organisation's position within a network influences its access to external knowledge. This is crucial for generating innovative ideas that result in new products or services. Participation in relevant networks, whether professional, financial, or industry-specific, grants access to external knowledge and enhances the ability to generate and implement new ideas (Antonaras and Dekoulou, 2016).

Successful innovators possess distinct capabilities in managing cross-company interfaces and networks (Beham *et al.*, 2006). Parida et al. (2016) elaborates on four dimensions of networking capabilities: coordination, relational skills, partner knowledge, and internal communication. According to Traitler, Watzke and Saguy (2011), establishing internal experts and both internal and external networks is of paramount significance (Traitler, Watzke and Saguy, 2011). Additionally, managers must also consider the health and well-being of their network, treating the individual network partners with the same importance as the people within their own organisation (Iansiti and Levien, 2004).

2.4.4 Transformational leadership in collaborative innovation processes

In addition to entrepreneurial, knowledge and networking capabilities, the literature increasingly identifies transformational leadership as an important enabler of collaborative innovation processes. Transformational leaders articulate a vision, foster trust-based relationships, encourage risk-taking, and create an environment that supports experimentation and cross-functional collaboration (Gumusluoğlu and Ilsev, 2009). In the context of open and collaborative food innovation, such leadership behaviours have been shown to facilitate knowledge sharing, psychological safety, and the cultural shift required for co-creation (Traitler, Watzke & Saguy, 2011). Moreover, transformational leadership is linked to sustainability-oriented innovation, as it motivates employees to pursue purpose-driven goals beyond short-term commercial outcomes (Bocken et al., 2014; Buhl et al., 2019).

2.4.5 Summary of key aspects of management capabilities for food innovation processes and implication for this study

The literature review revealed that literature on capabilities to manage innovation processes in the food industry is limited. However, the identified capabilities of entrepreneurial, knowledge and network capabilities provide a foundation for the empirical exploration of this study to specify and enhance them for the management of the innovation process in the plant-based protein food sector (Traitler, Watzke and Saguy, 2011; Antonaras and Dekoulou, 2016; Mendoza-Silva, 2020). Moreover, despite its relevance, the role of transformational leadership in managing collaborative food innovation remains underexplored. This underscores the need for empirical exploration in the plant-based protein food sector.

In addition to these management capabilities, scholars highlight agility as an important organisational characteristic in emerging health- and sustainability driven food innovation contexts. Lurie-Luke (2024) emphasises agility as an attribute that supports iteration, cross-functional collaboration, and responsiveness to consumer demand. These observations are consistent with Conboy and Fitzgerald´s (2004) conceptualisation of agility as constant willingness for change, and with Franco and Landini´s (2022) findings that agility enhances cross-functional engagement and creativity.

Lurie-Luke (2024) further argues that science-driven startups are central actors in the advancement of plant-based protein food innovation due to their high level of agility. This suggests that traditional food industry companies, typically characterised by more rigid organisational structures and slower decision-making processes (Tarabella et al., 2019) may need to strengthen entrepreneurial, networking and knowledge management capabilities in order to collaborate effectively with such startups and integrate emerging technologies into scalable product applications (Kaplan and McClements, 2025). These management capabilities need to be further explored, providing the rationale for the empirical exploration conducted in this study.

2.5 CONCLUDING SUMMARY

This literature review has critically examined the theoretical foundations of innovation, collaboration, and management capabilities in the context of the food industry. It has highlighted the food industry's unique characteristics, such as its reliance on incremental innovation (Menrad, 2004; Bigliardi and Galati, 2013a; Zickafoose, Lu and Baker, 2022), the growing importance of sustainability and health, and the increasing relevance of open and collaborative innovation models (Ciliberti, Carraresi and Bröring, 2017; Bigliardi et al., 2020; Lurie-Luke, 2024).

A key insight that emerges from this review is the tension between traditional innovation practices in the food industry and the transformative potential of sustainability- and health-driven innovation. While the sector has historically favoured incremental, company-internally driven innovation, there is a noticeable shift towards more open, networked, and radical approaches as a response to consumer demand, but also a strategic necessity for addressing sustainability and health challenges (Augustin et al., 2021; Riccaboni et al., 2021; Akhtar *et al.*, 2024; Rockström *et al.*, 2025).

This review also underscores the critical role of collaboration, both vertical and horizontal, in enabling innovation. However, empirical evidence on how food companies, especially SMEs, operationalise open innovation and build effective networks remains limited. Similarly, while the literature identifies various management capabilities as essential for collaborative innovation, there is a lack of clarity on how these capabilities are developed and applied in practice (Procopio-Schoen, 2017; Bigliardi et al., 2021; Kaur, Sagar and Rani, 2025).

These insights directly inform the research focus of this study and justify its contribution. Specifically:

RQ 1 is addressed by exploring how innovation processes unfold in the food industry, focussing on the degree of openness and the influence of sustainability and health considerations.

RQ 2 is informed by the review of collaborative innovation with help of the theoretical model of networked innovation, highlighting the need to understand if and how food

companies engage with actors across the food value chain and broader innovation networks.

RQ 3 is grounded in the scarcity of literature concerning capabilities required to manage food innovation processes, particularly in the plant-based protein food sector.

By adopting a narrative inquiry approach, the aim of this study is to explore and gain an in-depth and contextual understanding of the plant-based protein innovation process in food startups and SMEs in Germany, to map collaboration in the innovation process, and to identify capabilities required for the management of the process.

2.6 ADDRESSING GAPS IN THE LITERATURE

This literature review revealed several areas in which further research is warranted to advance the understanding of innovation and collaboration within the food industry, particularly in the plant-based protein food sector. This study responds directly to certain identified gaps, whilst others require further research (Zickafoose, Lu and Baker, 2022).

This study addresses the limitations of empirical studies on open innovation in the food industry. While some scholars suggest experimentation with open innovation strategies (Chesbrough, Vanhaverbeke and West, 2006), peer-reviewed literature lacks robust empirical support (Sarkar and Costa, 2008; Enzing, 2009; Bigliardi and Galati, 2013). Moreover, existing literature shows a predominance of case studies and surveys (Procopio Schoen, 2017; Bigliardi and Galati, 2013). Although these research designs provide valuable insights, they often lack the depth needed to understand the complex dynamics of collaborative innovation. This study addresses this limitation by employing a narrative inquiry approach that allows for a richer exploration of innovation processes and experiences (Lurie-Luke, 2024; Akhtar *et al.*, 2024).

Despite the growing importance of innovation networks in the food industry, there is a significant gap in our understanding of how these networks are built and maintained, particularly in the emerging plant-based protein food sector (Sarkar and Costa, 2008; Bigliardi et al., 2021). Although studies have examined network structures in traditional

food manufacturing, the unique dynamics of the plant-based protein food sector remain underexplored (Saari *et al.*, 2021). This study responds to this gap by mapping the actors and relationships within the network of plant-based protein food startups and SMEs in the food value chain through narrative interviews. Additionally, longitudinal studies on how innovation networks in this sector form and evolve over time are an area for further research (Maurer and Valkenburg, 2014; Kaur, Sagar and Rani, 2025)

Additionally, this study explores if and how plant-based protein food companies are engaged in collaborative relationships in their innovation processes. In doing so, it addresses the call of several authors who argue that the role of trust and transparency in collaborative relationships remains underexplored. While trust is frequently cited as a critical enabler (Menrad, 2007; Antonaras and Dekoulou, 2016), its development and management in food innovation contexts, particularly in cross-sectoral partnerships, require further investigation (Bombaywala and Riandita, 2015). Furthermore, the integration of sustainability and health into innovation strategies is becoming increasingly important, but not yet well understood (Breuer and Lüdeke-Freund, 2014; Buhl et al., 2019; Augustin et al., 2021; Rockström *et al.*, 2025; Kaplan and McClements, 2025).

By exploring collaborations between emerging plant-based protein food and established animal protein food companies, this study offers insights into cross-sectoral network dynamics (Procopio-Schoen, 2017). This is particularly relevant, given the emerging nature of the plant-based sector and its distinct innovation dynamics (Saari *et al.*, 2021). Further comparative studies across subsectors, could provide insights into how innovation strategies differ based on market maturity, consumer expectations, and regulatory environments.

Moreover, while general management capabilities for innovation have been studied in the food industry, studies are scarce and there is a notable gap in understanding the specific capabilities required for collaborative innovation in the plant-based protein food sector (Beham *et al.*, 2006; Procopio-Schoen, 2017). This gap is particularly significant given the sector's rapid pace of innovation, its sustainability and health focus, and the diverse range of actors involved (Bigliardi *et al.*, 2020; Zickafoose, Lu and Baker,

2022). Key areas requiring further investigation include: the capabilities needed to balance openness and IP protection in fast-moving innovation environments (Galati *et al.*, 2019); skills for managing diverse collaborations between startups, established food companies, and research institutions (Traitler, Watzke and Saguy, 2011); and the specific capabilities required to drive sustainability-focused innovation in collaborative settings (Buhl *et al.*, 2019; Akhtar *et al.*, 2024; Rockström *et al.*, 2025). This study provides insights into most of these areas by exploring the capabilities employed to manage the plant-based protein food innovation process effectively. This study's focus on purely plant-based protein food companies offers a unique perspective on the capabilities required in the sector.

Additionally, the literature review reveals that the role of science-based actors in radical versus incremental innovation should be further differentiated. Lefebvre, Steur and Gellynck (2015) call for research that distinguishes the types of innovation when assessing the contribution of universities and research institutions to food SMEs (Magdum *et al.*, 2026).

Overall, this study contributes to a more nuanced understanding of the ways in which innovation processes, collaboration, and related managerial capabilities unfold in the plant-based protein food sector and provides a conceptual basis for further empirical and theoretical exploration.

2.7 DEVELOPMENT OF THE STUDY´S CONCEPTUAL FRAMEWORK

The conceptual framework developed for this study (see Figure *2.4*) integrates the key concepts explored in the literature: innovation processes and outcomes, collaborative innovation operationalised through the theoretical model of networked innovation, and management capabilities.

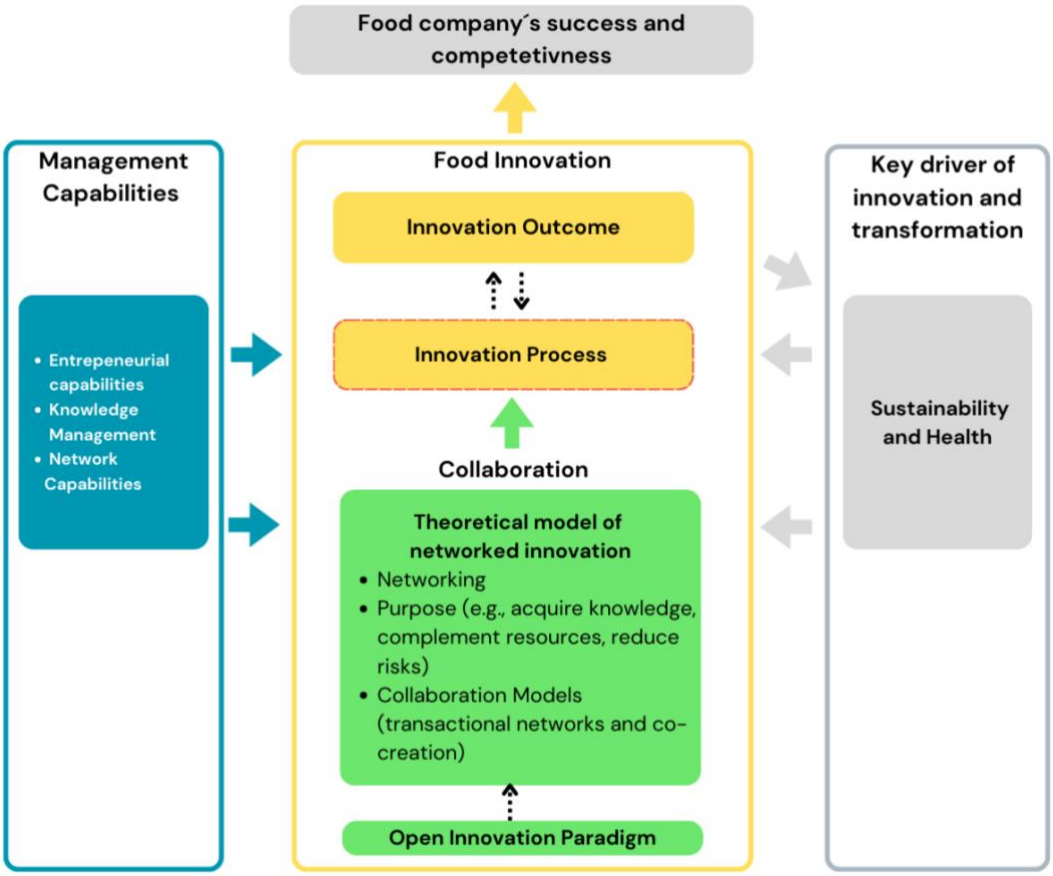


Figure 2.4 Conceptual framework for the exploration of the food innovation process in the plant-based protein food sector derived from the literature review (own illustration)

It reflects the dynamic interplay between these elements and situates them within the broader context of sustainability and health-driven transformation in the food industry.

This framework serves as both a guide for empirical exploration and a lens for interpreting findings contextualised within the plant-based protein food sector.

The following chapter details this study´s research methodology, including the justification for selecting the research strategy of narrative inquiry and narrative methods. Furthermore, it clarifies the researcher's role in a narrative research approach and discusses relevant aspects of research ethics.

3 RESEARCH METHODOLOGY

3.1 INTRODUCTION AND BRIEF REVIEW OF THE STUDY´S PURPOSE

This chapter outlines the methodological approach adopted to address the study´s aim Consequently, this study´s aim, RQs, and rationale are briefly revisited to better evaluate the researcher´s decision regarding the methodological choices.

As established in the introduction, the aim of this study is to explore and gain an in-depth and contextual understanding of the plant-based protein innovation process in food startups and SMEs in Germany, to map collaboration in the innovation process, and to identify capabilities required for the management of the process. To achieve this aim, the study addresses three research questions:

RQ1: What is the innovation process for developing plant-based protein products within food startups and SMEs in Germany?

RQ2: How do plant-based protein food startups and SMEs collaborate with their network in the innovation process?

RQ3: What capabilities are required to manage the innovation process in the plant-based protein food industry?

These questions respond to identified gaps in both theory and practice.

This chapter details the research philosophy, design, methods of data collection and analyses, to address these RQs and fulfil the objectives. Moreover, the researcher´s role in storytelling, the quality of this research, as well as the ethical considerations for this research are discussed.

The next section develops an argument for the philosophical choice of this research.

3.2 RESEARCH PHILOSOPHY

This section outlines the philosophical assumptions underpinning the study and justifies the chosen research philosophy in relation to the study's aim and methodological approach. The discussion is appropriate as this thesis follows the opinion of the pluralist management school. This school values the field's diversity, asserting that it enhances business and management (Knudsen, 2003). It suggests that there is no single correct philosophy to adhere to in business research; it allows for a business research project to select from a wide variety of philosophies. Moreover, Makkonen, Aarikka-Stenroos and Olkkonen (2012) argue that a narrative inquiry, applied in this study, can be underpinned by different philosophical orientations depending on how knowledge is generated to fulfil the research aim.

Business research is grounded in three philosophical dimensions: ontology, which explores the nature of reality; epistemology, which examines the nature of knowledge; and axiology (Ritchie *et al.*, 2013; Saunders, Lewis and Thornhill, 2024)*t al.*, 2013; Saunders, Lewis and Thornhill, 2024). They encompass the researchers` general beliefs and values, as well as their awareness of their own position in relation to and in the construction of knowledge within a specific business context. Saunders, Lewis and Thornhill (2024, p. 124) determine that "the research philosophy you adopt contains important assumptions about the way in which you view the world". The philosophical assumptions span along a continuum between objectivism and subjectivism (Niglas, 2010). Researchers have different perspectives on the continuum of philosophies for business research in their research projects, representing various assumptions.

As established in the introduction, the aim of this study is to explore and gain an in-depth and contextual understanding of the plant-based protein innovation process in food startups and SMEs in Germany, to map collaboration in the innovation process, and to identify capabilities required for the management of the process. The researcher considered the research philosophies of constructivism, moderate constructivism and critical realism as possibly appropriate to fulfil this aim.

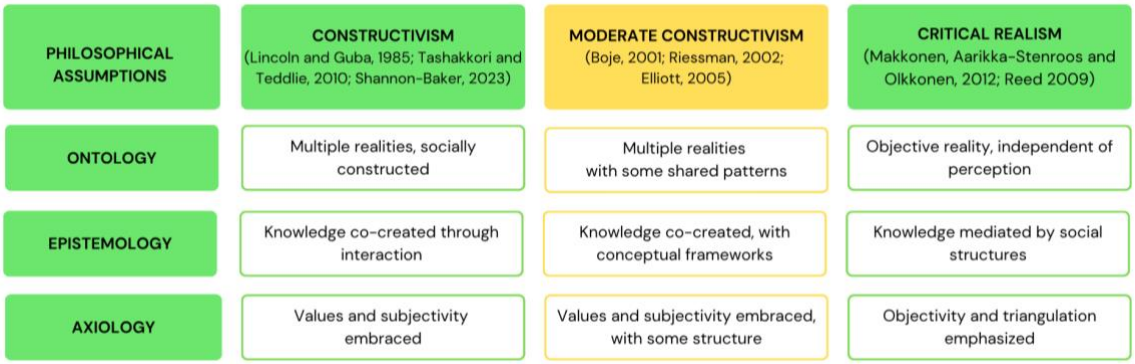


Figure 3.1 Comparative overview of research philosophies considered for this study (own illustration)

Figure 3.1 illustrates the ontological, epistemological, axiological assumptions of these three considered research philosophies, which are further compared and discussed in this section.

From the ontological perspective of this study, the concepts of food innovation process, collaboration and management capabilities explored are constructed "through social interaction in which social actions create partially shared meanings and realities" (Ritchie et al., 2013; Saunders, Lewis and Thornhill, 2024, p. 124). This perspective is reflected in the philosophy of constructivism as well as moderate constructivism (Lincoln and Guba, 1985; Schwandt, 2007; Tashakkori and Teddlie, 2010).

Epistemologically, interview participants´ narratives and the interpretation of the researcher formed the source of knowledge of this study. This co-creation of knowledge through interaction between the researcher and participants is as well reflected in both philosophical stances (Lincoln and Guba, 1985; Schwandt, 2007; Tashakkori and Teddlie, 2010). But in this study, the co-created new knowledge is additionally conceptualised and contextualised through theoretical and methodological models, such as the theoretical model of networked innovation (Valkokari, Paasi and Rantala, 2012) and the dynamic network-process framework (Makkonen, Aarikka-Stenroos and Olkkonen, 2012). This epistemological aspects of knowledge conceptualisation and contextualisation are not covered by the philosophy of constructivism but reflected through the moderate form of the constructivism philosophy which allows to capture

shared patterns or structures across experiences and the use of frameworks for conceptualisation and contextualisation (Boje, 2001; Riessman, 2002; Elliott, 2005).

In terms of axiology, the researcher acknowledges that she was inherently part of the research process and observed this involvement as a beneficial influence on the study (Lincoln and Guba, 1985; Tashakkori and Teddlie, 2010; Shannon-Baker, 2023). Both constructivism and moderate constructivism allow maintaining a subjectivist researcher stance.

However, critical realism has been regarded as a third research philosophy option for this study. Referring to Reed (2009 p. 430), "critical realism focuses on explaining what we see and experience in terms of the underlying structures of reality that shape the observable events". Although the philosophy of critical realism acknowledges the concepts of plurality, complexity, and contextuality (Makkonen, Aarikka-Stenroos and Olkkonen, 2012), it prioritises uncovering external reality, which contrasts with the constructivist emphasis on how reality is experienced and narrated. To fulfil the study's aim of exploring how innovation processes are perceived and enacted by participants, the two constructivist philosophical stances were therefore deemed more suitable.

Another disadvantage of the philosophy of critical realism for this study would be the implied objectivism of the researcher. Whilst researchers in the constructivism philosophy undertake a more subjectivist perspective, researchers in the philosophy of critical realism try to be as objective as possible. As a professional within the food industry, the researcher brought both over 20 years' worth of industry sector knowledge and reflective awareness to this study. She embraced subjectivity as a strength, recognising that her values and experiences shape the interpretation of data and contribute to the richness of the findings (Paltridge and Starfield, 2007).

Finally, the choice of research philosophy was between moderate constructivism and constructivism. Both research philosophies are grounded in subjectivism and reflect socially constructed realities and co-creation of knowledge. Ultimately, the researcher considered moderate constructivism as the most appropriate philosophy for this study,

as the conceptualisation and contextualisation of the co-created new knowledge is central to this study and best supported by this philosophy.

The next section elaborates on an appropriate approach to theory development, as indicated by the choice of research philosophy, followed by a formulation of the research strategy.

3.3 RESEARCH APPROACH

Easterby-Smith, Thorpe and Jackson (2018) emphasise the importance of selecting a suitable approach to theory development, which facilitates informed decisions regarding the suitable choice of strategies and methodological approaches to address constraints. The approach to theory development in a research study is linked to the study´s supporting research philosophy and the research aim. Research in business context could be approached by induction (developing new knowledge) or deduction (testing and refining existing knowledge).

The aim of this study is to explore and gain an in-depth and contextual understanding of the plant-based protein innovation process in food startups and SMEs in Germany, to map collaboration in the innovation process, and to identify capabilities required for the management of the process. This aim implicates an exploratory nature of the research. It implicates to explore data inductively (inductive approach) instead of using data to test theory or hypothesis (deductive approach). However, the literature does not offer a sufficiently developed theoretical foundation to support hypothesis testing in this context. Therefore, the researcher built the research design on an inductive approach to theory development and employed an emerging explorative design by data collection through narrative interviews and a two-step analytic process of intra- (restorying of narratives) and inter-story analyses (synthesis of the plant-based protein food innovation process and construction of a framework of management capabilities).

Moreover, the inductive approach to theory development enabled the researcher to construct the conceptual framework of management capabilities. The framework was constructed out of the narratives and could not have been solely constructed by a

deductive approach, as the literature review did not provide a sufficient basis for robust hypotheses. This resonates with Saunders, Lewis and Thornhill (2024, p.196) view of what an inductive approach constitutes: “If your research starts by collecting data to explore a phenomenon and you generate or build theory (often in the form of a conceptual framework), then you are using an inductive approach”. Furthermore, the inductive approach inherent in the construction and building of theory is consistent with the philosophy of moderate constructivism underlying this study, which considers beliefs of co-creating knowledge and contextualisation.

Additionally, the finally chosen inductive approach to theory, and the philosophy of moderate constructivism are both linked to the subjective perspective and the involvement of the researcher. They are beneficial for this study and rule out a deductive approach to theory which favours an objective researcher´s perspective.

The following section defines the research strategy of this study.

3.4 RESEARCH STRATEGY

In selecting an appropriate research strategy for this study, the researcher considered narrative inquiry and phenomenology as viable strategies to explore the concepts of food innovation process, collaboration and management capabilities indicated in the research aim and reflected in the research questions of this study. Both strategies are inductive and qualitative, focussing on lived experience, but differing in their emphasis and approach.

Through the two-step analysis process of the research, this study equally focuses on researcher´s restoryings of the individual narratives to reflect the individual experiences of interview participants as well as on the synthesis and contextualisation of the narratives in the second analysis step. This two-step approach resonates with a narrative inquiry which focuses on the narratives that individuals talk about their experiences. It values the structure, context, and meaning embedded in personal narratives, recognising that people make sense of their experiences through storytelling (Clandinin and Connelly, 2000; Riessman, 2008, McCall et al., 2019). In contrast, phenomenology

takes the approach of uncovering the core of a shared experience by identifying commonalities across participants' perceptions (Moustakas, 1994; Groenewald, 2004; Giorgi, 2010). Phenomenology focuses on the phenomenon under investigation by describing the core meaning of a phenomenon as experienced by multiple individuals, often through thematic reduction (Chase, 2017), which only supports the second step of analysis of this study.

Moreover, study´s inherent co-construction of knowledge is central to narrative inquiry and a hallmark of moderate constructivism, which supports consistency of research philosophy and strategy. Also, McCall et al. (2019, p. 3) support that narrative inquiry is additionally consistent with the inductive approach of this study by arguing that "(…) narrative information follows inductive reasoning, which often involves a depiction of an individual experience from which an inference to a general or even a collective truth can be made".

Above all, the literature review revealed that existing literature on food innovation shows a predominance of case studies and quantitative surveys (Procopio Schoen, 2017; Bigliardi and Galati, 2013). Although these research designs provide valuable insights, they often lack the depth required to understand the complex dynamics of food innovation and collaboration. This limitation can be addressed through the research strategy of narrative inquiry as well as phenomenology which both aim to gain in-depth insights, whereby narrative inquiry additionally offers the opportunity to contextualise narratives and findings.

Moreover, McCall et al. (2019, p.1) underline the strength of narrative inquiry for in-depth exploration: "The making of stories reveals things to us that we know but didn´t know we knew". Narrative inquiry emphasises for an in-depth exploration of the meanings people assign to their experiences of the phenomena rather than only to explore the phenomenon itself. "Stories and storytelling help us to make sense of our thoughts and experiences, our interactions with the environment and each other, to formulate our beliefs, our identities and values."(McCall et al., 2019, p.1). Participants' narratives allowed the researcher to deeply explore the individually experienced innovation processes of purely plant-based protein food companies. This led to rich

insights into the specific features and determinants of innovation development, enablers and barriers to collaboration, as well as a framework of management capabilities for effective collaboration in the plant-based protein food sector.

In conclusion, the discussion of this section demonstrates that narrative inquiry is the most appropriate research strategy to fulfil the aim of this study and answer its research questions. It aligns with the philosophy, supports the inductive approach to theory development and enables a rich, contextual exploration of the concepts under investigation.

The following section details the data collection methods of this study.

3.5 DATA COLLECTION METHODS

The preceding sections outlined the discussion and choice for the research philosophy, approach to theory and research strategy to fulfil the aim of this study. Figure 3.2 summarises the chosen philosophy, theory approach and research strategy. Moreover, it introduces the qualitative multi-methods of data collection and analysis, which are discussed in this and in the following section.

The inductive, exploratory research design employed in this study necessitates the selection of qualitative methods for data collection and analysis. Qualitative research projects often employ diverse methods (Anderson, Fontinha and Robson, 2020), with the narrative inquiry strategy inherently excluding certain approaches.

The appropriate methods for an exploratory study are characterised by flexibility and adaptiveness. Clandinin (2013, p.33) highlighted a “narrative inquiry as a fluid inquiry, not as a set of procedures or linear steps to be followed”.

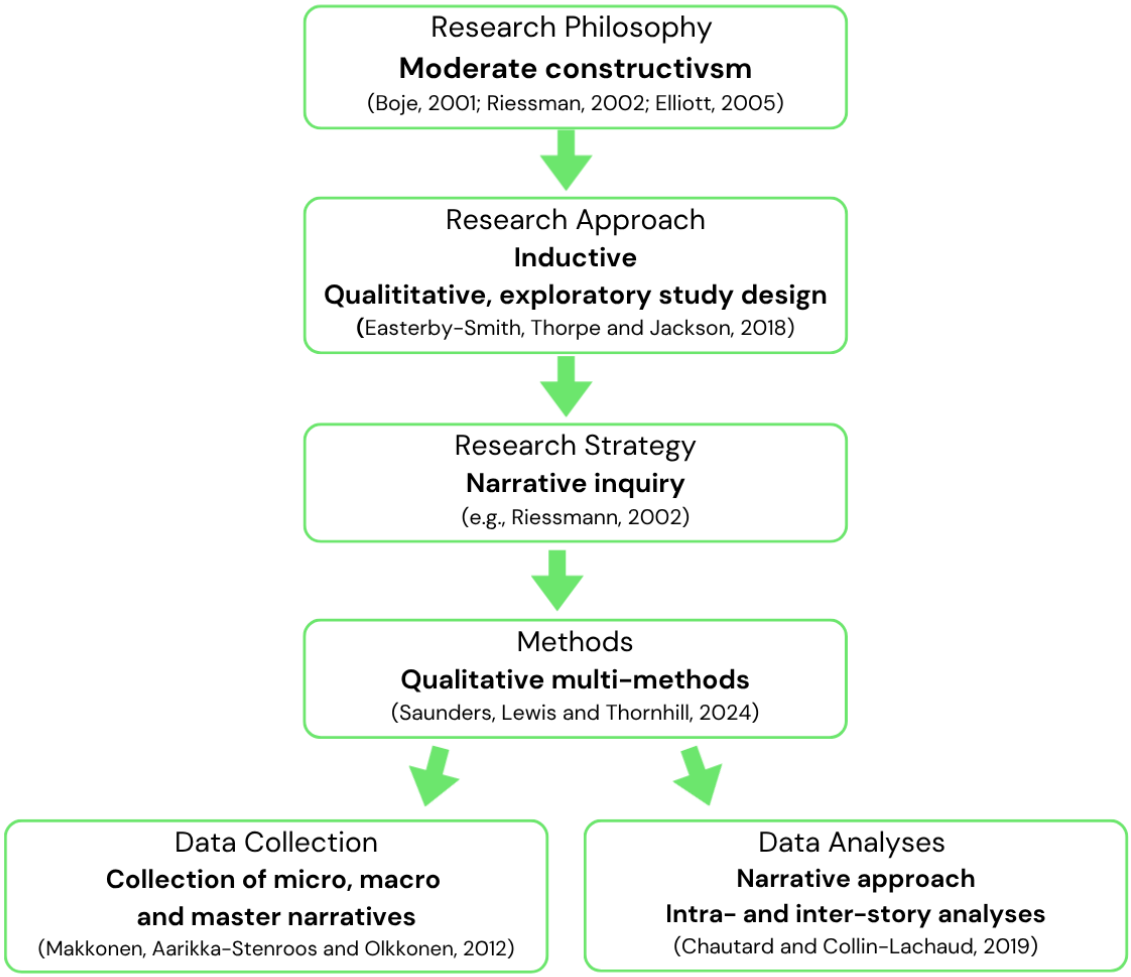


Figure 3.2 Overview of the philosophical underpinning, as well as the qualitative, exploratory research design of this study (own illustration)

Typology of narratives and multi-methods approach to data collection

According to Makkonen, Aarikka-Stenroos, and Olkkonen (2012), this study identifies three types of narratives: micro narratives by informants, macro-narratives (narratives by researchers, communities, or organisations), and master-narratives (narratives by the academic community). These three types of narratives offer insights into focal and contextual events and provide contextual and conceptual understanding of the innovation process in the plant-based protein food sector (see Figure *3.3*).

Moreover, these narrative types inform a multi-methods approach to data collection. Therefore, the researcher of this study considered diverse qualitative data collection

methods during the research design phase (Makkonen, Aarikka-Stenroos, and Olkkonen, 2012). The aim was to identify methods that would best collect these narratives, capture rich, in-depth data, and align with a narrative research strategy.

Discussion of alternative data collection methods and justification

The researcher of this study collected master narratives through the literature review, which informed the conceptualisation of this study. Additionally, the researcher reviewed publicly accessible company documents and conferences/workshop materials, a form of secondary data collection (Saunders, Lewis and Thornhill, 2024), to collect macro narratives and provide contextual understanding of micro narratives. However, as a primary method for micro narratives, document examination was unsuitable because it cannot capture personal perspectives or lived experiences (Clandinin, 2013).

Moreover, the researcher considered semi-structured interviews for collecting micro narratives, as they offer flexibility and allow probing questions, making them a common choice in qualitative research (Saunders, Lewis and Thornhill, 2024). However, they are more question-driven and tend to fragment responses into separate answers rather than elicit holistic, informant-led stories. Narrative inquiry emphasises the co-construction of meaning and the unfolding of lived experiences, which are constrained by the structured nature of semi-structured interviews (Riessman, 2008; Clandinin, 2013). Therefore, the researcher of this study ultimately chose narrative interviews to collect micro narratives. Narrative interviews are fully supported by a narrative research strategy, allowing co-construction and an in-depth exploration of individual experiences in the plant-based protein food innovation process. They reveal insights that go beyond surface-level understanding. Other qualitative methods, such as ethnographic observation, can be supportive, as they provide real-time insights into the innovation process, but do not capture the richness and depth of data that narrative interviews provide (Creswell, 2016). Finally, observation was deemed impractical for an external researcher, such as in this study, due to restricted access and the time-consuming nature of the work.

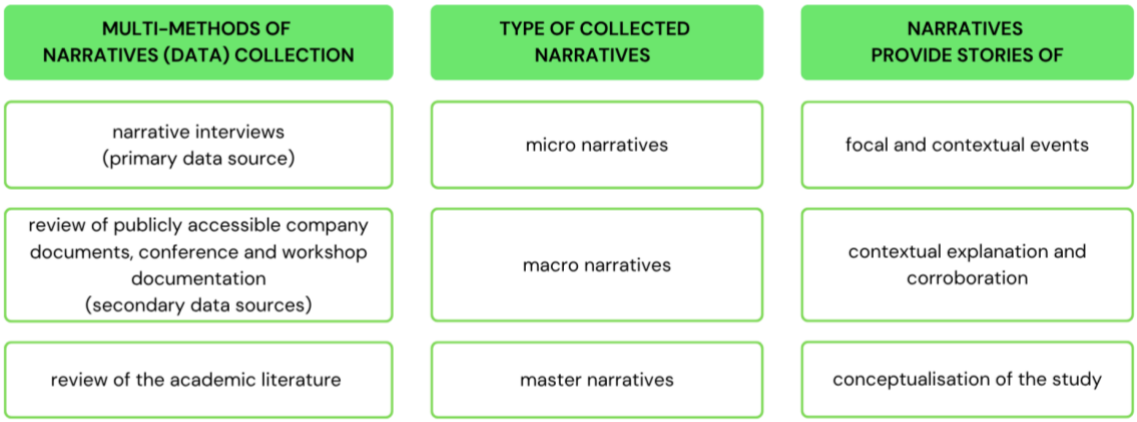


Figure 3.3 Narrative collecting methods, typology of narratives, and data/stories collected (adapted from Makkonen, Aarikka-Stenroos and Olkkonen, 2012)

The next sections detail the data collection methods for this study, which were used to collect micro and macro narratives.

3.5.1 Collection of the micro narratives (narrative interviews)

3.5.1.1 The nature of narrative interviews

The data collection method of narrative interviews is based on Schütze´s (1978) fundamental considerations. The researcher places a strong emphasis on understanding the structure and meaning of narratives as they are told by interview participants. Schütze assumed that narration is the form of representation that, compared to describing or arguing, most corresponds to the cognitive processing of the experience of an individual (Przyborski and Wohlrab-Sahr, 2013). The narratives in this study were provided from the individual perspective of interview participants familiar with the innovation process in their purely plant-based protein food companies. Pentland (1999, p. 712) notes, “an organisation or process cannot tell its story; representatives do that from their own perspective”.

Moreover, narratives more effectively reveal a company's sensitive topics in relation to collaboration and management capabilities than a structured approach with direct questioning. The nature of narrative interviews is deemed effective, being recognised as a humanising method of inquiry that places participants in the role of the narrator. This

role fosters an atmosphere of trust and openness, ultimately leading to deeper insights (Przyborski and Wohlrab-Sahr, 2013)

Generally, narrative interviews are likely to be relatively informal and non-directive. Przyborski and Wohlrab-Sahr (2013) recommend that a narrative interview should follow a certain schedule, encompassing successive phases with specified types of questions, to keep the narration of an interview participant going. The schedule highlights the importance of initially generating the narration by a stimulus question, followed by phases of immanent questions that probe what has already been said, and finally a phase of exmanent questions that introduce the thematic interests of the research (see Figure 3.4).

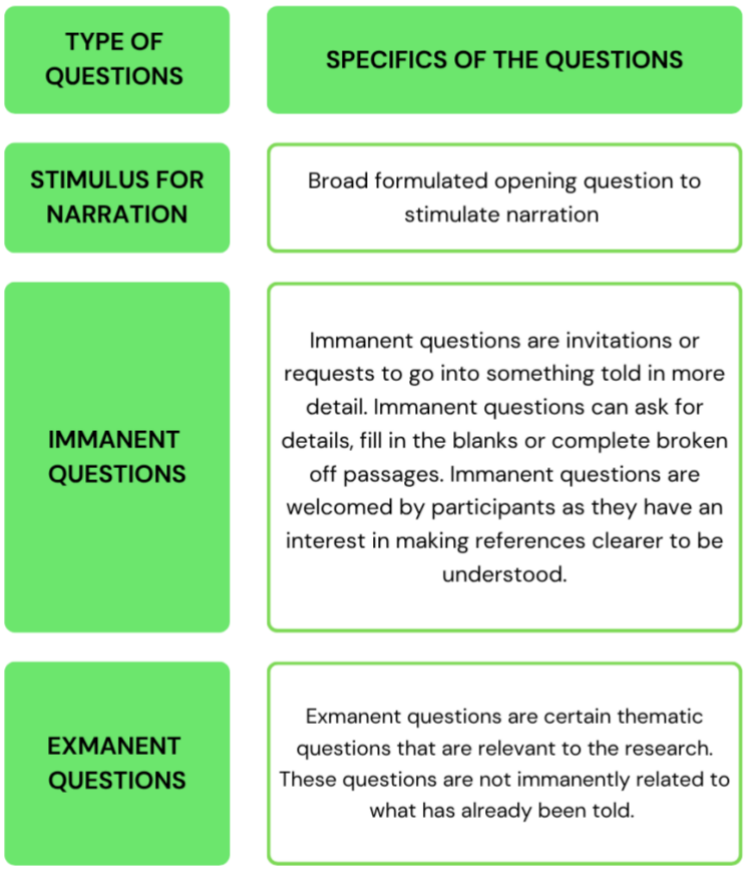


Figure 3.4 Types of questions in a narrative interview adapted from Przyborski and Wohlrab-Sahr (2013) (own illustration)

The next section introduces the participant selection and sampling strategy of this study.

3.5.1.2 Interview participant selection and sampling strategy

The participant selection and sampling strategy was designed to ensure relevance and ethical integrity in accessing probable participants for the interviews within the plant-based protein food sector. To fulfil the aim of this study and to gain in-depth insights into the plant-based protein food innovation process, the non-probability technique of a purposive homogeneous sampling was employed as sampling strategy for this study (Ahmad and Wilkins, 2025). This strategy required the researcher to exercise judgment in carefully selecting participants, further also called narrators, who were particularly well-suited to address the research questions of this study. In line with a narrative strategy, purposive sampling typically involves small but information-rich sample sizes that allow for deep exploration of lived experiences.

The definition of the sampling´s homogeneity was guided by the study´s objectives and the practical availability of participants (Nyimbili and Nyimbili, 2024). The sampling criteria were outlined to represent the ´ideal` participant profile in terms of homogeneity. These criteria ensured that participants had sufficient engagement with the innovation process to provide meaningful narratives. To be qualified for this study, participants had to meet following inclusion criteria:

1. The participant should be familiar with the plant-based protein food innovation process.
2. The participant should be employed at or associated within a company of the plant-based protein food sector in Germany.
3. The participant should be employed at or associated with a company with a purely plant-based protein food assortment.

Qualified interview participants were Senior or C-level managers in purely plant-based protein food companies. Each participant was either familiar with or directly responsible for their company's innovation process. The scope for this research has been set by selecting the German plant-based protein food sector which ensured a regional scope. Only participants of companies with a pure plant-based protein-food assortment were included in this study in order to assure homogeneity of participants. Additionally,

participants were expected to have a genuine interest in contributing to and supporting this research project.

To avoid overlaps of processual innovation approaches, the potential participants who meet the first and second criterion but were employed or associated with a company that markets plant-based protein products next to an animal derived protein food assortment were excluded from this study. Other company key performance indicators, like the annual turnover or the quantity of employees, were not defined as selection criteria.

Further detail on the sampling strategy is discussed in the following sections, including the definition of the sample size, access, as well as participant recruitment strategy.

3.5.1.3 Sample size strategy

The academic discourse reveals that there is no right answer to the question of sample size in qualitative research and overall limited guidance. A key concept in qualitative research is to prioritise detailed investigation over broad coverage. According to Crick (2021, p. 6), "Qualitative research is used to build theories, in which scholars embrace bias by considering human interactions between researchers and their participants". However, the main idea of qualitative research is to understand specific details by studying a small group of people closely (Subedi, 2021)

Moreover, narrative inquiry is associated with small, purposive samples. Saunders (2012) proposes between 4 and 12 participants for a purposive homogenous group. Boddy (2016, p.429) confirms this by stating "in a constructivist or in-depth qualitative research, (already) a single example can be highly instructive". Reviewed studies in related research fields and thesis in the field of food innovation which made use of the narrative strategy, did not indicate an ideal sample size, indeed there was a large variance sample size used.

Therefore, the researcher of this study tried to be pragmatic and refers to the maximum number given by Saunders (2012) to employ a purposive sample of 12 participants. This rather small sample size allowed her to be focused on the in-depth understanding of the

plant-based protein food innovation process and fulfil this study´s aim. Furthermore, a maximum of twelve participants was deemed an appropriate amount in order to analyse the rich and detailed information within a suitable timeframe for this study (Subedi, 2021).

Clandinin´s (2013, p.33) argument that narrative inquiry is a "fluid inquiry" gave the researcher the freedom to add or even remove participants during the research process without having to specify this beforehand (Huber and Whelan, 1999). Moreover, narrative inquiry does not conceptualise saturation as a fixed endpoint; narrative scholars emphasise achieving sufficient depth and richness of stories rather than identifying a point of redundancy (Clandinin and Connelly, 2000; Riessman, 2008). In this study, the researcher recognised that later interviews no longer introduced substantially new narrative insights. At this point, additional interviews largely reinforced patterns that had already emerged, indicating that sufficient depth and variation had been reached for the purposes of this study (Clandinin, 2013).

Probable participants were identified based on the detailed inclusion criteria and approached using a variety of recruitment procedures.

The next section introduces the recruitment and access strategy of this study.

3.5.1.4 Recruitment - sampling (access) strategy

As an external researcher, the researcher needed to gain access to the probable interview participants of the purely plant-based protein food companies. Access means personal (by virtual platforms), as well as cognitive access to intended companies and participants.

Given the researcher's role as a practitioner in the food industry with 20 years of experience she is well connected through food associations, professional and academic networks and events, as well as the virtual business network LinkedIn. Recruitment for the interviews was conducted in a phased manner until the target sample size of 12 participants was achieved. Messages and documents pertaining to the recruitment process are presented in the appendix (see Chapter 10).

The access strategy was underpinned by five key recruitment pathways, each leveraging the researcher´s professional networks while maintaining ethical boundaries:

1. **Direct LinkedIn contacts:** Individuals who met the inclusion criteria. These contacts were only approached under the condition that the researcher did not have any active business or personal relationships with them to avoid any power relations (see Section 10.2)
2. **Contacts of researchers´ direct LinkedIn contacts**: Recommendations from direct contacts were sought to identify additional suitable participants. These individuals were then contacted directly by the researcher following an introduction (see Section 10.3). In the second step the researcher directly contacted them via LinkedIn mail or e-mail (see Section 10.4).
3. **Call for participation via LinkedIn post:** A general invitation to participate was posted on LinkedIn, broadening the reach beyond the researcher's immediate network (see Section 10.5).
4. **Informal business contacts of plant-based protein food companies**: Known industry contacts from trade fairs and events facilitated introductions to potential participants within their organisations, enhancing access while preserving the researcher's external stance (see Section 10.6).
5. **Food innovation networks and associations:** Organisations such as Food Campus Berlin, ProVeg Germany, and BALPRO acted as intermediaries, sharing the research call out and, where applicable, serving as gatekeepers (see Section 10.7 and 10.8).

Access via LinkedIn built the basis of recruitment activities. Around 25 individuals were successively contacted through the first four pathways, and 12 participants were finally recruited. Communication with contacts was ceased if there was no response following a reminder email. The call via food innovation networks and associations was not required at the end.

The final 12 participants are presented in Table 3.1., including their function and the pathway through which they were recruited.

Table 3.1 The sample participants (own presentation)

Interview no.	Randomised participation no.	Participant pseudonym	Function	Recruited
1	13	W	Head of Product Management	directly through LinkedIn
2	37	F	Lead Scientist	directly through LinkedIn
3	21	P	CEO	through informal business contact
4	45	H	CEO/Company Founder	through informal business contact
5	82	A	Managing Director Germany/Austria/Suisse	directly through LinkedIn
6	73	V	Managing Director and Partner	directly through LinkedIn
7	66	T	Head of Marketing	through informal business contact
8	34	Z	Innovation Manager	Directly through LinkedIn
9	98	K	Product Development Manager	through informal business contact
10	70	C	Head of Innovation and Product Management	directly through LinkedIn
11	87	L	CEO/ Company Founder	through informal business contact
12	53	O	Head of Research and Development	through informal business contact

Throughout the recruitment process, the researcher emphasised transparency, competence, and integrity to foster trust and cognitive access. Demonstrating competence and integrity is an advantage for an external researcher. Moreover, participants are more likely to accept a researcher who is objective and who demonstrates integrity (Kakar et al., 2023).

All participants received and returned a signed informed consent form (see Section 10.9) and a comprehensive information sheet (see Section 10.10). Additionally, participants were offered the opportunity to engage in a virtual Questions and Answers (Q&A) session to clarify any concerns. One participant (K) took up this offer.

This study´s researcher did not offer any financial incentives. Instead, participation was framed as a mutually beneficial exchange. The researcher assured that participants receive a summary of the research findings, including insights relevant to their organisations.

This multi-pathways, ethically grounded recruitment approach ensured a robust and contextually appropriate sample, enhancing the credibility and depth of the study's findings.

3.5.1.5 Interview process

The researcher conducted 12 narrative interviews between November 2023 and April 2024 to collect the micro narratives for this study. The interview guideline for these interviews was informed by the schedule and types of questions proposed by Przyborski and Wohlrab-Sahr (2013) and presented in the appendix (see Section 10.1). Scheduled phases of narration and researcher´s follow-up questioning were additionally framed by an introductory phase, which was proposed to generate an atmosphere of trust, as well as a final closing phase (see Section 10.1).

Design and reflective adaptation of the interview guideline

The questions used in the interview guideline were informed by the research questions aimed at collecting in-depth insights in support of this study´s overall aim to explore and gain an in-depth and contextual understanding of the plant-based protein innovation process in food startups and SMEs in Germany, to map collaboration in the innovation process, and to identify capabilities required for the management of the process.

TYPE OF QUESTIONS	EXAMPLES FOR QUESTIONS	INFORMED BY
STIMULUS FOR NARRATION	Could you to tell me how you develop new products in your company and how the process works. What has been your experience with the process? What is particularly important for you? Please take your time to tell your story in detail.	RQ 1
IMMANENT QUESTIONS	**Asking for details:** "You have often emphasized the initial phase of the innovation process. That seems to be important for you. Can you elaborate on that?" **Fill in the blanks:** "You said people involved in the innovation process need to feel responsible. For what exactly do they have to feel responsible?" **Complete broken off passages:** "You said that it was difficult to open up the process in your company. Could you elaborate on why it was so difficult?"	what was narrated by the participants/ questioning technique important
EXMANENT QUESTIONS	"Please tell me about your experience of collaborating with external organisatons in the innovation process." **Possible prompts:** • Please clarify, which organisations do you work with? • Tell me about your experiences, what is important for you when it comes to external collaboration in the innovation process? • For what reasons do you rely on external collaboration? • Could you elaborate on the responsibility for future generations in the context of external collaboration in the innovation process? " In your experience, what capabilities do managers in your company need to collaborate in the innovation process?" **Possible prompts:** • Could you tell me from your experience, which management capabilities manager need to open the innovation process and manage external collaboration?" • Could you describe which capabilities managers need to network and to manage the network?"	RQ 2 and RQ 3 detailed and enriched with themes, determinants from the conceptual framework

Figure 3.5 Questions of the interview guideline used for the collection of the micro narratives (own illustration)

The question to stimulate narration was established on RQ1 in order for participants to share their experiences of their company´s innovation process (see Figure 3.5). This stimulus question encouraged the participant's storytelling without pre-emptively focusing on or assuming the topics of collaboration and management capabilities.

The exmanent questions were directly informed by the second and third research question pertaining to the topics of collaboration (RQ2) and management capabilities (RQ3). These were detailed and enriched through the themes, determinants (e.g. sustainability and health), as well as interrelations conceptualised in this study´s conceptual framework (see Figure *2.4*). The exmanent questions were used if the participants initial narratives did not already include answers to these questions.

Immanent questioning was used only when the need for more detail on a company´s innovation process was required. Immanent questioning depends on the right questioning technique, asking only for further details on what has already been said about the company´s innovation process specifics. Nevertheless, some possible prompts were initially drafted, informed through RQ1 (see Figure 3.5).

Adaptation of the interview guideline through the interview phase

The interview guideline was reflected upon. Questions and prompt techniques developed throughout the interview phase of this study, highlighting the fluid nature of a narrative research approach (Clandinin, 2013). Moreover, due to the individual narratives and participant's subjective perspectives, the interview narration varied from one another. Therefore, the researcher documented the questions that were actually posed in each interview. This process of reflection and adaptation was supported by the collaborative approach and co-construction of stories between the researcher and the participant emphasised by Riessman (2008), as well as through the moderate constructivist philosophical stance and the inductive theory approach of this study.

3.5.1.6 Execution and transcription of the narrative interviews

The researcher conducted the 12 narrative interviews individually via web conferencing using MS-Teams. 10 interviews were conducted in German and two in English. For the German interviews, the researcher translated the initial interview guideline from English into German.

The researcher used the MS-Teams transcripts as the basis for transcription and thoroughly edited and completed them using the audio files of the individual interviews. To become acquainted with the data and take full responsibility for the transcripts, the researcher worked intensively with the audio recordings of the individual interviews. The researcher edited and completed each individual interview transcript herself.

In the intra- and inter-story analysis phases, the researcher translated the quotations from the German interviews into English. These translations were double-checked by a bilingual native speaker (German and English) to ensure their accuracy. It should be noted that some subtle linguistic aspects of the German language might have been lost in translation.

In addition to micro-narratives collected by narrative interviews, macro-narratives were collected for this study, as detailed in the following section.

3.5.2 Collection of the macro narratives (collectively constructed documents)

Macro narratives are collectively constructed documentations about broad phenomena like organisation structure or historical events (Boje, 2001; Elliott, 2005). They are formed by multiple sources and perspectives, often incorporating personal elements. In contrast to micro narratives, which are personal and individual, macro narratives are public and shared. Although macro narratives are non-responsive and not generated directly by research participants, they can still offer valuable external perspectives for the analysis. Collectively constructed documents are stable and verifiable, allowing researchers to revisit and reanalyse them consistently (Zikmund *et al.*, 2013). They are

a powerful tool for constructing macro-level understanding, especially when studying organisations or processes that cannot narrate their own stories (Pentland, 1999).

In this study, macro narratives were collected from publicly accessible company documents, as well as conference and workshop documentation, and internal company documents. These macro narratives were primarily used to create contextualisation of the collected micro narratives and contributed to a deeper understanding of the findings.

Collection of macro narratives through publicly accessible company documents

Documents publicly available from plant-based protein food companies, including information from company websites and articles in business or professional food journals, were used to create valuable preparatory materials for recruitment and interviews. These materials also served as prompts for exmanent questioning and as supplementary data for intra-story analysis. Informed preparation for recruitment and interviews was particularly crucial given the researcher´s external position, it also assisted in establishing trust, credibility, and competence with both participants and companies.

Additionally, one company that was unable to participate in an interview provided a company presentation, sustainability report, and podcast links, which were included in the analysis to enrich the business context.

Collection of macro narratives through conference and workshop documentation for contextualisation and corroboration

In the research phase, the researcher attended five business events in Germany relevant to this study's focus (see Table 3.2). These included conferences, workshops and an interactive masterclass, which offered macro narratives from both professional and academic community, which helped to contextualise and corroborate the findings of the micro narratives. It aligns with narrative inquiry's emphasis on rich contextual understanding and contributes to the credibility of the study's interpretations (Clandinin, 2013).

Table 3.2 Conference and workshop documentation (own illustration)

Event	Description	collected form of macro narratives	used for
A	Interactive workshop with experts from academia and practice on sustainable and healthy food system transformation	Abstracts and summarised workshop outcomes	contextualisation
B	Industry-oriented event accelerating and empowering disruptive innovative protein food technologies	Own notes	contextualisation
C	Conference and trend forum on food innovation at a leading international food trade fair	Own notes and presentations	contextualisation
D	Interactive masterclass on collaboration in the food industry	Own notes and key take aways	corroboration
E	Conference for alternative proteins	Own notes	contextualisation/peer debriefing

Collection of macro narratives through internal company documents

In the closing phase of each interview, interviewees were asked whether they could provide internal documents to support their narratives. Two interviewees shared digital materials: Participant F provided a company and innovation presentation, and participant W a code of conduct document. While the number of internal documents was initially uncertain, the researcher acknowledged their limited availability and restricted analytical value. To maintain anonymity, direct quotations from these documents were avoided.

The next subchapter elucidates the procedures of narrative data analysis within this study.

3.6 NARRATIVE DATA ANALYSIS

The analytical methods adopted in this study are informed by the narrative analyses' procedures proposed by Makkonen, Aarikka-Stenroos and Olkkonen (2012) and Chautard and Collin-Lachaud (2019). These procedures align closely with the research strategy of narrative inquiry, which emphasises meaning-making in personal narratives, temporality, and the co-construction of knowledge. Narrative inquiry, by its nature, does not offer a rigidly defined set of analytical procedures, nor does it provide the level of analytical granularity characteristic of other qualitative methodologies such as Grounded Theory (Saunders, Lewis and Thornhill, 2024). It encourages flexible and context-sensitive strategies that allow narratives to retain their integrity (Clandinin, 2013; Riessman, 2008). Narrative analysis encompasses a diverse range of interpretive strategies. These may include thematic and structural, dialogic or performance analysis, or visual analysis (Riessman, 2008). Other analytical dimensions may involve the exploration of values, narrative structure, meaning, character development, and temporal sequencing (Daiute, 2014).

3.6.1 Justification of the two-phase process of intra- and inter-story analyses

This study utilises a two-phase analysis approach that includes both intra-story and inter-story analyses adapted from Chautard and Collin-Lochaud (2019), which is visualised in Figure 3.6. The researcher chose a combination of intra- and inter-story analyses to respect both the individuality of each participant's lived experiences and the broader patterns across narratives.

The aim of this study is to explore and gain an in-depth and contextual understanding of the plant-based protein innovation process in food startups and SMEs in Germany, to

map collaboration in the innovation process, and to identify capabilities required for the management of the process. To meet this aim, the process and analytical choices were therefore driven by the need to preserve individual meaning-making, the need to identify shared patterns across stories and the need to integrate micro and macro level perspectives. The two-phase structure directly supports these requirements by enabling a layered and contextually grounded data set.

Intra-story analysis (phase 1)

In the intra-story analysis phase, this study´s researcher used a storytelling approach, as well as and to analyse the individual micro and macro narratives addressing RQ1 and RQ2. In the first analytical phase of intra-story analysis, storytelling-based restorying and actor relationship mapping were adopted to best address RQ1 and RQ2 (see Figure 3.6). In particular, storytelling has demonstrated its 'empirical richness` and 'organisational dynamics` in management science (Chautard and Collin-Lachaud, 2019, p.28). Moreover, these methods allow the researcher to access the depth of experience, structural coherence and network embeddedness that reductionist analysis techniques, such as thematic analysis alone, would not permit (Clemens, 2018; Chautard and Collin-Lachaud, 2019).

Inter-story analysis phase (phase 2)

In the inter-story analysis phase, the researcher adopted reflexive thematic analysis to analyse the micro narratives (interviews) and applied storytelling analyses to identify story fragments of the macro narratives (collectively constructed documents), supporting RQ 2 and RQ 3 of this study (see Figure 3.6). Additionally, the researcher used Makkonen, Aarikka and Olkonnen´s (2012) meta-framework for dynamic business network processes to form a synthesised perception of the plant-based protein innovation process incorporating the organisation´s network and business context, addressing RQ 1.

Reflexive thematic analysis in this second analysis phase recognises the iterative and interpretive nature of narrative meaning-making (Braun and Clarke, 2006, 2019), while the integration of macro narratives and the use of the framework ensure that individual

stories are situated within organisational and sector-level contexts (Makkonen, Aarikka and Olkonnen´s, 2012).

The researcher formed a synthesised perception of the individual map of actors and relationships and derived barriers and enablers of collaboration from the thematic analysis to address RQ 2. Moreover, themes were derived with the help of thematic analysis to construct a framework for management capabilities with regards to collaborative innovation in the plant-based protein food sector to address RQ 3.

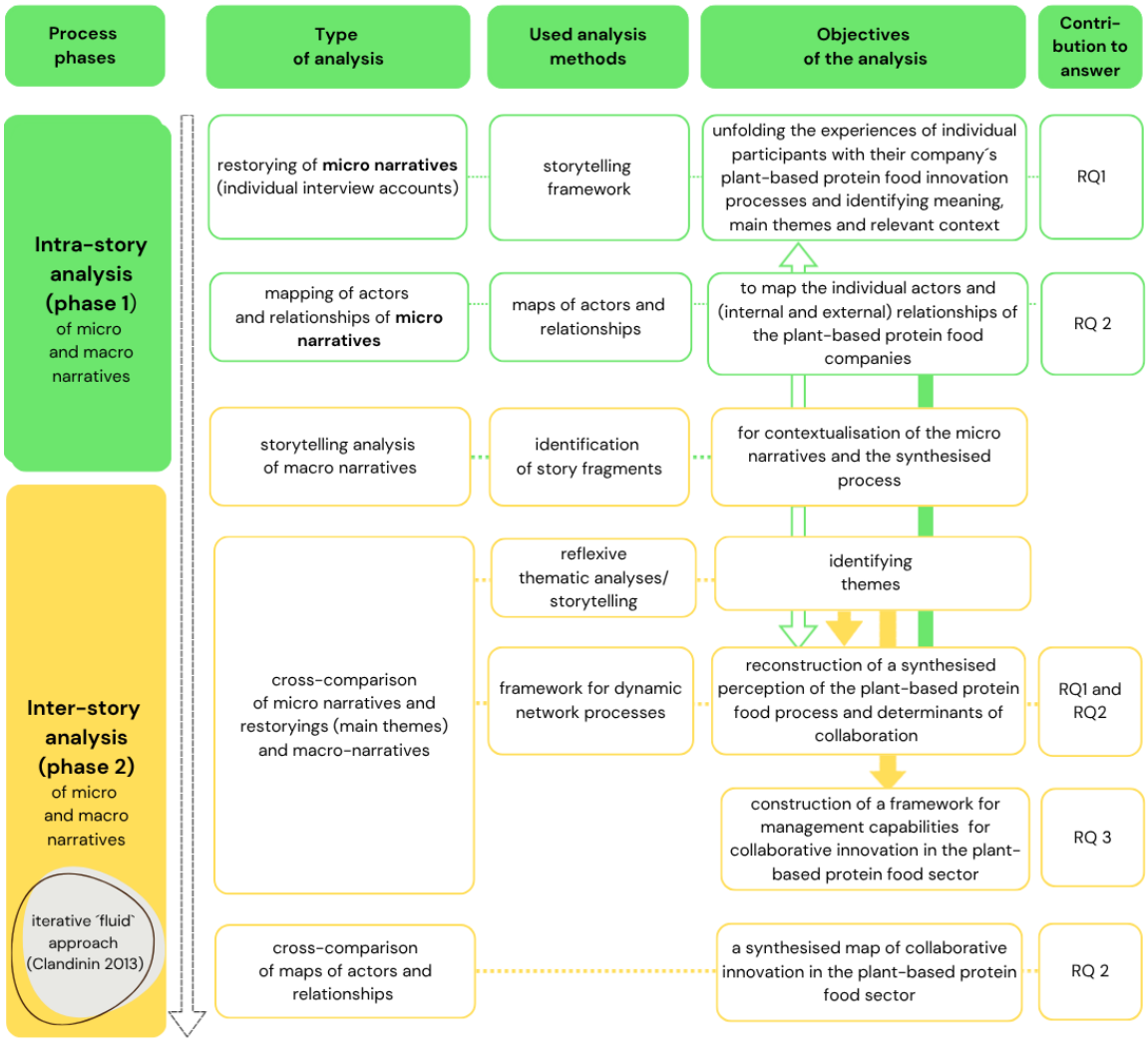


Figure 3.6 Two-phase process of intra- and inter-story analyses and analytical methods adapted from Chautard and Collin-Lachaud (2019) and Makkonen, Aarikka-Stenroos and Olkkonen (2012) (own illustration)

Figure 3.6 illustrates the analytical process of intra- and inter-story analyses. Moreover, the figure summarises the type of analysis, the methods used, the objectives and the respective contributions to answering the research questions. It must be noted, the inherently fluid nature of narrative inquiry (Clandinin, 2013) suggests that the analyses were not conducted in a strictly linear manner but rather in a flowing, iterative mode.

The methods used in the first phase of analysis, storytelling and actors and relationships mapping, are detailed in the following two sections.

3.6.2 Storytelling based restorying of micro narratives

A storytelling approach was applied as the first step of intra-story analysis to restory (Clandinin and Connelly, 2000) the micro narratives of the individual interview accounts.

As supported by narrative inquiry, the individual interview narrative can be compared to "an account of an experience that is told in a sequenced way, indicating a flow of related events that, taken together, are significant for the narrator and which convey meaning for the researcher" (Coffey and Atkinson, 1996). Moreover, the narratives about the companies´ plant-based protein food innovation resemble a sequence of connected events that create a temporal narrative structure, moving from a start to a conclusion (Boje, 2001; Elliott, 2005). By this, participants´ narratives gave the company´s plant-based protein food innovation processes an experienced process character. Essentially, these narratives offer insights into focal and contextual events by employing a storytelling format, which sets them apart from numerical data and straightforward answers to questions (Polkinghorne, 1995).

The researcher of this study applied the storytelling framework developed by Clemens (2018) to guide the narrative intra-story analysis. Clemens´ (2018) storytelling framework was adopted which was highlighted by Singh and Tomar (2023). The authors critically assessed various storytelling approaches and emphasised the Clemens framework as particularly effective for structuring and analysing qualitative data in academic contexts. The two researchers argue that storytelling frameworks enhance the clarity, coherence, and rigour of research narratives, especially in complex or design-

oriented studies. By enabling researchers to "connect the dots" across fragmented data, the framework supports a more holistic and meaningful interpretation of qualitative findings.

The Clemens (2018) framework comprises nine core elements, namely setting, main theme, character, tension, climax, plot, resolution, purpose, and chronology, which collectively provide a comprehensive structure for restorying individual interviews. They serve as an analytical lens through which each micro narrative is examined, ensuring consistency and depth in the interpretation of interview participants' experiences (see Table *3.3*).

Table 3.3 Clemens' nine-elements storytelling framework (own illustration adapted from Clemens, 2018)

Framework Element	Description
Setting	The narrator and organisational context in which the narration unfolds.
Main Theme	The central idea or concept that persists throughout the narrative.
Character	Key actors, whether familiar or new, who feature in the story.
Tension	Conflicts, challenges, or disputes that drive the narrative forward.
Climax	A critical moment of heightened action or decision-making.
Plot	The structural arrangement of events into a coherent sequence.
Resolution	The outcome or clarity achieved following the climax.
Purpose	The underlying rationale or significance of the narrative elements.
Chronology	The logical sequence in which events unfold, often aligned with innovation phases

Term clarification: narrative and story

This study adopts Makkonen, Aarikka and Olkkonens´ (2012) definition of a "narrative" of a structured account (Giddens, 1984) that links events, actors, and contextual as well as other structural components into a unified and meaningful entity. This interpretation builds on Gabriel´s (1998, 2000) conceptualisation of narratives and stories. Narratives are research vehicles not only for delivering facts but also for filling them with emotional and symbolic meaning. In this view, a "story" is a narrative that goes beyond chronological recounting, aligning with (Ricœur, 1990) assertion that a story must organise events into a meaningful whole.

3.6.3 Mapping of actors and relationships in micro narratives

The researcher of this study created individual maps of actors in addition to each restorying of the participants´ micro narratives as a second step of intra-story analysis. These individual maps visualise the analysis of actors and internal and external (if existing) relationships of the individual companies´ protein food innovation processes in response to RQ2 of this study.

3.6.4 Thematic and storytelling analyses

In the inter-story analysis (phase 2), the researcher used a reflexive thematic analysis to inductively derive codes and themes from the micro narratives of the individual interview accounts in an iterative process This method enabled a detailed exploration of patterns in participants lived experience (Braun and Clarke, 2006, 2019). In parallel, storytelling analysis was used to examine the macro narratives, collectively constructed documents, by identifying relevant story fragments and narrative structures (Chautard and Collin-Lachaud, 2019).

Due to the fluid nature of narrative analysis, the researcher did not strictly separate the processes of theme derivation and story fragment identification (Clandinin, 2013). Instead, the macro narratives were used to contextualise the findings of the micro narratives. This approach enables the researcher to position the micro narratives within

a broader context, enhancing the depth and credibility of the study's findings. The macro narratives thus served not only as background context but also as analytical support for interpreting the lived experiences of actors within the plant-based protein innovation process.

The following chapter introduces the meta-framework of network business processes which supported this analysis.

3.6.5 Meta-framework of network business processes

The researcher reconstructed themes and storytelling fragments with the help of Makkonen, Aarikka and Olkonnen´s (2012) meta-framework for dynamic network processes to form a synthesised perception of the plant-based protein innovation process incorporating the organisation´s network and business context. However, this analytical approach is supported by the moderate constructivism philosophy which allows the use of frameworks for contextualisation in co-creating new knowledge, to address the research questions of this study.

Through the meta-framework combined with the storytelling lens, focal, contextual events and actors as well as other structural properties important to the process were synthesised and interpreted. This analytical approach follows the proposal of Makkonen, Aarikka-Stenroos and Olkkonen (2012, p.292) to "consider, conceptualize and employ diverse tactic´s to track, structure conceptualize and/or ´re-narrate` the network process".

The meta-framework of network business processes itself is grounded in Giddens´ (1984) structuration theory. Giddens´ (1984) academic perspective integrates both structural influences and individual agency. It recognises that actors operate within embedded social structures that simultaneously facilitate and limit their actions, institutionalised in enduring relationships (Håkansson and Snehota, 1989) and business networks, which mediate interactions of actors and evolve through them (Anderson, Håkansson and Johanson, 1994; Axelsson and Easton, 2016).

The important terms and relationships in the methodological framework for this study are illustrated in Figure *3.7* and explained as follows:

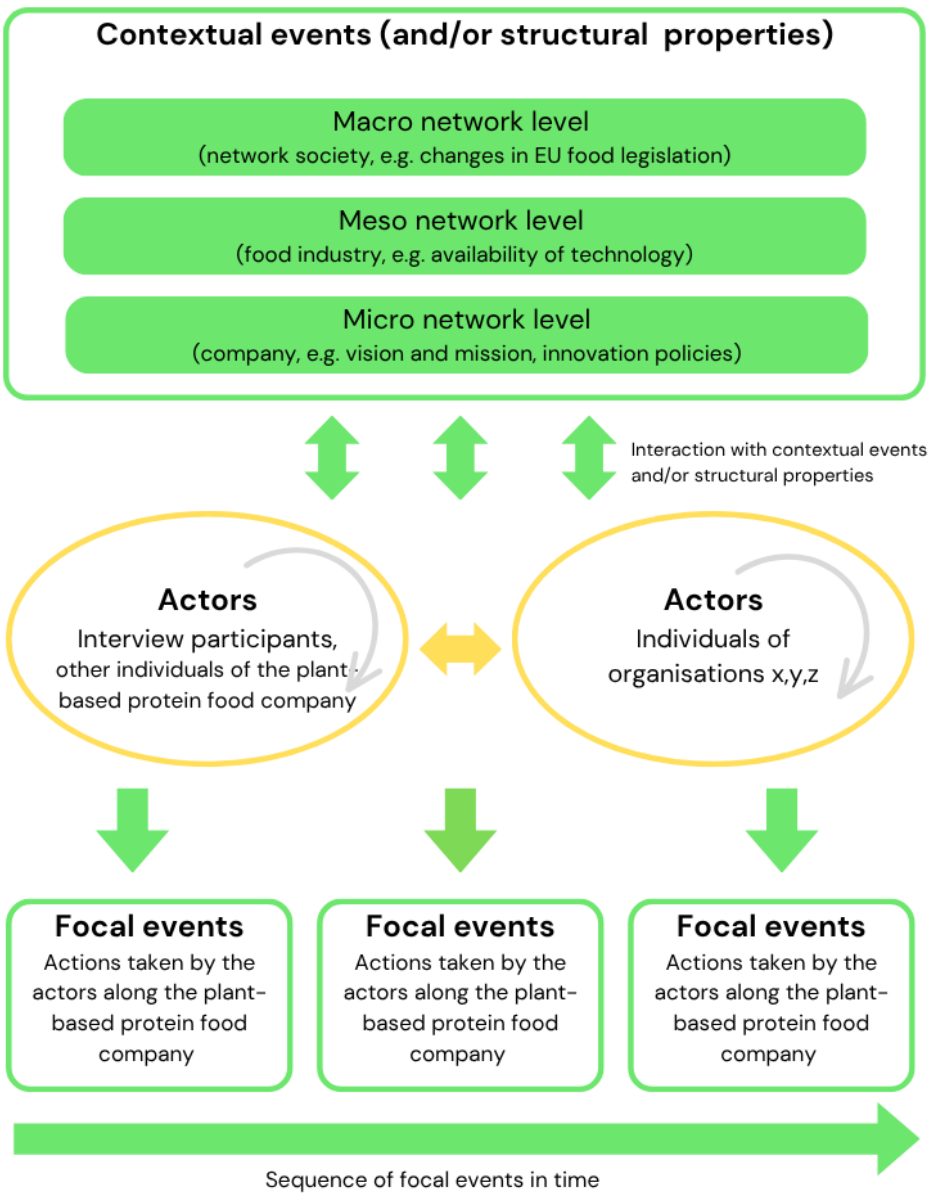


Figure 3.7 Meta-framework of network business processes for synthesis (own illustration adapted from from Makkonen, Aarikka and Olkonnen, 2012)

The concept of an event

The concept of an "event" is understood as the interplay between content and context, encompassing human actions, nonhuman actions, or a combination of both. Events are described as compound constructions of action situated in time and place, shaped by an individual's subjective perspective. Events are not merely objective occurrences but imbued with conscious and unconscious intentions, interpretations and meanings. They reflect both empirical reality and the actor's position.

The event concept is particularly valuable for the purpose of this study as it enables the researcher to capture and interpret key moments within the innovation processes of purely plant-based protein food companies. These events, whether strategic decisions, collaborative interactions, or shifts in direction, were analysed not only for what happened, but also for how they were experienced, understood, and narrated by participants. They thereby align with the study's narrative inquiry approach and philosophy of moderate constructivism.

Focal events

A "focal event" is a particular activity within the network process that plays a central role in the analysis. It emerges from the collective actions of network actors, as they interpret and respond to their context. Focal events represent the core activities under exploration, and are shaped by actors' perceptions, interactions, and shared intentions.

Contextual events

"Contextual events" reflect the broader, dynamic environment in which focal events occur. They include both human and nonhuman actions that influence the focal process, such as organisational innovation policies or structural constraints. Contextual events may also encompass parallel actions undertaken by the same actor, linking the focal process to wider organisational or environmental developments (Czarniawska, 2004). By applying this distinction, the study adopts a multi-level analytical lens, examining Micro level interactions, Meso level organisational dynamics, and Macro level environmental influences to build a comprehensive understanding of the contextualisation and interaction with the network actors in the plant-based protein food process. However, this study´s underlying strategy of narrative inquiry is highly

effective in fostering this contextual understanding, as interactions and context as understood by the individuals are captured through it (Makkonen, Aarikka-Stenroos and Olkkonen, 2012).

The concept of actors

This study adopts the view that agency does not exist in organisations themselves, but in the individuals who act within them (Giddens, 1984). These individuals are named "actors", who engage in the continuous process of perceiving, interpreting, and responding to their structural context. Through their actions, the otherwise abstract structures of the organisation become visible and meaningful. In this study, the interview participants represent such actors, whose narratives reflect how innovation processes are experienced and enacted within the plant-based protein food sector. Importantly, context is not static; it is both shaped by and shaping the actions of these individuals. This duality reinforces the study's moderate constructivist philosophical perspective and supports the use of narrative inquiry to explore how actors co-construct meaning within embedded organisational settings (Gabriel and Griffiths, 2004).

In conclusion, the meta-framework of network business processes provides a clear structure for capturing the complexity of the plant-based protein food innovation process and supports the study´s aim by generating contextually grounded findings.

Narrative inquiry and narrative methods are characterised by a ´fluid` approach which implies iteration, flexibility and adaptiveness in analysis (Clandinin, 2013). This fluidity also affects the role of the researcher as outlined later in this chapter. Moreover, this approach underscores the importance of methodological rigour in ensuring the trustworthiness and credibility of the findings. Therefore, the next section discusses how the quality of this study is ensured.

3.7 ENSURING RESEARCH QUALITY

Guba and Lincoln (1989) and Lincoln, Lynham and Guba (2011) proposed four criteria to assess the quality of qualitative studies: credibility, dependability, transferability, and authenticity. These criteria are conceptually derived from the quality criteria used in quantitative studies.

Ensuring credibility through member checks and peer debriefings

Credibility refers to the truthfulness and believability of the findings from the perspective of the participants. Credibility in this study was achieved through techniques such as member checks and peer debriefings.

"Member checks" of the restoryings of the individual interview accounts with the interview participants were conducted. Participants appreciated reading their stories and validated correctness of the restoryings, as shown by the example quotes in Figure 3.8.

Additionally, a "peer debriefing" was conducted by discussing findings with the researcher´s supervisors, as well as with experts in the plant-based protein food sector during the research phase.

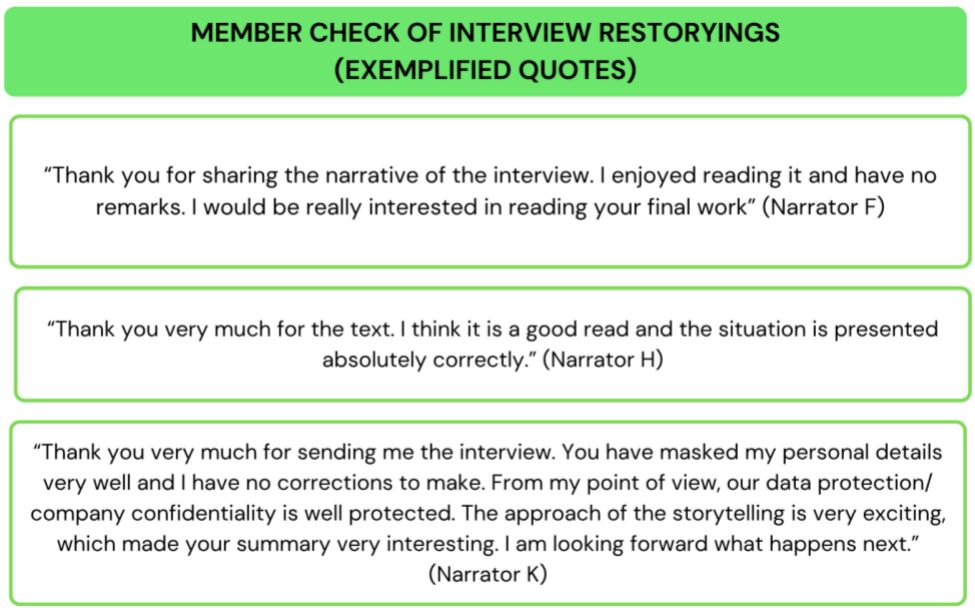


Figure 3.8 Member checks of the interview restoryings (exemplified quotes) (own illustration)

Ensuring credibility through corroboration

Moreover, the researcher of this study used "corroboration across multiple narrative sources" to enhance credibility (see Figure 3.9). This approach aligns with Jonsen and Jehn´s (2009) broader view of triangulation. The authors argue that triangulation is a strategy effective to validate themes in qualitative research, particularly through the inclusion of diverse perspectives and data sources. This study's researcher added narratives from two participants (see Table 3.4) who represent traditional food companies who actively collaborate in the plant-based protein food process to compare and support the micro narrative findings from participants in purely plant-based protein food companies. This brought another perspective to the analysis.

Table 3.4 Interviews with participants of traditional food companies (collaboration-in-action cases) (own illustration)

Interview no.	Randomised participation no.	Participant pseudonym	Function	Recruited
13	17	D	Marketing Director	through recommendations from direct LinkedIn contacts
14	93	N	Head of Consumer Insights & Market Research	through recommendations from direct LinkedIn contacts

Additionally, macro narratives, such as those derived from an interactive masterclass on collaboration in the food industry, were used for corroboration (see Table 3.2), were used to contextualise and reinforce the findings. These included conferences, workshops and an interactive masterclass, which offered macro narratives from both professional and academic community, which helped to contextualise and corroborate the findings of the micro narratives. It aligns with narrative inquiry's emphasis on rich contextual understanding and contributes to the credibility of the study's interpretations (Clandinin, 2013).

Furthermore, the consistent use of narrative interview guidelines for the interviews with the representatives from the two medium-sized traditional food companies, as well as for the interviews with the participants of the purely plant-based protein food companies ensured methodological consistency and dependability.

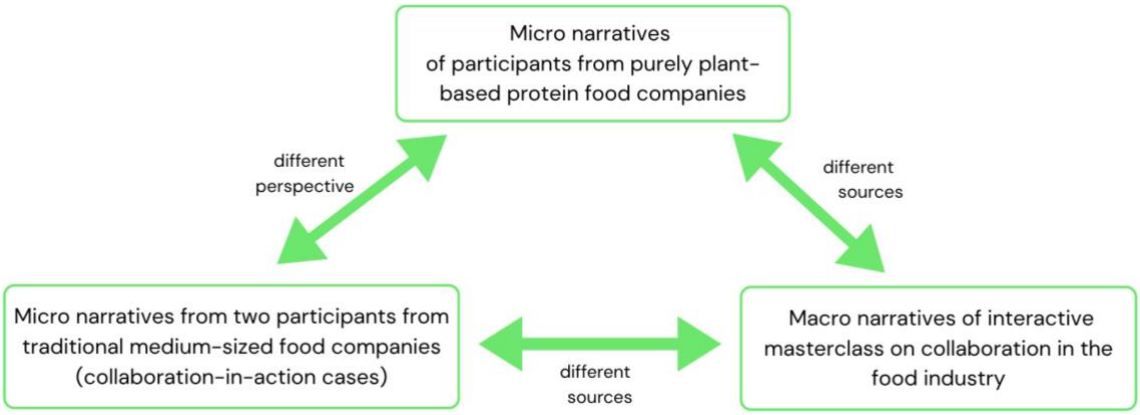


Figure 3.9 Enhancing credibility through corroboration across multiple narrative sources (own illustration)

Ensuring dependability by continuous documentation

Dependability addresses the stability and consistency of the research process over time. It is similar to reliability in quantitative research. During the research phase the researcher recorded all changes of this study´s progress through comprehensive documentation, namely by storing all document versions of the evolving study, conducting a research journal and taking continuous notes. This procedure assured a reliable account of the research process and methodological decisions that could be understood and evaluated by others.

The narrative interviews were conducted in a dialogical manner with a collaborative approach which helped to ensure the readiness and reflexivity of the participants. This allowed for a more open discussion where preconceived ideas and beliefs of the researcher were evaluated. The reflexive engagement by the participants facilitated an exploration of how meanings are socially constructed.

Ensuring transferability by detailed descriptions

Transferability indicates the degree to which findings can be applied to other contexts or settings. The researcher of this study ensured that the researcher´s storytelling and interpretation match what participants meant to say, by sharing the restoryings of their narratives with them. Moreover, the researcher´s detailed description of the research design and methods in this chapter can help other researchers to assess the transferability of this study to other research settings.

Ensuring authenticity

Authenticity emphasises the fair and balanced representation of participants' voices, including the diversity and complexity of their perspectives. It also considers whether the research process empowers participants and encourages an in-depth understanding of the phenomenon under study.

The researcher of this study promoted fairness by ensuring that participants´ views were accurately represented. Furthermore, the researcher has been sensitive to the participants´ story-ownership, particularly taking care in the restorying process to preserve the integrity of individual narratives. Furthermore, the researcher involved the participants by sharing the researchers' restoryings in the analysis process (see Figure 3.8). In addition, the researcher ensured that her preconceived expectations did not mask the meanings and experiences expressed by the participants through regular recordings and reviews during the analysis phases.

The next section details the ethical considerations undertaken for this study.

3.8 ETHICAL CONSIDERATIONS

Building on the principles of research quality, this section outlines the ethical considerations that guided this study. Ethical behaviour in research demands ongoing attention and thoughtful consideration (Iphofen, 2011). Bulmer (1992) outlines ethics as a principal sensitivity to the rights and well-being of others. Moreover, research ethics relates to the appropriateness of the researcher's actions in relation to participants and those potentially affected by the study (Gray, 2004). Iphofen (2011) further emphasises

that ethical practice in social research involves not only being a competent researcher but also a morally responsible individual. This highlights the challenge of separating personal values from professional ethical standards, as both are deeply interconnected. Moreover, the researcher is responsible for understanding and considering ethical principles in the context of their individual research project, as well as the methodological approaches they have chosen to answer the research questions. Both methodological and ethical principles are intertwined.

This researcher conducted the study recognising the accepted methodological and ethical standards, as confirmed by the University's ethical approval. This research complies with the University of Worcester's Policy for the Effective Management of Research Data, as well as the General Data Protection Regulation (GDPR). The GDPR is an extensive data protection law that is enforced across the European Union (EU), including in Germany.

This study´s researcher thoroughly considered ethical issues relating to research design, recruitment, data collection, anonymity, confidentiality and the presentation of participants in the study report.

The section on the collection of micro narratives already outlines ethical considerations concerning interview participant recruitment. Moreover, the researcher ensured that the participants were made aware of the fact that they could withdraw verbally and in writing from this study. To prevent power relationships, narratives were collected from participants who gave their data freely, had not been encouraged or displayed any other kind of dependability.

Confidentiality and pseudonymisation

The researcher of this study recognised that narratives of the company's individual innovation processes, collaboration practices, and innovation capabilities, could contain relevant issues regarding business competition. To protect participants and their organisations, confidentiality and pseudonymisation procedures were implemented.

During the initial recruitment and interview scheduling phase, participants were known by name and identifiable to the researcher. After the initial phase, all participants were

assigned randomised participation numbers and pseudonyms (e.g., Narrator K). Pseudonyms were consistently used in the restoryings and quoted material. Participants received the randomised participant number with the informed consent document and knew their pseudonym when reviewing their restoryings.

While the researcher retained a secure record linking pseudonyms to participant identities for the purpose of member checking, all identifying information, including names of individuals, companies, and third parties, was removed or altered during transcription. Documents provided by participants (e.g., internal reports or presentations) and data sources and documentation of other macro narratives. In the research phase, the researcher attended five business events in Germany relevant to this study's focus (see Table 3.2). These included conferences, workshops and an interactive masterclass, which offered macro narratives from both professional and academic community, which helped to contextualise and corroborate the findings of the micro narratives. Furthermore, this study applied pseudonymisation procedures not only to interview participants but also to these macro narrative sources. As these events were not fully public and identifiable contributions took place in partially unrecorded settings, the researcher of this study pseudonymised names of the events and organisations. The researcher took this approach to ensure that no individual or company could be indirectly identified through contextual details. It aligns with narrative inquiry's emphasis on rich contextual understanding and contributes to the credibility of the study's interpretations (Clandinin, 2013). Table 3.2 was also pseudonymised to prevent identification. These materials and notes are not included in this thesis appendix to further protect confidentiality.

Moreover, the researcher ensured that no participant or organisation can be identified in the final thesis or any future publications. Interview transcriptions in Word format are not included in the appendix. Informed consent was obtained from all participants (see appendix, Section 10.9), with clear explanations of the research objectives, data handling procedures, use of narratives, and the measures taken to protect their identities and data. Moreover, ethical protocols were followed throughout the study, including such as the use of adapted gatekeeper request texts.

Data protection, storage, and disposal plans

All electronic data was transferred to the researcher's University of Worcester managed OneDrive, which is encrypted and securely stored. In line with the University of Worcester's Policy for the Effective Management of Research Data and the study´s ethical approval, a data retention protocol was established for the period following the study´s completion.

This study employed pseudonymisation procedures to protect participant identities. All identifying information were replaced with pseudonyms, and a secure record linking pseudonyms to participant identities was retained solely for member checking purposes. No identifiable information will appear in the thesis or any future publications.

Pseudonymised transcripts and related data will be retained for ten years after publication to support further academic dissemination. Audio recordings were deleted after transcription and analysis; handwritten notes were shredded. All data handling complies with GDPR and the University's data protection and information security policies.

The researcher of this study employed diverse strategies such as corroboration, transparent documentation of analytical decisions, and reflexive engagement throughout the research process to support rigour and ensure the quality of this research. These practices helped ensure that interpretations remained grounded in participants´ lived experiences while maintaining ethical responsibility in representing their stories. Moreover, this study´s researcher received advice and guidance from her supervisory team throughout the research process.

Ensuring ethical integrity and methodological rigour in narrative research also requires recognising the researcher's influence on the research process. Which is outlined in the following section.

3.9 RESEARCHER´S ROLE IN NARRATIVE RESEARCH

This study recognises the researcher as a central instrument in the narrative inquiry process. The researcher is an active instrument in a narrative research process. This role involves shaping the research design, co-constructing meaning with participants, and interpreting stories through a reflexive approach. In this study, the researcher's role was deeply interwoven with her identity as a practitioner in the food industry sector, which brought both insider insights and methodological responsibilities.

The researcher as instrument in narrative research

Narrative research acknowledges that the researcher's presence, personality and positionality influence the stories that are told and how they are interpreted (Clandinin and Connelly, 2000; Riessman, 2008). As an external researcher entering the world of plant-based protein food companies, this study´s researcher had to gain access and build trust with participants who were unfamiliar with her or the academic context of the study. The researcher of this study provided clear and transparent information about the research aims, methods, and ethical guidelines to establish credibility. Her professional background helped her to emphasise with the participants' experiences. Moreover, she remained mindful of the need to balance empathy with analytical distance.

Reflexivity and researcher identity

The researcher's two identities, as a practitioner with industry experience and a qualitative researcher, shaped how she approached this study. This duality of roles allowed her to understand the language, challenges, and values of participants, but also required ongoing reflexivity to avoid projecting her own assumptions onto participants' narratives. Reflexivity was maintained through several key practices. The researcher of this study kept a detailed journal to document thoughts and evolving interpretations throughout the study. She actively reflected on moments of insider bias, particularly when participants' stories resonated with her own professional experiences. Additionally, she remained acutely aware of power dynamics during interviews and

made concerted efforts to create a safe space where participants felt comfortable sharing their narratives openly.

As Hamilton, Dunnett and Downey (2012) suggest, researchers often undergo transformations during the research process. The researcher of this study experienced a sense of being in-between, simultaneously connected to and detached from her research. This dual state created moments of transition and ambiguity, where the researcher felt both intimately involved with her research and yet somehow distanced from it. Moreover, self-acknowledgement of being an active part of the research enriched her understanding but also demanded critical self-awareness (Le Gallais, 2008).

Researcher´s reflective engagement with ethical concerns

Narrative research involves ethical challenges, particularly around representation and interpretation of participants' stories which implies a reflective position of the researcher (Alvesson and Sköldberg, 2009). Narratives are inherently selective and shaped by the context in which they are told (Roberts and Sims, 2017). Participants may, consciously or unconsciously, present themselves in a favourable light and the researcher had to be cautious not to overinterpret or misrepresent their intentions (Gabriel, 2000; Reissner, 2008). The measures taken to address ethical concerns in this study have been outlined in the previous section. In addition, the researcher of this study engaged with participants' narratives with openness, while maintaining a critical lens, a role which Gabriel and Griffiths (2004, p. 124) describe as that of a "travel companion" in the narrative research process.

3.10 SUMMARY

This chapter delineated and justified the methodological choices underpinning this study. Their consistency with the study´s research aim was demonstrated. The aim of this study is to explore and gain an in-depth and contextual understanding of the plant-based protein innovation process in food startups and SMEs in Germany, to map collaboration in the innovation process, and to identify capabilities required for the management of th process.

This study adopted a moderate constructivism philosophy, enabling the researcher to explore how innovation processes, collaboration and management capabilities are constructed, experienced and interpreted by actors in the plant-based protein food sector. This philosophical stance also supported the use of frameworks in the co-construction of new knowledge. The meta-framework of dynamic network processes, adapted from Makkonen, Aarikka and Olkonnen (2012), provided a structured and flexible lens to synthesise yet contextualise the plant-based protein food innovation process.

This ontological and epistemological position supported the use of narrative inquiry as the research strategy for this study, which is particularly suited to capturing the experiences and meaning of actors involved in innovation processes. An inductive approach to theory development was employed to enable the emergence of new conceptual insights grounded in the collected narratives, aligning with the exploratory nature of the study.

The researcher of this study collected data through narrative interviews (micro narratives) and documentary sources (macro narratives), allowing for corroboration and contextualisation. The two-phase analysis process, comprising intra- and inter-story analyses, facilitated two outcomes. Firstly, it enabled restorying of individual interview accounts (micro narratives) based on storytelling. Secondly, it synthesised and contextualised these micro narratives alongside the macro narratives (events and workshop documentation) through thematic and storytelling analyses. This was supported by the meta-framework of business network processes. In conclusion, the

methodological design of this study is well aligned with its exploratory aim and provides a strong foundation for the analysis.

The subsequent chapters are structured to reflect the two-phase analysis process of this study, beginning with the findings of the intra-story analysis (phase 1), followed by the findings of the inter-story analysis (phase 2), and concluding with a critical discussion of findings. Figure 3.10 illustrates the structure and sequence of these chapters, guided by the analytical progression of this study.

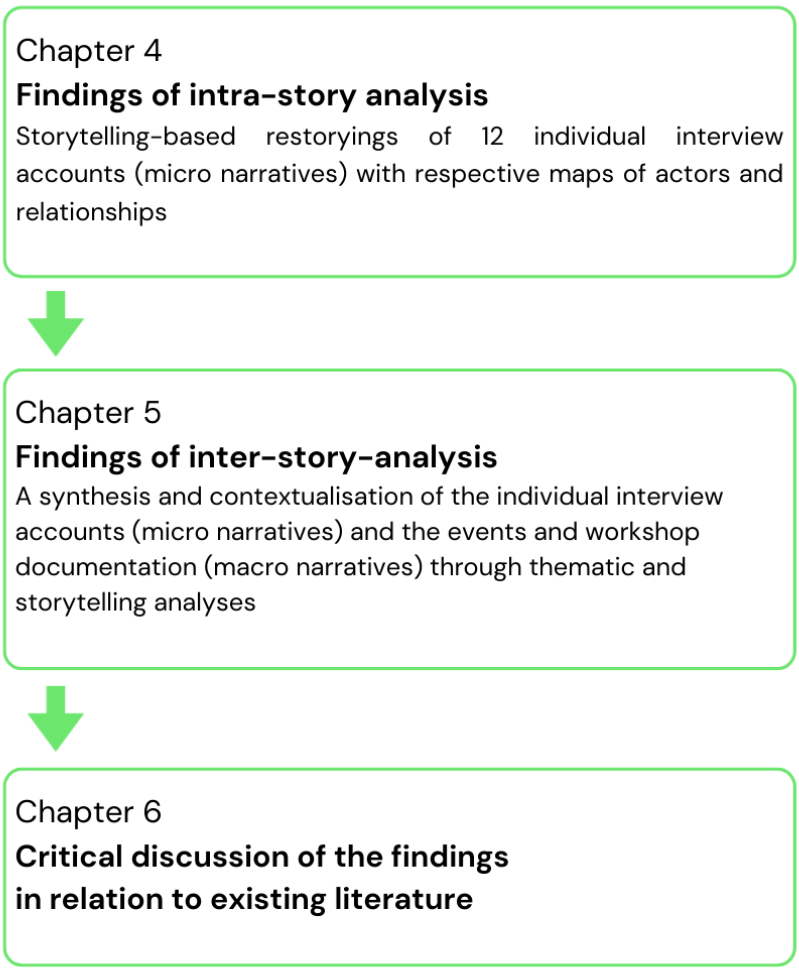


Figure 3.10 Structure and sequence of the findings and discussion chapters (own illustration)

The next chapter presents the findings of the first phase of the two-phase analyses process, the intra-story analysis: the researcher´s restoryings of the micro narratives.

4 FINDINGS OF INTRA-STORY ANALYSIS (PHASE 1)

4.1 INTRODUCTION

This chapter marks the beginning of the findings and discussion section of the thesis. As outlined in the methodology chapter, the study employs a two-phase analytical process (see Figure 3.6), adapted from Chautard and Collin-Lachaud (2019) and Makkonen, Aarikka-Stenroos and Olkkonen (2012). This process requires that individual narrative accounts are first to be reconstructed and interpreted individually before cross-narrative themes and insights can be synthesised. Accordingly, this chapter constitutes the first and methodologically essential phase of the analysis, the intra-story analysis, and presents the researcher´s restoryings of the 12 micro narratives collected in the individual interviews. The subsequent chapter then presents the second analysis phase, the inter-story analysis, in which the synthesised findings are developed (see Figure 3.10).

The focus on the researcher´s restoryings in this chapter fully resonates with the research strategy of narrative inquiry adopted in this study. Narrative inquiry honours the integrity of individual narratives before synthesising and abstracting from them, ensuring that the meaning of each story is preserved within its temporal, relational, and contextual setting (Clandinin and Connelly, 2000; Riessman, 2008, McCall et al., 2019). Presenting the restoryings therefore ensures that the temporal and contextual richness of each narrator´s account is preserved, while also providing transparency regarding how meanings were co-constructed between narrators and the researcher.

Moreover, by presenting the individual restoryings in full, this chapter provides direct access to the narrative evidence on which the inter-story analysis in the following chapter is grounded. This structure strengthens the conceptual validity of the findings by demonstrating how the analytical interpretations are derived from the empirical material. It also enhances transparency in the analytical progression from lived experience to cross-narrative synthesises.

4.2 RESEARCHER´S RESTORYINGS

The researcher´s restoryings are the core components of the narrative research strategy used in this study. The researcher´s restoryings transformed participants' accounts into structured, meaningful narratives that reflect their lived experiences of the plant-based protein food innovation process in their companies (Clandinin and Connelly, 2000).

These restoryings emphasise key characteristics, significant events, and important meanings of the individually experienced plant-based protein food innovation processes. Moreover, they represent the primary analytical process through which the study's research questions were addressed. Grounded in the philosophy of moderate constructivism, this approach acknowledges the co-construction of meaning between the researcher and the participants. Additionally, it provides the contextual depth necessary for understanding complex innovation processes.

Researcher´s restoryings were based on Clemens´ (2018) storytelling framework with the following elements of company setting, main theme, characters, tension, climax, plot, resolution and purpose guiding/structuring each restorying (see Table *3.3*) addressing RQ 1 "What is the innovation process for developing plant-based protein products within food startups and SMEs in Germany?" (Clandinin and Connelly, 2000).

In addition to the restoryings, maps of actors and relationships of the companies´ individual plant-based protein food innovation processes are presented in this chapter. This could reference individuals like the narrator (marked in yellow), groups such as the company´s internal departments and teams (marked in blue) or external organisations or individuals (marked in green). The dotted lines represent the relationship between characters which are further examined in the subsequent chapter. The researcher notes that only the characters explicitly mentioned by the narrators are outlined in the maps. Moreover, the term character includes actors and organisations.

Each of the following subsections of this chapter presents one of the researcher´s restoryings and individual maps of actors and relationships. Table 4.1 presents an overview of the narrators, professional profiles, and company characteristics to contextualise these narratives and familiarise the reader with the restoryings.

Maturity of the company: Clarification of startup and SME classification

A defining characteristic of this overview (see Table 4.1) is the maturity of the companies, which is classified into two categories: startups and pioneering SMEs. This classification is based on both regulatory definitions and sector specific characteristics.

Startups in this study are defined as young (under ten years of existence), innovation driven companies with scaling business models, often seeking internal investment and contributing to market disruption (Röhl and Engels, 2020). This definition is particularly relevant in the German food sector, where startups play a central role in advancing sustainable food production (Rock, Friedrich and Zscheischler, 2025) and alternative protein innovation. According to recent data, at least 90 food companies in Germany are primarily focused on developing plant-based protein food products, the majority of which are startups (GFI, 2023). Consequently, startups constitute the majority of the sample in this research.

In contrast, SMEs are defined according to the EU-wide definition outlined in the European Commission Recommendation 2003/361/EC, which categorises firms based on employee numbers, annual turnover, and balance sheet totals. Specifically, SMEs include enterprises with fewer than 250 employees and either an annual turnover not exceeding EUR 50 million or a balance sheet total not exceeding EUR 43 million (European Commission, 2020). Three companies in the sample meet these criteria and are considered pioneering SMEs. These companies represent early movers in the organic plant-based protein food segment and reflect the origins of the plant-based protein food trend in Germany.

Table 4.1 Overview of narrators and company characteristics as introduction to researcher´s restoryings (own illustration)

Section	Narrator Pseudonym	Narrator´s job profile	Maturity of the company	Offering plant-based protein alternative to	Organic certified	Distribution
4.2.1	W	Head of Product Management	startup company	meat products		B2C retail
4.2.2	F	Lead Scientist	startup company	fish and seafood		B2C retail and B2B food service
4.2.3	P	CEO	startup company	ready to eat meals and meat products	x	B2C retail and B2B food service
4.2.4	H	CEO/ Founder	startup company	meat products	x	B2C retail
4.2.5	V	Managing Director and Partner	startup company	meat products		B2C retail
4.2.6	A	Managing Director DACH	startup company	dairy products (cheese)		B2C retail
4.2.7	T	Head of Marketing	pioneering SME company	meat products	x	B2C retail
4.2.8	Z	Innovation Manager	startup company	animal protein-based protein, snacks, powder and shakes (whey)		B2C retail and E-commerce
4.2.9	K	Product Development Manager	young SME (founded 2010)	meat products	x	B2C retail
4.2.10	C	Head of Innovation and Product Management	startup company	meat products		B2C retail and B2B food service
4.2.11	L	CEO/ Company Founder	startup company	milk and dairy products (cheese)		B2C retail and B2B customers
4.2.12	O	Head of R&D	pioneering SME company	animal-based protein powder and protein shakes, egg and meat products	x	B2C retail

The restoryings are presented in the order in which the interviews were conducted. Each headline of the subsection outlines the narrative focus. The sub-headline in italics includes the main thematic insight of each restorying.

4.2.1 W´s narrative: Open, agile innovation process shaped through internal and external collaborative innovation management in a startup

Main thematic insight: *Building value-driven innovation management through collaborative leadership*

The narrator and company setting

Narrator W´s company is a startup that markets plant-based meat alternatives for the Business to Consumer (B2C) market. The company had been in the market for two years and was founded by an incumbent food company. The main types of innovation are product and process innovation. This company focuses on second-generation plant-based meat alternative products with clean-label recipes, short ingredient lists, and improved product texture profiles.

Narrator W is Head of Product Management.

Main theme

The main theme of W's narrative is how the company's managers shape the innovation process as an open, agile process. Furthermore, W examined how the managers interact with each other internally and with external partners, as well as how they shape a good working relationship.

Characters in W´s narrative

The most important internal company characters in W's narrative are the managers of product management, marketing, R&D and production departments. W belongs to the latter. Project teams for innovation projects also comprise managers from these departments.

The company's external protagonists play a central role in the ideation phase. W stated: *"We are open even in early phases of the process".* Products are tasted via a fixed pool of 75 consumers, who are closely linked to W's company in some way ('family and friends' of the company).

Furthermore, all departments frequently work with student interns, linking the company to other stakeholders such as relevant academics and research institutions. If external knowledge is required to solve development issues, the company's R&D department also connects with and awards research projects to universities specialising in plant-based protein food process research. The R&D team's network also comprises plant-based companies which lack scaling capacities and therefore sell their innovation concepts to businesses such as W's company. W's company also works with an external food development agency specialising in the development of plant-based protein food products.

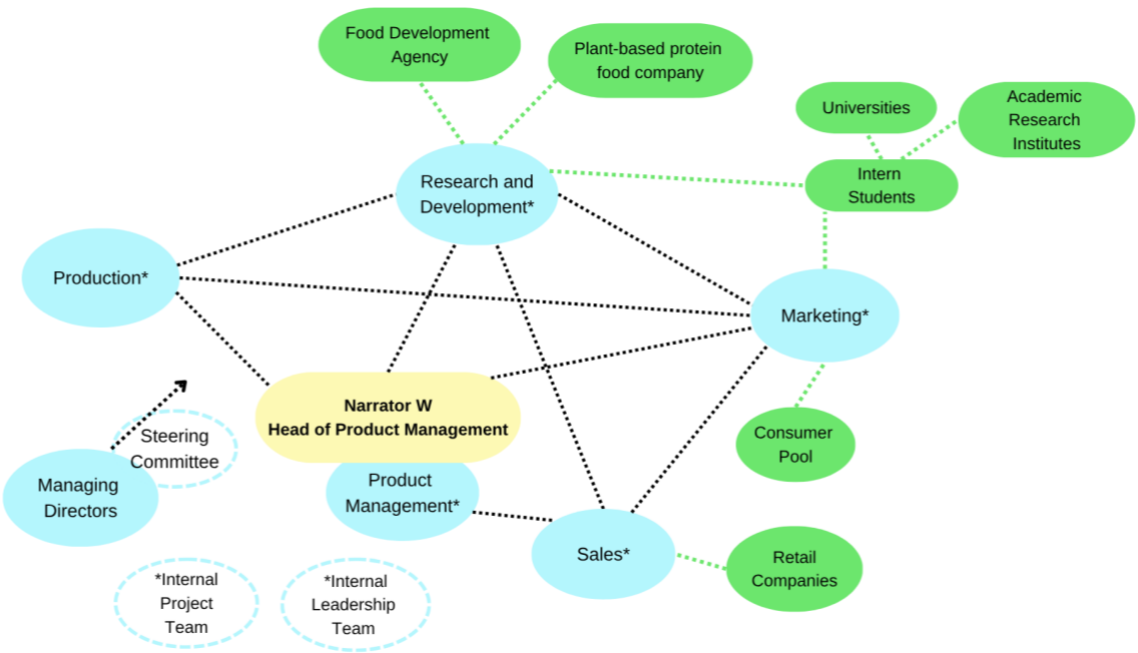


Figure 4.1 Map of characters/actors of W´s narrative of the company´s innovation process (own illustration)

The board of managing directors is involved as gatekeeper in the innovation process, as W´s company implemented the phase-gate process as an innovation project steering tool.

Finally, W's company´s retail partners form the final group of protagonists here. W's company actively involves retailers in the ideation and adaptation phase to empower them as stakeholders.

Tension

Most established food industry companies focus on efficiency, typically for a mature market, which influences their behaviour and culture. As a startup company, W and the managerial team seized the opportunity to establish their own distinctive company culture.

Climax

In the company's initial phase with just a few employees, managers had to find a way to deal with extreme stress and high workload phases in the innovation process. The "*everyone supporting everyone*" startup mentality helped to overcome such situations. Moreover, in an internal crisis situation, the management team ended up taking charge of the situation itself, shaping the way employees and the board of managing directors interacted with each other.

Resolution

To keep this mentality alive, the management team developed a code of conduct, which sets out the interaction with each other and their external stakeholders, which was signed by the board of directors. This code of conduct is characterised by appreciation of each other, mutual support, integrating other perspectives, as well as a value-bound, respectful interaction. Moreover, W´s company encourages a culture of *"having the courage to fail"*, especially when it comes to new ideas and innovation.

Plot

W´s company´s innovation process consists of ideation, concept, realisation on R&D and production/scaling site, implementation, sell-in, adaptation and tracking phases. The

developmental events along these successive phases form a common thread in W's narrative.

Purpose

W stated: "Everyone is feeling part of the project, is involved". This reflects that W's company is characterised by an active and cooperative way of working. Moreover, W explained: *"Everyone is feeling part of the project, is involved".* This statement depicts W's pride in W´s organisation's teamwork and innovation process. Frequent use of words such as 'enthusiasm' and 'empathy' underlines W´s belief in the team. W highlighted that the values driving the company's innovation process stem from the company's brand purpose and vision: being the innovation driver of the plant-based meat alternative category. Moreover, young employees in W´s company are eager to grow the plant-based protein food category, develop the future together and impact the transformation of the food system towards sustainability.

4.2.2 F´s narrative: Accelerating innovation implementation and professionalising the innovation process in a nascent startup

Main thematic insight: *Enhancing agility with professionalisation*

The narrator and company setting

Narrator F´s company is a startup company with a branded plant-based fish and seafood protein assortment. F´s company has already launched a variety of plant-based seafood alternatives. Current plant-based protein innovation projects are focused on technological process innovations to imitate whole-cut fish in a clean-label and affordable manner while responding to consumer demands.

At the time of the interview, narrator F, was the company's Lead Scientist.

Main theme

Crucial to the innovation process of F's plant-based protein food company and running as a main theme through F's narrative is accelerating the market launch of innovations

to increase the company's profitability, enabling further investment into specialised innovative food technology and professionalising the innovation process.

Characters in F´s narrative

The company's internal characters encompass all internal departments in the company's innovation process: marketing, R&D, operations, and sales. According to F, all these departments are involved in the company's innovation process, particularly in the initial phases of idea and concept selection. Furthermore, F noted that "*everyone is involved"* in the review of the process, institutionalised in the quarterly reviews of the OKR (´objectives and key results`) management framework. F explained that this is seen as the company´s agile management tool, which "*goes hand in hand with"* the innovation process management.

F clarified that the R&D department leads the innovation process because of the company's primary focus on R&D-intensive technology and process innovation. Being the lead scientist of the R&D department, F talked in detail about collaboration with research partners in the development phase.

F emphasised: "*We really need to rely on collaborations and on having strategic partners to work with*", as the company is "*young*" and does not have its own technological R&D equipment. F´s company works in close collaboration with external characters, such as academic research institutes or university departments specialising in food technology science. Indeed, F described them as "*parts of the internal R&D department"*.

F mentioned additional external protagonists: a business advisor who specialised in the plant-based protein food category, a co-manufacturing company, as well as suppliers in the scaling phase.

Additional external characters are consumers and Business to Business (B2B) customers. F mentioned proximity to consumers and B2B customers, such as food chefs, as central to the company´s innovation process. Following a typical Design Thinking approach, the company asks consumers and B2B customers to test prototypes of product ideas and provide direct feedback. Furthermore, F emphasised that the company is "*open to adapting*" consumer and B2B customer feedback.

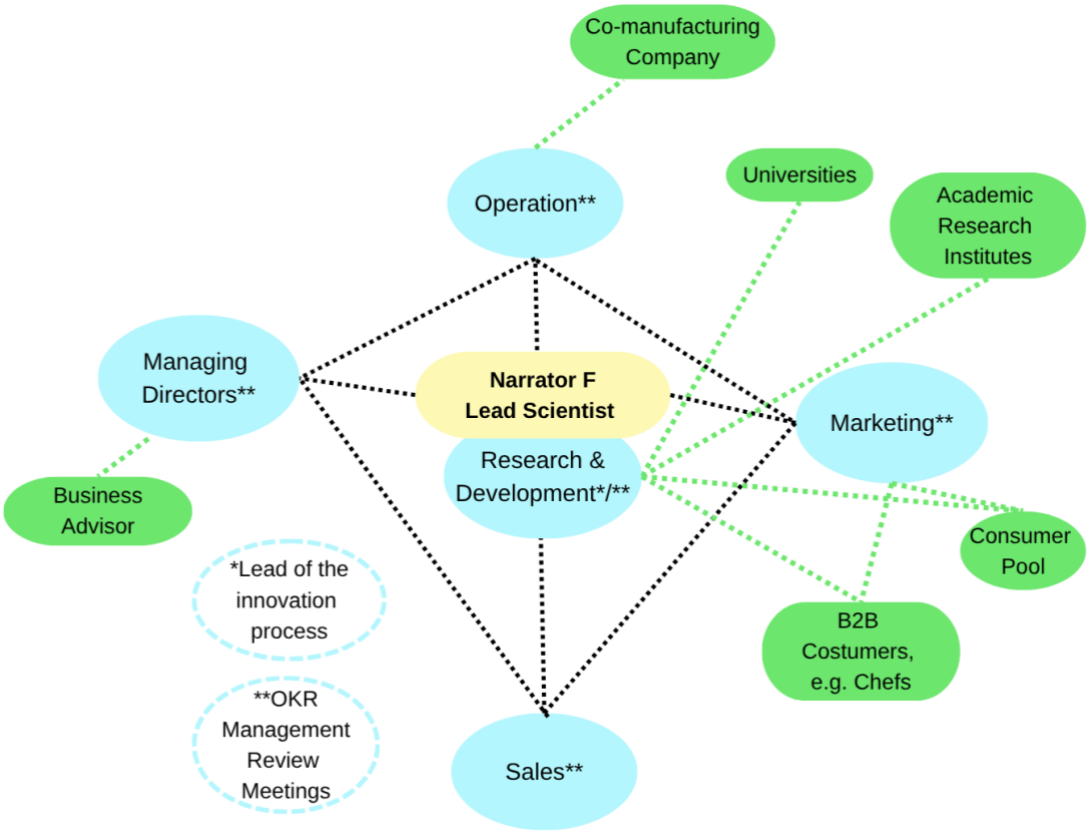


Figure 4.2 Map of characters/actors of F´s narrative of the company´s innovation process (own illustration)

Tension

F reflected the importance of *"focusing on the right", "acquiring a lot of experience"* and even having the *"right network"* when dealing with challenges in the innovation process. Therefore, professionalising the management of the innovation process to grow the business is one of the biggest challenges for the company.

Climax

F's expertise in innovation management was one of the main reasons why F recently joined the company. F brought to F's current role the necessary professional experience gained in R&D departments at established food companies, as well as profound knowledge of plant-based food technology. Recently, F installed an innovation process management tool to focus on the customer needs of different distribution channels.

Resolution

F emphasised that to maximise a young start-up company's potential, it is important to recruit experienced professionals into some management roles, as well as hire a business advisor.

Plot

F commenced the narration by elucidating the company´s current state, detailing the recently launched products, and addressing the obstacles that arise in the field of the company´s innovation. F then went on to explain the company´s concept, idea selection, testing and adaptation, developing, scaling, and commercialisation phases.

Purpose

F stated: "*I don´t see myself as a manager, I've been in management positions but…"*. As a professional scientist F narrated in an analytical style and in a very structured way. F perceived the narration as a valuable reflection of the company's own innovation process and management style.

F described food tasting sessions for "*investors, friends, and family*" as powerful tools for consumer engagement. Invitations go out on social media to followers which results in an inclusive atmosphere on tasting days. Indeed, attending one of these events helped F decide to join the company.

4.2.3 P´s narrative: "Hands-on" innovation process management and resource efficiency in an organic startup

Main thematic insight: *Navigating the innovation process with limited resources through strategic collaboration (co-creation with external partners)*

The narrator and company setting

Narrator P's company is a (small) SME that produces a branded organic and plant-based ready-to-eat meal assortment, as well as plant-based meat alternative products for B2B and B2C channels. P´s company mostly focuses on product and process innovation by

insourcing product ideas and concepts. P´s company develops these ideas and concepts further and adapts them to the needs of its customers, as well as the company´s own specialised production technology of fresh ready-to-eat meals.

Narrator P is the CEO and an active advocate for a plant-based diet (planetary health diet) and sustainability in the food sector.

Main theme

P describes the company´s individual innovation process as "*hands-on*". The company´s innovation process is a flexible, agile process, which is not defined from the beginning, and in which questions and considerations could arise during any phase of the process**.** Furthermore*,* owing to the small size of the company, P emphasised the importance of the efficiency of the innovation process for the company.

Character

External protagonists in P´s narrative are other plant-based protein companies from whom P insources product concepts or with whom P´s company co-creates products.

Other important external protagonists are external experts who provide technical support in the R&D, as well as in the testing and adaptation phases. As the adaptation phase is application-focused, B2B customers, like Food Chefs, play another essential role. Their feedback was iteratively incorporated during the process.

Additionally, P talked about two "*disruptive*" plant-based protein food innovation projects in which other external protagonists played a role: the regional government, which supported and funded the projects, regional research institutions specialising in working with startups, SMEs in the regional food sector, as well as other food companies and a local university.

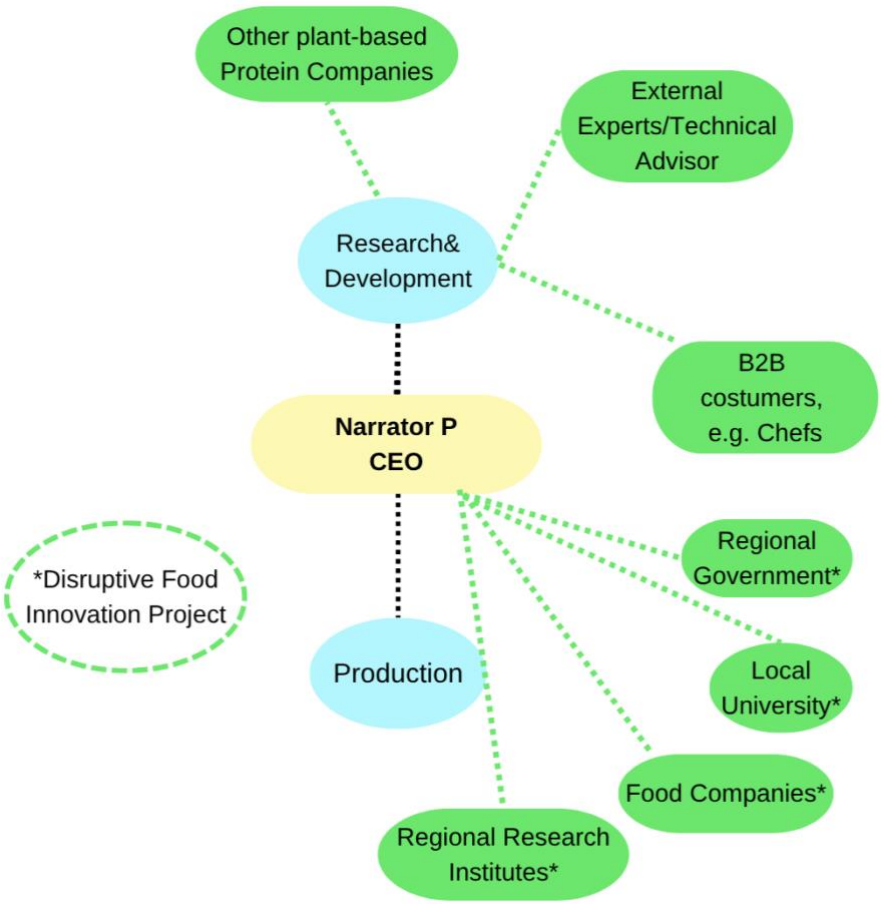


Figure 4.3 Map of characters/actors of P´s narrative of the company´s individual innovation process (own illustration)

Tension

As a small company, it is crucial for P to use limited internal resources (time and employees) as economically as possible and even shorten the innovation process if necessary. P illustrated different innovation cases, such as the insourcing of "*ready-to-implement*" innovative product concepts or the co-creation of innovations with collaborating food companies.

Furthermore, P described the company´s innovation process ideation phase more as a process of coincidences than as a systematic and directed phase. Overall, P´s company is always open to ideas and inspiration. P emphasised:

> ***"****We don´t always have a targeted approach that we say we have to come up with something new and innovative. It is usually something that comes up in everyday*

life, where we realise that something is needed, something could be done, something is missing, or something like that. Or we just come across something where we realise, wow, that's interesting."

Climax

For example, P explained that time and lack of human resources were the main reasons for P's decision to abandon more complex, long-term innovation projects, even though these projects had disruptive potential for the plant alternative protein category. P pointed out that P´s company "*runs the risk of getting bogged down*" by engaging in too many long-term research innovation projects that ultimately bring no immediate economic benefit to P's company itself.

Resolution

According to P, it is better "*to buy ideas (…) in order to conserve resources*." For P´s company it is better to focus on incremental innovation, which expands the company´s current product range. P summarised that it is a matter of concentration, time, efficiency, and resources.

Plot

P shared some general thoughts about a company's legitimacy, openness, and collaboration before immersing in the company´s individual plant-based protein food innovation process. P assumed that customers´ openness towards plant-based diets is generally needed to support plant-based food companies in proving their legitimacy in an omnivorous food business environment.

Furthermore, P gave innovation project examples rather than speaking about the phases of the company's innovation process.

Purpose

P narrated in a very visionary way and gave a lively and detailed description of innovation project examples.

4.2.4 H´s narrative: Collaborative innovation process of an organic startup rooted in gastronomy

Main thematic insight: *Translating gastronomy-based innovation into scalable retail products through external partners*

The narrator and setting

Narrator H´s company is a startup with a branded B2C organic and plant-based protein product assortment in the category of meat alternatives. H´s company´s innovation is mainly focused on product and process innovation. Next to its B2C business, H´s company runs a B2B food service business with a vegan restaurant and catering, where all retail products were originally developed. This gastronomy heritage is part of the company's unique selling proposition.

Narrator H is one of the two company´s founders and CEO of the company. Narrator H and H's founding partner are both career changers in the gastronomy sector and have built their business from scratch.

Main theme

Narrator H focuses on the challenges and opportunities of the collaborative innovation process and the relationships with different collaboration partners. Owing to the lack of industrial production, collaboration plays an essential role in H´s company´s individual innovation process, especially in the scaling phase.

Characters in H´s narrative

As H runs a vegan restaurant business, where the company´s innovation originally developed, restaurant chefs play an essential role in the H´s innovation process. H´s vegan chefs were encouraged to experiment and were open to contributing new ideas and ingredients from their own dietary experiences.

As H does not have an internal production capacity for retail products, the co-manufacturing company is an important protagonist in H´s narrative. Additionally, H´s company works with an external R&D consultant specialising in organic, as well as plant-based food innovation development ("*advocate for organic food"*). H stated: "(…) *it just*

fits, so this chemistry and this collaboration work for us". This statement illustrates how much trust H has in this consultant, who is also a chef (which fits H´s company heritage and USP) and has professional expertise in industrial scaling.

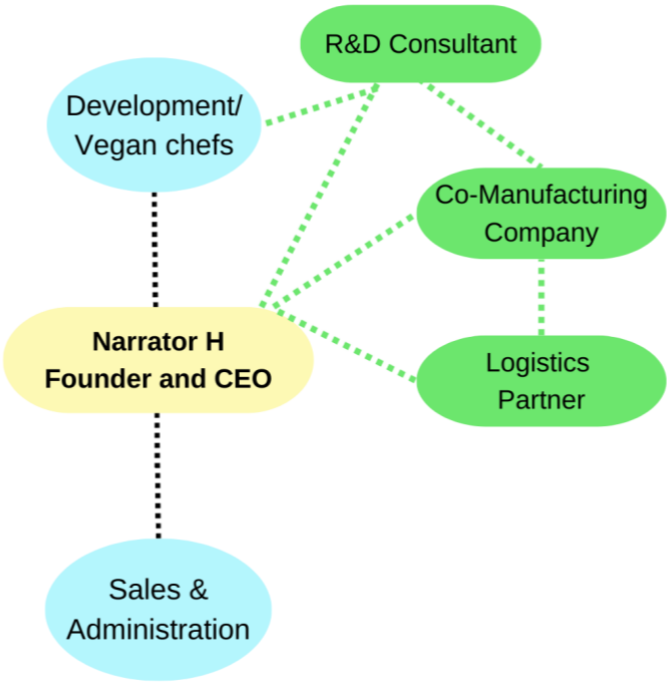


Figure 4.4 Map of characters/actors of H´s narrative of the company´s innovation process (own illustration)

Tension

H emphasised:

> "*Unfortunately, it is usually the case that we are in a position of dependency because we need them more than they need us. But you still don't have to put up with everything, and I still think it's a thing (collaboration) at eye level.*"

This statement reflects the current company constellation. Without its own production of retail products, H is dependent on external partners, especially the co-manufacturing company. The innovative recipes and ingredients developed on a small scale by vegan restaurant chefs have to be scaled up and adapted to the requirements of the co-manufacturer's industrial production lines, which requires considerable time and effort.

Furthermore, the co-manufacturing company needs to be willing to collaborate and do tests, invest knowledge, time, as well as patience.

Climax

H described an iterative process of adaptation between the co-manufacturing company and in-house sensorics' testing:

> *"We do taste tests again, texture tests, everything, and we get comments back. And so, you progress iteratively when you industrialise and professionalise the whole thing, so to speak, to bring it into production somewhere."*

Furthermore, H reflected:

> "*So, it was an incredibly long, iterative process until we got from the first catering recipe to the food retail or out-of-home market recipe that has now been established for two years*."

Resolution

The R&D consultant played an essential role in this adaptation phase. The R&D consultant worked very trustingly with the co-manufacturing company. The co-manufacturing company valued the consultant's experience in the industrialisation process.

Nowadays, the R&D consultant is additionally involved in innovation ideation as the consultant brought innovative product concepts for the expansion of H´s´ current assortment. So far, H´s company offers a plant-based product portfolio based on various vegetable ingredients with taste and clean label benefits to stand out from products purely imitating meat. This portfolio is being expanded through innovation and experimenting with new plant-based protein textures to create variations in texture and taste experiences. These new ingredients cannot be experimented with in H´s restaurant kitchen, as technical equipment is only available at the co-manufacturing company.

Generally, H generates innovative ideas on national trade fairs and customer events. It is important for H to have an open exchange, even with competitors, evaluating each other's products.

Plot

H started the narrative by introducing H´s food business and explained its innovation types. H detailed practical examples of the company´s individual plant-based food innovation process and its challenges.

Purpose

H's passion for the company and food sector is reflected in H´s narrative. Additionally, H articulated clearly and passionately the social factors of building relationships and trust which H also reflected in the context of H´s business experience from other industrial sectors.

4.2.5 V´s narrative: Collaboration in the scaling phase of the innovation process in a nascent startup

Main thematic insight*: Bridging agile startups and traditional food SMEs in scaling*

The narrator and company setting

Narrator V´s company is a startup in the category of plant-based protein alternatives to fresh dairy cheese. The company´s innovation is a product and process innovation which had not been introduced into the market at the time of the interview.

Narrator V is the partner and Managing Director of the company. V is an experienced C-level manager in the food industry. Moreover, V is a consultant and investor in the plant-based protein food sector.

Main theme

V narrated from the startup company perspective, enriched by the expertise V gained as a consultant in the plant-based protein food category and beforehand as a manager in the traditional food industry. V considers collaboration between startups and

traditional food SMEs to be the biggest challenge in the plant-based protein innovation process. This main theme runs throughout the narrative.

Characters in V´s narrative

V listed the external characters involved in the company´s innovation process which are also co-partners in V´s company. One of these companies is a raw material supplier that contributes the necessary expertise in plant-based raw materials, as well as in development, quality management, and production. V's consultancy firm also holds a majority stake in V´s company and delivers expertise in brand building and distribution. Furthermore, V´s company works with a medium-sized dairy company as a co-manufacturing company.

Originally, V´s company was founded by two managers from outside the food industry. Their original new product idea was developed through today's plant-based alternative dairy innovation. This idea transformation was kicked off by a “green” food business advisor who happened to be at one of the company´s first business meetings and directly identified the business potential.

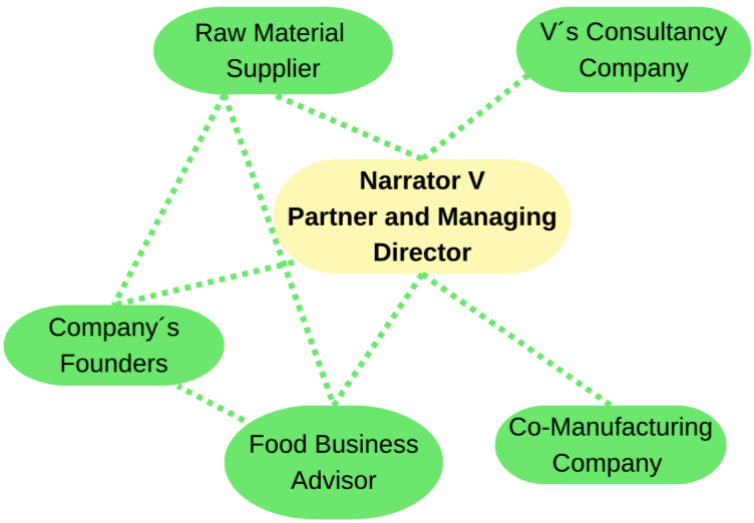


Figure 4.5 Map of characters/actors of V´s narrative of the company´s innovation process (own illustration)

Tension

From V´s perspective, the scaling phase for industrial production is the most critical phase in the plant-based protein food innovation process; V called it the "*neuralgic point"* of the innovation process. Usually, startups in the plant-based protein alternative category develop their product ideas and formulations (ideas, packaging, and production method) in a kind of "*test kitchen*" environment and do not run their own production. They are dependent on co-manufacturing companies, where, in cases of plant-based dairy and meat alternatives, incumbent dairy and meat producing companies come into place. These companies own the necessary technology and food manufacturing knowledge. V often experienced that these kinds of traditional food SME companies find it extremely difficult to deal with the "*inexperience"* and, to some extent, the "*incompetence of food startups*" with regards to their lack of knowledge of industrial food manufacturing.

On the other hand, V explained:

> *"(The traditional food SMEs) don´t know the raw materials, don't recognise the production method. They have no sense of (understanding of) the target group. For them, the plant-based protein food sector represents a great opportunity. But despite their more than a hundred years of experience and independence in terms of money and capacity, they recognise there is a gap, not only in terms of communication, marketing and brand profile, but also in terms of raw materials, when they want to go plant-based."*

V´s statement illustrates that traditional food SMEs lack experience of the complex issues involved in innovating food products from plant-based proteins, as well as knowledge of the plant-based raw material required. They therefore rely on the inflow of expertise and knowledge generated by plant-based startups. The plant-based protein sector also represents a major business opportunity for traditional SMEs.

Climax

V pointed out the following:

> *"Collaboration with startups brings other ways of working, other types of collaboration, virtual technology makes this possible, all of which brings a new dynamic, especially for food SMEs unfamiliar."*

Furthermore, V observed:

> *"(…) from the startup perspective, SMEs are incredibly slow and complicated and pedantic and totally formal and also always totally afraid that something will somehow be taken away from them and vice versa."*

Whereas:

> *"Startups are significantly more agile, significantly more networked, significantly faster than medium-sized companies are used to (…). Startups have a kind of catalysing function; they bring in a lot of oxygen and stir up the air and show these medium-sized companies that things can be done differently."*

These statements illustrates that the different company cultures and ways of working between plant-based protein startups and traditional food SMEs are the main reasons why collaboration fails in the scaling phase of the plant-based protein food innovation process.

Resolution

V's company was able to overcome any conflict in industrial scaling in the innovation process, as V is familiar with the corporate culture and working methods of traditional food SMEs. Furthermore, V brought in expertise as an experienced manager and executive in the traditional food industry.

Plot

V began the narrative with the origin of V´s company. V went on to explain the innovation process and focused specifically on the aspects of collaboration into which V was also able to incorporate aspects of V´s consulting work in this sector.

Purpose

V´s company benefits from V´s experience and network to drive the company's innovation process forward.

V is excited by the idea of the opportunities that the dynamics in the plant-based protein food sector offer for small- and medium-sized food companies to move towards sustainable transformation and food innovation.

4.2.6 A´s narrative: Knowledge as competitive advantage for the innovation process of a startup

Main thematic insight*: Introducing next generation of plant-based meat alternatives to fulfil consumer demands through novel process technology*

The narrator and setting

Narrator A´s company is a startup company with a branded plant-based meat alternative assortment. The company´s innovations are technology-driven and mainly focused on product and process innovations. A´s company is heading to introduce the next generation of plant-based meat alternatives with cleaner recipes which means fewer ingredients and no additives.

At the time of the interview, Narrator A was Managing Director of the DACH region, namely Germany, Austria, and Switzerland.

Main theme

Technological process and plant-based protein raw material knowledge form the main theme of A's narrative, as well as the competitive advantage in the plant-based protein food sector when it comes to innovation.

Characters in A´s narrative

A pointed out that all internal departments are involved in the company´s innovation process.

Narrator A emphasised that planning the innovation process is very important: *"Nothing will go as planned. But you all have to pull together to make the innovation as successful as possible and have understood each other's work."* A´s statement highlights that communication and coordination between internal departments are among the greatest challenges in the innovation process. A pointed to the fact that it is therefore important to form a project team to maintain an overview if all managers or departments want to be involved and participate in discussions. The project lead must represent the interface and coordinate. Overall, A described the company´s innovation process as agile.

In A´s view, the company´s internal R&D department is the driver of the company´s innovation process, as most of the company's product innovation originates from technological process innovation.

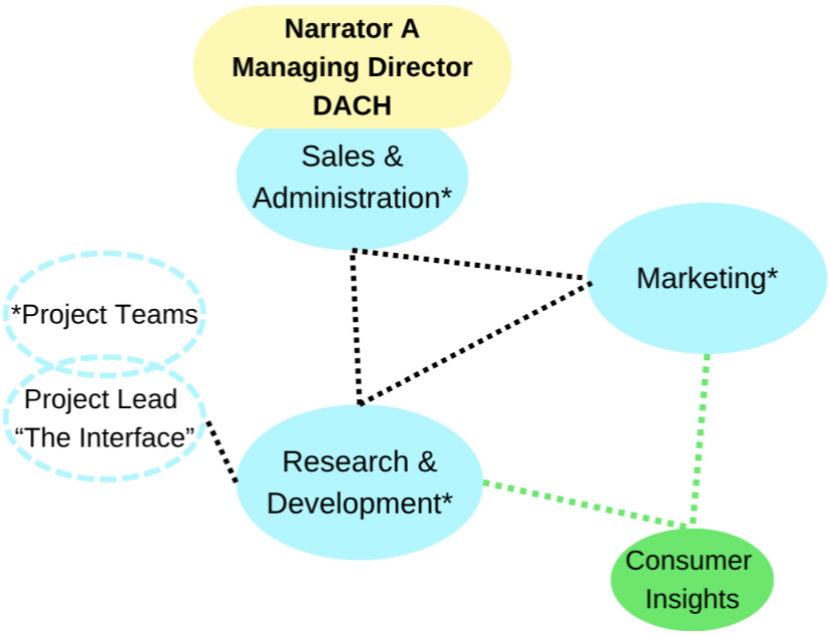


Figure 4.6 Map of characters/actors of A´s narrative of the company´s innovation process (own illustration)

Tension

Today's plant-based meat alternatives are usually made from a variety of ingredients and additives to match the flavour and appearance of comparable animal products, with

the disadvantage of a long ingredients list and consumers´ perception of an artificial product. In addition, the flexitarian target group mainly expects plant-based meat alternatives that imitate the comparable animal product in taste, structure, and mouthfeel.

Climax

A noted: *"From my perspective, the market doesn't really need something new, it needs something better, yes, and that's not so easy*." A's company perceives itself as a Food Tech company and invests an incredible amount of time and energy in the technological process of plant-based food innovation. In addition, this technological process innovation is needed to address the challenge of processing plant-based proteins in such a way that they have the same structure, mouthfeel, and flavour as animal proteins. Moreover, products made of plant-based proteins need to be scalable and standardisable which represents another technical challenge.

Resolution

The aim of A´s company´s innovation process is clearly outlined as achieving the best plant-based imitation of animal meat products in terms of structure and mouthfeel, which is defined by animal protein. Structure and mouthfeel are the basic components that constitute a unique selling point to meet consumers´ expectations.

A new patented technology has enabled A´s company to remove any additives from the product recipes of its plant-based meat alternative innovations, thus creating an enormous competitive advantage for the company.

Narrator A stated:

> "*I think some others at (As company) are convinced that if we take the category to the next level, it does not have to be with a new product, but by making the existing product better. And what is better now: a shorter list of ingredients with products that you know that you have in your fridge or in your spice rack."*

This reflects Narrators A´s convincement that these "*better products*" or "*product improvements*" of next generation plant-based protein meat alternative innovations built further consumer trust and understanding in the category.

A added that A's company did not blindly dive into this technological process innovation. By studying the behaviour of animal proteins in different cooking applications, A's company developed extensive knowledge of proteins and protein structures using different preparation methods.

Furthermore, A reflected:

> "*Yes, and especially at the point where you are in the market right now, you have to think very, very carefully about where your opportunities are in order to be scalable and have volume. Because you also have to reach out to the consumer again to show that your product is better, and accordingly you have to achieve results relatively quickly, ahead of your competition, in order to remain relevant at all."*

This statement illustrates the critical phases of industrial scalability and co-production capacities and especially the critical issues of the commercialisation phase in A´s innovation process.

Regarding innovation´s commercialisation and consumer acceptance, A pointed out the importance of market and consumer insights for a technology- and process-focused startup like A´s company. Therefore, market and consumer analyses must be an integral part of the initial phase of the innovation process which A perceives as a real challenge for a technology-driven company.

Plot

A´s narrative of the company's innovation process is based on two fundamental pillars: On the one hand knowledge and technology of processing plant-based proteins and, on the other hand, understanding the market and consumer needs in the category of plant-based protein meat innovation.

Purpose

A narrated the company´s innovation process from the perspective of a commercial director and highlighted the challenges that A observed as important from a commercial point of view, which A also perceives as a challenge for a tech-driven company in the plant-based protein innovation process.

Furthermore, due to A´s professional experience in various plant-based food companies, A has a critical view of the category itself and the company's own innovation process: "*I think these are the critical parts of this process, but I've never actually experienced a process where I thought, wow, great job.*"

4.2.7 T´s narrative: Consumer centric innovation process in a pioneering organic SME

Main thematic insight*: Adaptation of existing innovation practices to changing market requirements using internal co-creation*

The narrator and company setting

Narrator T´s company is one of the pioneering companies for plant-based meat alternatives in the organic food sector. T's company markets a branded assortment of plant-based meat alternatives for organic retail trade, which has recently been extended to conventional retail trade. The company´s innovations are mainly focused on product innovation. T´s company runs its own industrial production.

Narrator T is the Head of Marketing of the company.

Main theme

T´s narrative is about how T´s company shaped the beginnings of the product category in the organic sector and how the framework conditions for the innovation process of plant-based proteins have changed due to the expansion of the target groups and their needs.

Characters in T´s narrative

Developing products in line with consumer needs is central to T's company. Consumer feedback is therefore very important for product development in the adaptation phase. Innovation prototypes were tested with the company's target groups, for example, via social media influencers. T pointed out the importance of a close relationship with consumers. Moreover, T´s company follows an open, internal innovation process. Employees in the company´s innovation process predominantly follow a vegetarian or vegan diet, and therefore, are also part of the company's target groups. These internal characters are actively involved in the innovation process. They actively participate in the ideation phase and provide feedback during the adaptation phase. In T´s view, employees´ feedback is welcomed by the R&D team, as market and consumer research is scarce in T´s company. T describes this as a creative and open process.

T narrated the ongoing exchange process: A board of managers, from the departments involved in the innovation process, acts as a kind of "*pre-taster"* and have a gate keeping function in the innovation process. However, as in a "*democratic process*", the innovation process can be stopped or adjusted in further stages if other employees, often flexitarians, have concerns.

Other important external characters are retail trade and online retailers, with whom an exchange of innovation ideas is important in addition to their role in commercialisation.

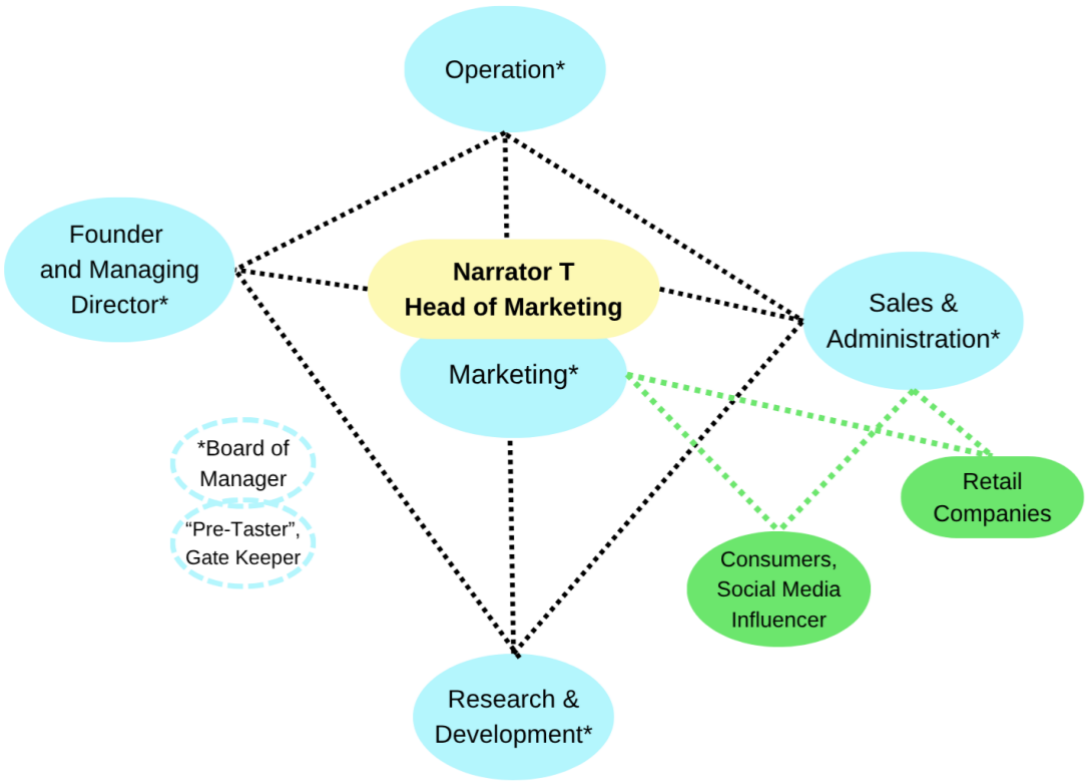


Figure 4.7 Map of characters/actors of T´s narrative of the company´s innovation process (own illustration)

Tension

The first plant-based protein meat alternatives were available for purchase at organic food shops. T's company played an important role in these pioneering beginnings, which are comparable to today's startups in the conventional retail. T elaborated that at that time, plant-based protein alternatives were mainly purchased by vegan consumers, whose focus was on buying animal-free products and for whom the products from T's company are an integral part of their diet. T explained: "*I think we were happy at first to have something that more or less tasted good, was ok in terms of consistency and didn't contain any animal ingredient.*" T´s statement illustrates the pioneering years of the company where innovations were born through experimenting with plant-based protein raw materials, as well as knowledge about the nature and processing of plant-based protein raw materials needed to be built up from scratch. The company founder, a career changer in the food business, imported knowledge about plant-based protein

raw materials from business travels in Asia. The first process and product innovation experiments took place in the founder´s own kitchen.

Climax

Over the decades, consumer demand for plant-based protein alternative products has changed due to the expansion of target groups towards flexitarians, the main target group for plant-based protein meat alternatives for conventional food retail. These target groups are interested in testing new products and favour plant-based protein-meat alternatives that best imitate animal-protein-based product analogues. Therefore, product features, such as meat-like textures and tastes, have become increasingly important for plant-based protein meat alternative innovation. These “new” product attributes have become possible as today´s startups have gained new insights into plant-based protein raw materials and technological processing, which has also benefited T's company and enabled it to expand its distribution to the conventional food retail sector.

Resolution

Organic quality acts as a differentiator for T´s plant-based protein innovation compared with the plant-based protein innovation of conventional companies. Another advantage is that product innovations contain fewer additives and a shorter list of ingredients from the outset, because of the ecological framework conditions that meet today's consumer requirements. However, T emphasised:

> “*Of course, we have completely different and often worse conditions than the conventional ones and that is one reason, for example, why we were unable to use pea proteins satisfactorily up to a certain point. In other words, the manufacturing options, the production methods, the raw materials, the raw materials market - these are also all now also very, very important criteria on the basis of which products are then developed accordingly.”*

This statement illustrates how organic quality requirements pose challenges for T’s company' innovation processes. The sourcing of plant-based protein raw materials of organic quality and securing an organic value chain are just two of the challenges here.

In addition, organic quality means limitations and more difficult conditions for the innovation process of T's company compared to the processes of conventional products.

Furthermore, T noted:

> *"As a medium-sized company, you just have to act within your capabilities and the steps you can take are sometimes a little smaller and therefore a little longer than may be the case with larger companies."*

This reflects that the size of the company also has an influence on T's company innovation process*:*

Plot

T started the narrative explaining how T´s company business started and how innovations developed at the beginning of the company. T narrated aspects of the company's innovation process from a market and consumer perspective related to T´s position as the head of marketing, rather than from an internal operational perspective.

Purpose

T is an advocate of a sustainable food system, animal welfare and a plant-based diet. T's values run through T's entire narrative.

The purpose of T´s company follows the founder´s beliefs in an organic and vegan lifestyle and diet which is also reflected in the "*roots*" of the company. T's company managers were not active political advocates of plant-based nutrition. The managers of T's company are not actively involved in political lobbying in favour of a plant-based diet.

4.2.8 Z´s narrative: Influencer driven innovation process in a fast-paced startup

***Main thematic insight**: Importance of (rapid) ideation to address influencer demands and co-creation to increase innovativeness*

The narrator and company setting

Narrator Z´s company is a startup which markets a branded portfolio of plant-based protein alternative products, as well as animal protein-based snacks and powder shakes which are mainly commercialised via ecommerce and promoted by influencers. The company´s innovations focus on product and process innovations.

Narrator Z is the Innovation Manager of the company. Z's company was not initially plant based. Z initiated the first innovation project to switch from animal-based to animal-free products.

Main theme

Z narrated a consumer-driven innovation process. Z stated that *"(…) social media influencers sometimes have a greater influence within the company or in the entire innovation process than management".* This statement highlights the pivotal role of social media influencers in the innovation process, emphasising their gatekeeping and decision-making functions.

Characters in Z´s narrative

Consumers, especially social media influencers, play a major role in Z´s narrative. Internal characters such as the head of product management, innovation, and R&D managers are involved in the regular "*innovation brainstorming session"'* to review and evaluate innovation ideas. Furthermore, the Board of Managers makes decisions on the "*final go or no go*" of the proposed innovation projects.

Co-manufacturing companies are one of the important external characters. Other plant-based protein food companies, with which Z´s company collaborated for co-creation and co-branding innovation projects, play a role as external characters.

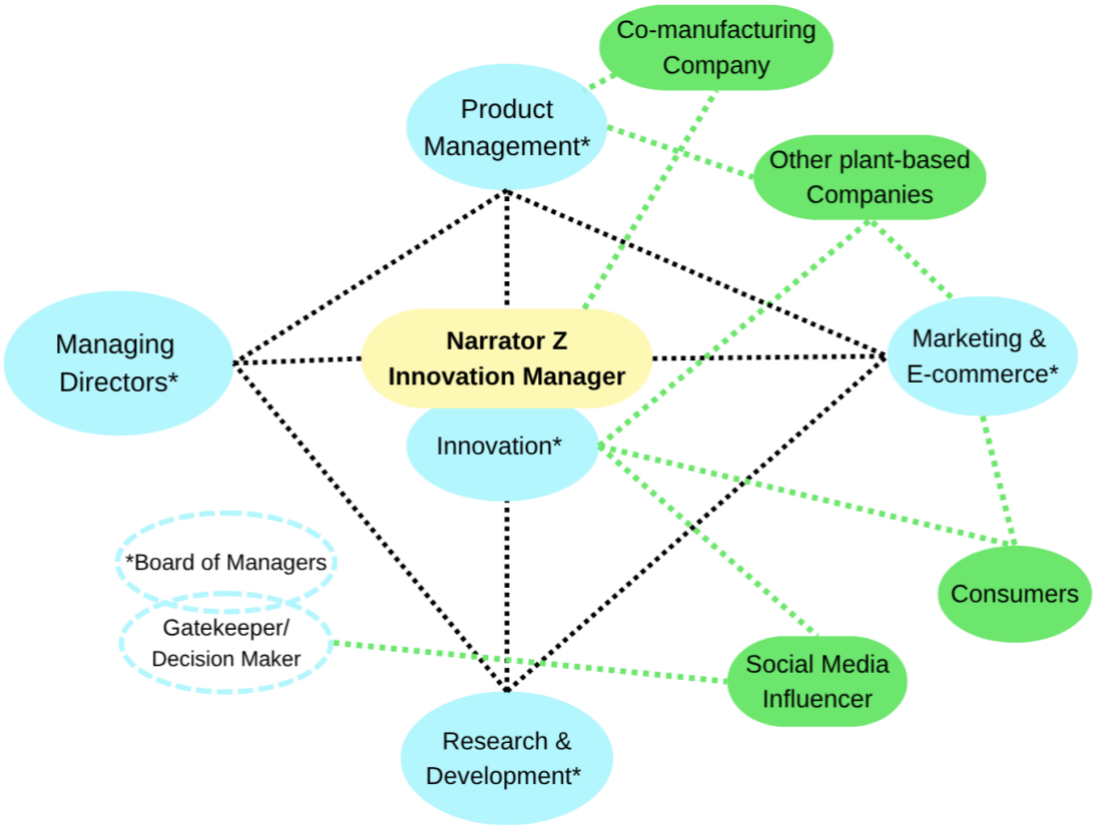


Figure 4.8 Map of characters/actors of Z´s narrative of the company´s innovation process (own illustration)

Tension

Z emphasised that the idea generation phase is very important for Z´s company´s innovation process. The target group of Z's company constantly expects something "*super new*" because of the fast pace of social media. For this reason, very intensive (internet-based) research into the latest information on raw materials, ingredients, product trends and possible potential is conducted during the ideation phase. The results of this research were sent out internally in a fortnightly newsletter. Tasks are already defined here, for example, for R&D to analyse certain product features in greater scientific depth. The "*innovation brainstorming sessions"* are linked to newsletter mailing, in which the ideas, trends, and findings from scientific studies are

discussed and evaluated to identify any hurdles and to check target group fit and market potential.

Additionally, customer feedback is an important source of inspiration for innovation. Z pointed out that consumer feedback is usually not very innovative, as it tends to be an idea for incremental innovations such as a new flavour.

Product innovation ideas are developed with specialised co-manufacturing companies which are researched and selected by Z´s company. The recipes for new product innovations are specified by Z´s company´s internal R&D department. Co-manufacturing companies provide knowledge regarding the industrial scaling of recipes and advice on the adaptation of ingredients and additives required for industrial scaling. During the adaptation phase, five rounds of tasting are usually required before a product recipe is finalised and approved by Z's R&D company.

The final developed products are then presented to the internal management board, with additional information such as market potential, pricing, etc. (product-related business plan) to give the final go-ahead for commercialisation; this is a kind of final stage gate. According to Z, there is no complete stage gate process with several gates along Z´s company´s innovation process. Z took a critical view of this, because if development is stopped at a late stage of the innovation process, it can naturally end in a waste of resources.

Climax

Z summarised that limited human resources, lack of internal processes, and the financial pressure to become profitable as a startup, are framework conditions that strongly influence Z´s company´s plant-based protein innovation process and decisions during the process. Z explained:

> *„So that would be of interest, of course, in order to underpin the products a little scientifically and many people always advertise 'scientifically tested', but it's easy to say that the product recipes are also scientifically substantiated in some way. But, again, that would have been a lot of process, a lot of people, and there was simply a lack of staff to take care of it and write to universities and things like that."*

This statement highlights that the scarcity of human resources and the absence of processes were limiting factors in the failure to collaborate with external academic institutes during the innovation process, despite the potential benefits of such collaboration.

Furthermore, new process technologies play a role in increasing the degree of innovation of new products, which is an important factor for Z's company´s target group. External framework conditions are often the limiting factor here, such as the availability of production capacities for these new technologies, but also legal restrictions, such as the fact that certain process methods are not authorised in the EU.

Resolution

Z gave an example of the co-creation of innovative products with other plant-based protein food companies, such as joint innovation processes, marketing, and/or sales activities, as one way to circumvent these framework conditions and increase the degree of innovation. Z added, however, that project decisions were made primarily for reasons of profitability.

Plot

Z began the narrative with the importance of the ideation phase for the internal innovation process. Z reported this in detail. Z provided a series of vivid and detailed examples to describe the process. Z also scrutinised the process from a critical perspective.

Purpose

Narrator Z set up a cascade of purpose motives and values from profitability to sustainability for plant-based protein food startups, such as Z's company. Z concluded the narrative by stating:

> *“But I think it is such an important thing. Because I'm still totally convinced of everything that has to do with veganism, and that's simply the future and I've also seen that you have to keep up with innovations. You have to keep up with collaborations, and you can definitely make it better, all the processes and I think*

if there's a bit of research and yes, someone takes on the matter, that's super good. I'm really happy about that, so definitely something that helps everyone when they read this, to hear about the output."

Z´s final statement reflects Z's personal and professional commitment to veganism and plant-based nutrition. It also highlights the importance of innovation and collaboration in promoting a plant-based diet.

4.2.9 K´s narrative: Lean innovation management and internal process optimisation in a young value-driven organic SME

***Main thematic insight**: Structural development and cross-departmental communication in the innovation process*

The narrator and company setting

Narrator K´s company is a small food company which markets a branded B2C plant-based meat alternative assortment for organic retail. The company´s innovations include product innovation, followed by technical process innovation. K´s company is an established company in the organic plant-based food sector and runs its own production.

Narrator K is the company´s Product Development Manager.

Main theme

The main theme of K's narrative is characterised by how K's company's plant-based protein food innovation process has already been optimised and what challenges it still faces.

Characters in K´s narrative

Internal characters of K´s company´s innovation process are the managers of the R&D department, including narrator K, and the employees of the production department. The company´s innovation process is led by the narrator K and the head of sales, who additionally provides input and feedback from the company´s retail partners.

Other characters are the CEO, who was one of the founders, who originally developed the process technology at the start of the company´s life.

External characters are food industries, such as bakery industry companies or cheese manufacturers, from whom technological processes were adopted. K pointed out contacts with other external characters, such as external development institutes or academic institutes for collaboration projects in product and process development. Managing these collaborations is a challenge for small companies such as K´s company, owing to time and manpower capacity reasons. Additionally, K´s company works with intern students in product development projects.

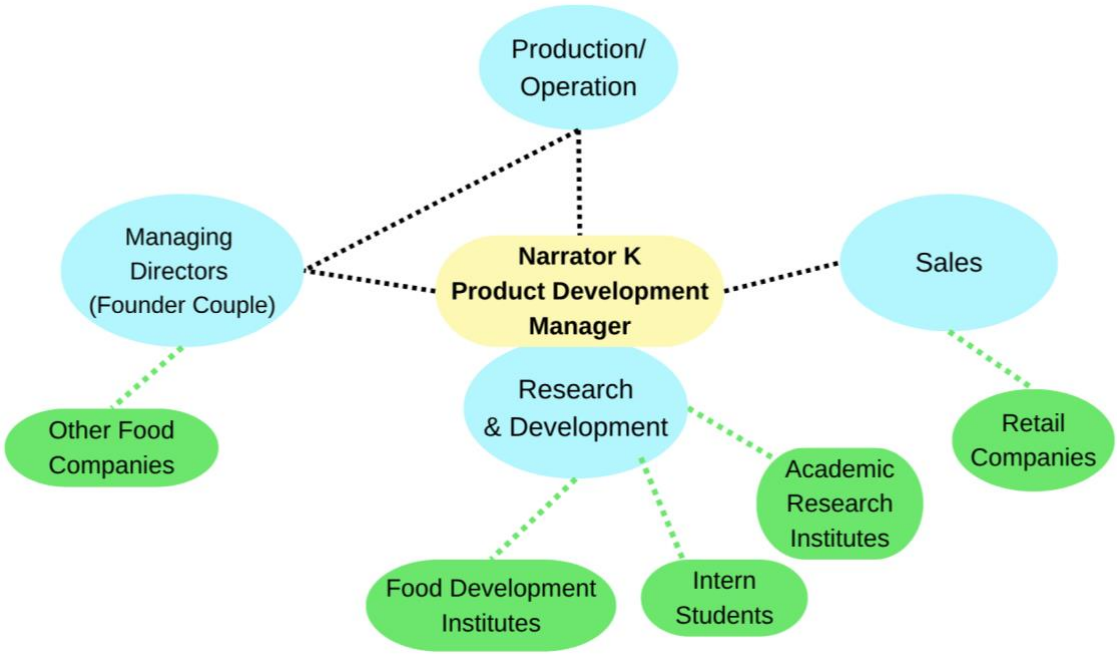


Figure 4.9 Map of characters/actors of K´s narrative of the company´s innovation process (own illustration)

Tension

Today´s product innovation is mainly based on diversification of the plant-based protein raw materials as well as the form or taste of the products. The product innovation process of K's company starts with an idea generation phase in which employees, often also the company's CEO, contribute new ideas. Innovation ideas can also reappear

because they could not previously be realised in product development or the market was not yet ready (the idea is at the beginning stage, based on various impressions). The market analysis followed the ideation phase.

K spoke about "*allowing ideas to mature*" which means that product innovation ideas are further elaborated in the (innovation project) team which also defines the objectives for the innovation process. The ideation phase is followed by a phase of development at the lab-scale level, learning, and measurement with the help of data from sensory panels and adaptation. K installed a permanent internal team to form a sensory panel, which led to quality improvement.

Technology process development is necessary if fundamental changes to the standard portfolio occur in the innovation process, such as changes in the ripening temperature or nutrient composition.

Climax

The founder of K's company succeeded in industrialising the actual manual manufacturing process of their product range. This industrial scaling was the original innovation of K's company and had disruptive potential at the time. K's business and original innovations are based on the knowledge built up by the founders themselves (internal expertise). The experience that the founders had gained over a very long period in the test kitchen gave them ideas on how to do things well. One of the founders and current CEO is a very tech-savvy person who, together with his father, developed his own machines, especially for the company.

Currently, the innovation process of K´s company is aimed at increasing efficiency and optimising production processes. K pointed out that the process of technological process innovation is more sporadic and longer-term, due to the high level of investment required.

Resolution

To ensure permanent optimisation of the innovation processes, K's position was created. K´s position is a type of interface between product development and production. K emphasised:

> "*Why are we actually doing it this way?"* and added *“(…) don't look at it (product innovation) in a detached way from how I implement it in production, what new requirements might I then have in production?”*

K´s self-questioning highlights the importance of taking a helicopter view of one's own innovation process. Furthermore, K elaborated:

> *"In other words, we naturally operate within this cycle system. I do not know if this means anything to you, but I have (…) a background in the startup scene. I know this lean management circle, ‘build-measure-learn’. We always go through these points in exactly the same way, especially in product development."* K added: *“(...) we work according to the lean management concept without people realising that they are doing so.”*

This statement illustrates the very lean innovation process with a highly structured approach that K has installed. K outlined:

> “*And, of course, we have also adopted a lot of ideas from other industries, from the bakery industry or cheese manufacturers, where the processes are quite similar, so that on an industrial scale, the ideas and machines that work there, work in exactly the same way for us*.”

This reflects that K´s company's innovation process is an open process built on an inflow of knowledge (ideas, processes, and machines). Process knowledge has been adopted from other food industries, particularly for product upgrades.

Normally, K's company managers try to involve the operational staff, in particular employees from production, in decisions concerning the innovation process. This is especially relevant when new processes or technology changes have to be installed, so that employees can develop trust and understanding. In this context, K pointed to the

importance of internal communication between departments, for example, between the R&D department and the production department, in order to handle possible feedback and criticism correctly and to evaluate it carefully, especially if it contradicts the previously defined objectives of the innovation process and adjustments are needed. Improving internal communication remains a challenge for K´s company.

Plot

K's narrative plot was based on two narrative strands. One relates to the process of product innovations, and the other relates to the challenges and special features of technological process innovation. K ended the narrative by stating:

> "*Yes, that's really interesting. I had made notes beforehand, but it's completely different when you explain it to someone. Then you get into it completely differently and then it organises itself completely differently in my head (…) to what I've written down*."

This comment highlights K´s self-reflection on the interview.

Purpose

K´s narrative was well-informed. K asked for a Teams Call in advance to clarify the scope of this study and open questions.

K elaborated about the company´s founders:

> "*So, the company really has the same values and ideas as we do. They are doing it for a better world because they are also behind the organic idea, so we were organic from the outset and never had a conventional line or anything like that and did not plan it either, so it was really clear from the outset that if you do it, then it will be organic and then really to do something better, to shape a change in nutrition. That is also our main 'intrinsic motivation' that the two of them brought with them, so to speak. When we support other people's projects, we always have to fulfil this somewhere. That´s clear, and the two of them have already done that."*

This statement illustrates that K´s company is value-driven. K described the organic concept as the company's "intrinsic motivation". The founders, in particular, advocate

the organic idea and want to contribute to the nutritional transformation with their offer of plant-based protein products. As “mentors”, they support startups that pursue the same motivation.

4.2.10 C´s narrative: Design thinking and consumer-centric driven innovation process in a startup

***Main thematic insight**: Aligning product development with consumer needs and brand values*

The narrator and company setting

C´s company is a startup company with a branded plant-based meat alternative assortment. The startup´s innovations are technology driven with a primary focus on product and process innovation. C´s company does not run its own production.

Narrator C is the head of Innovation and Product Management and had recently joined the company at the time of the interview.

Main theme

The main theme in C's narrative follows the ideas of the design thinking method, understanding, and addressing consumer needs in the plant-based protein food innovation process.

Characters in C´s narrative

The external characters of C´s narrative are the co-manufacturing company and their developers which C´s company and internal developers work in the scaling phase. C talked about the benefits and opportunities of combined external and internal resources as “*within the new technologies, it's always the scaling up, that is the most difficult part”.* Other external characters like (academic) institutes, provide support in technology development. C emphasised that the company primarily tries to work with internal development resources when innovating based on existing technology. When it comes to researching new technologies, C believes that external knowledge and collaboration

with external partners are particularly important in order to extend the company´s own creativity

Narrator C has recently joined the startup company to bring C's experience from established larger food companies to the organisation. C's experience will help to better structure the plant-based protein innovation process of C´s company without losing the inherent flexibility of a startup company. In addition, C´s responsibility in the innovation process is to assess how best to utilise internal resources and identify capabilities where external support may be required.

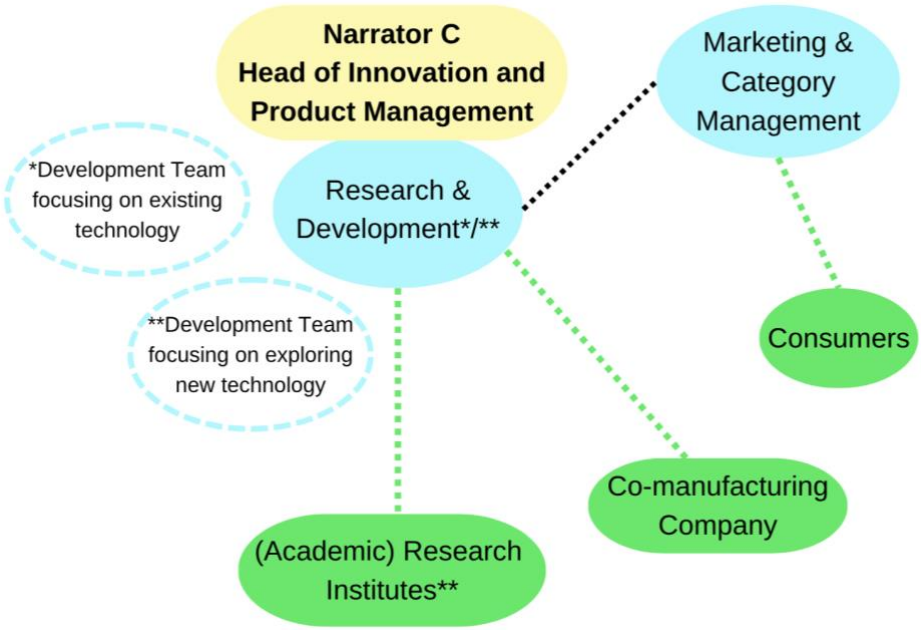


Figure 4.10 Map of characters/actors of C´s narrative of the company´s innovation process (own illustration)

Tension

C´s company´s plant-based protein food innovation process starts with the ideation phase to identify/map category and consumer/customer needs driven by a marketing and category approach. C emphasised:

> "(…) *the better you understand what and how you want to communicate. Of course, like how we want to interact with the market category customer with all those kinds of elements, the better you can be prepared with the product."*

This statement illustrates how seriously C´s company takes the ideation phase. C described in detail:

> "*Of course, you need to develop the product and all the elements of the product defining its nutritional value. All the claims, source of protein and of course the whole, we call it the product bundle, which is packaging, consumer communication and the key is the product in terms of taste, texture and the nutritional profile."*

This illustrates how by determining the ´jobs to be done`, product specifications are defined to start the product development process. In addition, C *stated "(…) depending on the difficulty and the complexity of the product, it's either a very short or very long process."*

C explained that leading the innovation process, as well as managing the development of new products, requires a lot of project management. For incremental innovation, such as product diversification, C´s company development occurs entirely internally, which is often the case in this type of business. C emphasised for completely new products "*we're using (…) our partners to develop this with us and we are defining the key elements of the product and then of course it's starting the development of the product."*

C's company has a dedicated development team that focuses on the development of existing technologies. Another team focuses on new technologies. This team experiments freely and does not explore within a fixed framework. Overall, C considers the category of alternative proteins as experimental.

Climax

C stated:

> *"So, like, at the end, food is food, and food is in our culture (…). We have a (…) special bond with food, regardless of whether it is vegan or non-vegan. So, this background behind and what is inside the product and as well the perception of that is absolutely the key for the product to be successful."*

This statement reflects that C is reasoning the sociocultural context of food and nutrition. For narrator C, it is crucial to critically observe the process technologies required for C´s company innovations, especially with regard to consumer perception, in order to be successful at market launch. Plant-based protein meat alternatives have the problem that they tend to be perceived by consumers as 'artificial' and 'over-processed', which may be related to the technology, i.e. they are produced.

Resolution

Consumers favour product features such as taste and texture for their purchase decisions. These are the primary elements that determine the market success of a product innovation. The technology was only a supporting element. Therefore, C tries to integrate this understanding of putting consumer needs at the centre into the plant-based protein meat alternatives innovation process of C´s company. From C´s perspective, consumers are both the starting and endpoint, and the process technology is merely a supporting element. C continued that while technology plays an important role in the innovation process, if the product innovation becomes over-processed, unhealthy, or full of chemicals, it loses value as a consumer brand, even if it is technologically impressive.

Plot

As C had only recently joined the company at the time of the interview, C's narrative builds on the critical observations that C had previously made about the innovation process in C´s company and was able to compare with C's experiences. C narrated in a structured and factual but also very passionate way, especially about the concept (meaning) of food for the consumer, which C illustrated through the use of many metaphors.

Purpose

Narrator C is a highly experienced food innovation manager. As a senior leader, C sees C´s role as supporting the team, "*creating the background for my people to develop*" and enabling creativity. C ended the narrative by stating:

> *"The step that the category took over those couple of years is tremendous. Right. Therefore, like we have this potential to bring amazing, delicious food, which is not only great in terms of taste, but also good for your nutrition. So, it is healthier and on top (…) sustainable for the planet. That's a perfect mix. Of course, there is plenty still to be done in this category, but (…) if we believe it can be the new normal and of course it can be the new normal only if you can use it every day."*

This final statement illustrates that C believes that, if C's company wants to build a responsible and sustainable consumer brand and realise its mission of establishing plant-based protein food as "the new normal", it needs to produce "good food for people". Moreover, C is enthusiastic about working in the plant-based protein food category because of its uniqueness and market potential to offer healthy and sustainable food.

4.2.11 L´s narrative: B2B co-development and resource efficient innovation process in a startup

Main thematic insight: *Market-driven innovation through reversed development sequencing and strategic co-creation*

The narrator and company setting

L´s company is a research and innovation-driven startup company, of which more than a third of the employees work in in-house research and development. L´s startup´s original disruptive innovation is an innovative upcycling process technology for the extraction of plant-based protein raw materials from natural plant-based side-stream materials. L´s company distributes both the innovative plant-based protein raw material

and product solutions made from it for the dairy, confectionary, and snack food industries. Furthermore, L´s company markets its own B2C branded product portfolio.

Narrator L is one of the startup´s founders and CEOs.

Main theme

The main theme of L's narrative was the collaboration with established B2C food companies in the company's innovation process. L describes these collaborations as the *"DNA"* of L´s company, the most important driving factor for business success and company growth.

Characters in L´s narrative

The external characters in L´s narrative are food companies, referred to by L as customers, mainly SMEs alongside large corporations from the dairy, confectionary, and snacks food industries, with whom L´s company collaborates in the innovation process. For example, product developers of these companies complete the development of product prototypes developed by L's company for the end consumer market.

Further external characters are co-manufacturing companies in which L´s company collaborates in the scaling phase of innovation products for L´s company´s own B2C brand product portfolio.

Universities and external research institutes are involved in L's company innovation process: the development of basic upcycling process technology for extracting plant-based protein raw materials. University students, mainly from the field of biotechnology, become internal characters of L's company, as they are employed in the R&D department of L's company; here they simultaneously conduct research and write their theses. L described this as a "*good mix*". Universities can thus offer career entry for their students while L´s startup company benefits from knowledge transfer and favourable labour costs.

Narrator L is a career changer in the food business and responsible for the company´s sales activities.

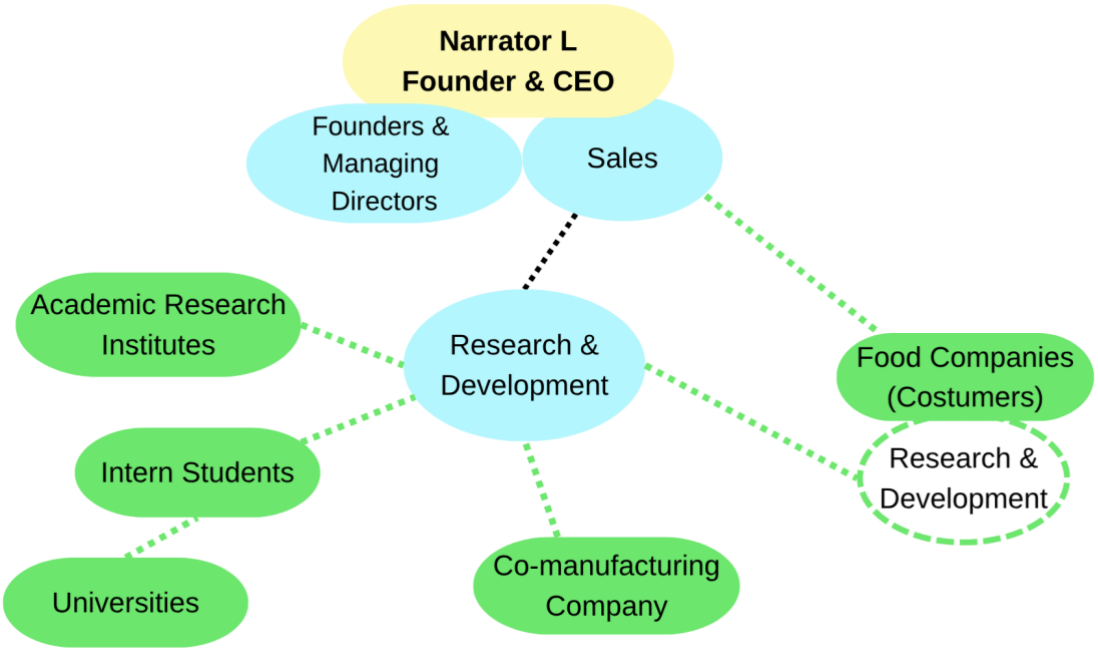


Figure 4.11 Map of characters/actors of L´s narrative of the company´s innovation process (own illustration)

Tension

L´s company´s plant-based protein food innovation process begins with the ideation phase, in which L´s company analyses market segments and customer needs for its raw materials and potential product solutions. This is immediately followed by the commercialisation and sales phases. In the market or product category segments with business potential, the most important market players are identified and acquired for possible collaboration. L discusses plant-based protein product innovation ideas with prospective customers to assess customer interest, potential, and product requirements. Thus, L´s company gains an understanding of whether the innovation development process is worthwhile and feasible. L added that the subsequent research and development phase only takes place once collaboration has been fixed and development costs have already been financed.

In this context, L explained: "*This can be a very disruptive innovation, in terms of really new technologies, new process technologies, or it can be product innovation. The most*

common is product innovation." This reflects the range of types of innovation that the company normally deals with.

Moreover, L emphasised: *"So we very, very rarely develop completely finished products because we are simply good at producing raw materials, that's our innovation, and using them to build the first prototypes."* L´s statement illustrates how L´s company approach the R&D phase. L´s company develops prototypes that are assessed by the customer/collaboration partner in the adaptation phase. L pointed to the most important product parameters, such as taste, texture, health benefits, and ingredients, which are normally assessed. In an iterative process, L´s company developers adapt the recipes of appropriate prototypes accordingly. Finally, the R&D department of the collaboration partner usually finalises and scales prototypes to consumer suitability.

Climax

L emphasised that when collaborating with established food companies in the innovation process, it is important to get a good feel for their needs through the acquisition process. On the other hand, a startup like L's company needs to ensure that constructive tension is maintained during the whole collaborative innovation process. It also needs to be convinced of effective performance in terms of, for example, meeting timelines and speed. On the other hand, established food SMEs must understand that the collaborative innovation process with a startup is based on trial and error.

Resolution

L pointed out:

> "*Medium-sized companies are actually our typical cooperation partners and SMEs are more flexible. Of course, it is best if it is a family business, for example, where the culture is completely different and everyone is relatively well informed at a certain point (…). That means it's much easier to plan.*"

This reflects the narrator´s preference for working with family run food companies from the Mittelstand sector, as they are more flexible than large corporations. The

collaborative innovation process is more manageable, as all departments of these companies are usually informed and involved in the innovation process:

In addition, L noted that building a good relationship in a collaborative innovation process is particularly important to create acceptance for possible mistakes and formulate expectations correctly.

Plot

The narrative of L's company's plant-based protein innovation process is distinguished by its unconventional approach, in which the company reverses the traditional sequence of innovation phases by moving directly from the ideation phase to the commercialisation and sales phases. L describes this particular (unique) approach as a very effective innovation process for a startup in terms of the efficient use of internal resources and economic risk management, as the commercialisation of the final B2C product of plant-based protein food innovation lies with the collaborating partner or customer. L narrated passionately and with vivid examples from the perspective of sales and collaboration with food companies in the plant-based protein food innovation process.

Purpose

L´s company´s intrinsic motivation is to leave the smallest possible ecological footprint in the food industry, conserve resources and operate within a circular economy. L elaborated: "*We are really lucky that our raw material is very, very ingenious."* This statement highlights the company´s unique plant-based protein raw material and its potential as a door opener to a better, more sustainable food system. However, L also expressed concerns, stating: *"In the end, it's always about profitability, sustainability is the enabler."*

4.2.12 O´s narrative: Internal creativity and encouragement of employees in a pioneering organic SME

Main thematic insight: *Employee driven ideation and structured process implementation (fostering creativity in a structured innovation process)*

The narrator and company setting

Narrator O´s company is an established medium-sized food company which markets a branded B2C plant-based protein alternative assortment for whey, egg, and meat products for organic retail, alongside private label solutions. The company´s innovations are mainly product innovations followed by technical process innovations. O´s company describes itself as a pioneering company of an "*organic vegan nutrition"* and runs its own production.

The narrator O is the Head of Research and Development of the company.

Main theme

The main theme of O´s narrative highlights the company's reliance on the internal creativity of its employees, and the active encouragement of this creativity. Within O´s company´s agile innovation process, new ideas typically emerge from application-based experimentation in the test kitchen, rather than from research into new process technologies. This approach reduces the need for extensive external collaboration.

Characters in O´s narrative

O emphasised the involvement and participation of all employees, respectively from all the company´s departments in the innovation process. The company relies strongly on its employees' creativity in the innovation process, especially the playful creativity of R&D employees who also follow a vegan diet. O added*,* the proof that this unique approach works well is shown by the fact that O´s company won two Innovation Awards at an important food trade fair for the sector.

In addition to the personal motivation of employees, O emphasised the importance of a creative and open working environment. As the Head of Product Development, O

considers O´s responsibility that of facilitating and promoting this creative working environment: to take up ideas as a team and develop them further collaboratively.

Other external characters in O's narrative are customers such as retail partners who generate innovation ideas in the concept phase. In the scaling phase, co-manufacturers join the process in tasks that O's company is not able to do on its own, for example innovative sustainable packaging solutions.

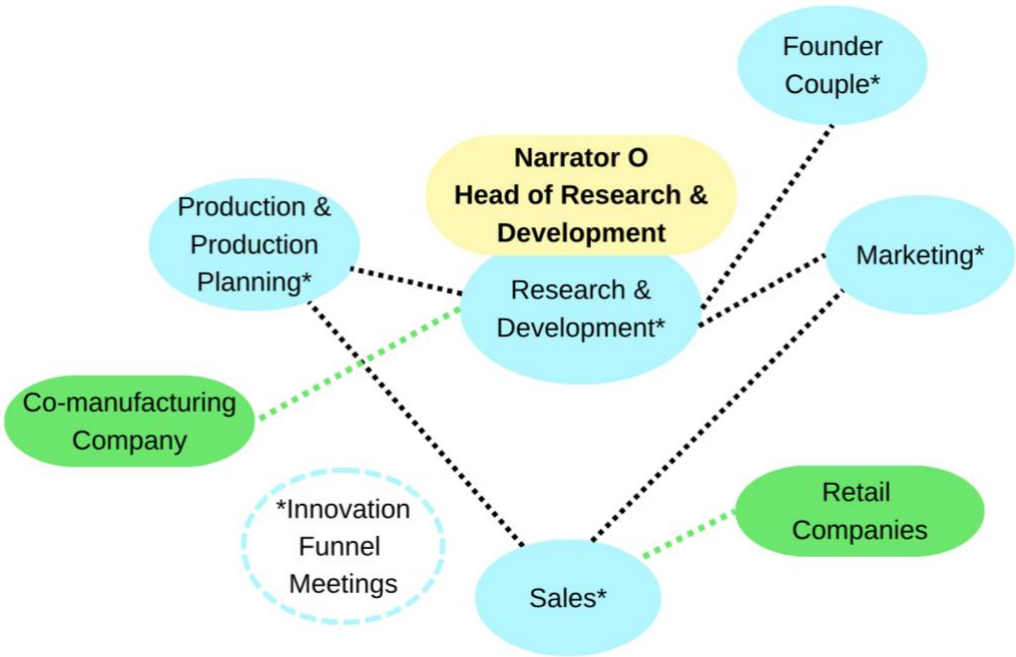


Figure 4.12 Map of characters/actors of O´s narrative of the company´s innovation process (own illustration)

Tension

O narrated that O´s company´s innovation process is managed through the innovation funnel concept, as well as a phase and gate process management with "*funnel meetings"* after each innovation phase. The innovation process begins with the (ideation and) concept phase. Innovation ideas are generated by customers, as well as internal employees, managers, or in specialised innovation workshops. Based on the innovation ideas, the first concepts, complemented by information such as market potential or internal implementation options, are drafted and presented to all members of the innovation funnel. The funnel meetings are made up of interdisciplinary members from

the production, production planning, marketing, and R&D departments. In the development phase, product recipes are created which are tested and realised with production in the realisation (scaling) phase. O´s company´s innovation process ends with the product launch and market introduction.

Climax

O explained that in the early days, the founding couple guided the innovation process largely based on intuition without relying on formal structures or processes. He added that the company has since adopted a phase-and-gate management process approach to bring more structure into its innovation efforts.

Resolution

In the past, employees were able to openly express their ideas and concerns during the innovation process, but information flows remained unstructured. O stated: "*Now it's easier because information is distributed and requested in a targeted manner and there are active approvals for the next phase."* This statement reflects that the newly implemented stage-gate management process has improved the directed flow of information within the organisation and between departments. As a result, employees feel more involved in the process, a waste of resources can be avoided, and the risk of errors is limited. O added that employees feel more accountable when they actively seek approval and move to the next phase.

Moreover, O reflected:

> "*It is important to us that all departments can always add their two cents and that everyone can say, does it suit me or does it not suit me. And I have concerns that we need to look into because one person cannot be aware of everything, so it is important that the perspectives from distribution, marketing, product development, technology and production all flow in."*

This statement highlights O´s company emphasis of an open, agile exchange between the departments.

The marketing department leads the project management of the company´s entire innovation process. O commented: "*It works very well. They set the schedule and control the process a little.*"

Plot

O narrated in a factual style along the company´s innovation funnel concept which was implemented to structure internal processes. O is convinced of the creative power of internal employees and how important it is to encourage them; this is reflected in O's narrative.

Purpose

O elaborated: "I *believe that we are already making a big contribution to sustainability with organic food and vegan food, and that's all we have*." This statement illustrates that O's company has been a vegan, as well as an organic company from the outset, sustainability has been anchored in the company's purpose from the very beginning. This sustainability concept naturally characterises everything O´s company does, including brand purpose and innovation process. Moreover, O noted:

> *"We have ideas about this, we also have many people in the company who are personally convinced of this, including myself, and we try to fulfil this to the best of our knowledge and belief."*

This reflects the personal conviction of employees including the narrator.

4.3 SUMMARY

This chapter presented the individual restoryings, which constitute the first phase of the two-phase analytical process employed in this study. The purpose of this chapter was to retain the richness and contextual depth of each participant´s lived experiences. This provides the essential added value of analytical transparency by presenting how meaning was co-constructed and how individual insights emerged.

The key learnings and main insights derived from these restoryings, along with the corresponding maps of actors and relationships, provide a rich foundation for subsequent inter-story analysis presented in chapter 5. As a key phase in the overall analysis, the insights generated here directly inform and enable the cross-narrative synthesis undertaken in the following chapter: a process further outlined in Section 5.2.

The restoryings also demonstrated how the narrative focus of each participant was shaped by their professional role, personal characteristics, and values. The participants consistently acknowledged that the narration of their innovation processes was both meaningful and beneficial, reinforcing the value of the storytelling approach.

The next chapter presents the findings of the inter-story analysis, in which cross-narrative themes and conceptual insights are developed.

5 FINDINGS OF INTER-STORY ANALYSIS (PHASE 2)

5.1 INTRODUCTION

This chapter provides the findings of the second phase of the two-phase analytical process adopted in this study (see Figure 3.10). It comprises the inter-story analysis, which is based on the 12 individual restoryings developed in Chapter 4. In addition to the restoryings, two narrative interviews with managers from traditional medium-sized food companies engaged in collaboration with plant-based protein food startups are included. These additional accounts provide an alternative perspective on collaborative innovation and management capabilities, thereby corroborating and enriching the findings derived from the inter-story analysis of the restoryings from the purely plant-based food companies.

The findings presented in this chapter address the study´s three research questions.

First, this study´s researcher developed a synthesised perception of the plant-based protein innovation process to answer RQ 1: “What is the innovation process for developing plant-based protein products within food startups and SMEs in Germany?” The findings are structured using the methodological framework for dynamic network processes.

Secondly, this chapter explores actors, collaborative relationships, and collaboration enablers and barriers in the innovation process to address RQ2: “How do plant-based protein food startups and SMEs collaborate with their network in the innovation process?”

Third, it introduces the findings of capabilities required for managing the innovation process to answer RQ3: “What capabilities are required to manage the innovation process in the plant-based protein food industry?”

5.2 BRIDGING INSIGHTS: FROM INDIVIDUAL INSIGHTS TO CROSS-NARRATIVE THEMES

The previous chapter presented the intra-story analysis, providing 12 restoryings that captured the lived experiences of managers from purely plant-based protein food companies about their company´s innovation processes. These micro narratives, grounded in participants´ interview accounts and restoried through the researcher´s storytelling process, revealed diverse insights shaped by professional roles, organisational contexts, and personal motivation. These individual accounts not only address the research questions at the Micro level but also lay the foundation for identifying broader patterns and conceptual insights.

This chapter builds on these foundations by synthesising cross-narrative themes through the inter-story analysis. This second phase of analyses moved beyond individual experiences to explore shared meanings, tensions, and strategic approaches that characterise the innovation process in the plant-based protein food sector. Addressing the aim of this study, these findings are constructed to provide a deeper conceptual understanding of the plant-based protein food innovation process, if and how collaboration unfolds and the required management capabilities (see Figure 3.6).

5.2.1 Recap of analytical process

The inter-story analysis (phase 2 of analysis) presented in this chapter builds on the analytical process outlined in Chapter 3 (see Figure 3.6), building on the narrative foci and main thematic insights identified in the intra-story analysis (phase 1 of analysis). These insights served as the analytical foundation for a reflexive thematic analysis along with additional extracted story fragments from the macro narratives. Table 5.1 presents a summary of these insights. In the thematic analysis, the researcher derived codes and iteratively grouped and reconstructed them into broader cross-narrative themes. This process was guided by inductive interpretation and theoretically informed reconstruction, drawing on the meta-framework for dynamic network processes.

The cross-narrative themes serve as focal and contextual events in this process (see Figure *3.7*).

Table 5.1 Initial codes for inter-story analysis derived from the inter-story analysis (narrative foci and main thematic insights) (own illustration)

Section	Narrator Pseu-donym	Narrative foci*	Main thematic insights*/**
4.2.1	W	Open, agile innovation process shaped through internal and external collaborative innovation management in a startup	Value-driven innovation management, collaborative leadership
4.2.2	F	Accelerating innovation implementation and professionalising the innovation process in a nascent startup	Enhancing agility with professionalisation, accelerating market launch, access to technology, profitability
4.2.3	P	"Hands-on" innovation process management and resource efficiency in an organic startup	limited resources, strategic collaboration, co-creation
4.2.4	H	Collaborative innovation process rooted in gastronomy of an organic startup	Translating innovation into scalable retail products, external partners
4.2.5	V	Collaboration in the scaling phase of the innovation process in a nascent startup	Bridging agile startups and traditional food SMEs, importance of scaling phase
4.2.6	A	Knowledge as competitive advantage for the innovation process in a startup	Entering next generation of plant-based meat alternatives, fulfil consumer demand, novel process technology
4.2.7	T	Consumer centric innovation process in a pioneering organic SME	Changing market requirements, internal co-creation, expansion of target groups
4.2.8	Z	Consumer (influencer) driven innovation process in a fast-paced startup	Importance of (rapid) ideation, consumer (influencer) demands, co-creation and branding, increase innovativeness
4.2.9	K	Lean innovation management and internal process optimisation in a young value-driven organic SME	Structural development, cross-departmental communication
4.2.10	C	Design thinking and consumer-centric driven innovation process in a startup	product development, consumer needs, brand values
4.2.11	L	B2B Co-development and resource efficient innovation process in a startup	Market-driven innovation, reversed development sequencing, strategic co-creation
4.2.12	O	Internal creativity and encouragement of employees in a pioneering organic SME	Employee driven ideation, structured process implementation, fostering creativity in structured innovation process

**Served as foundation for the initial coding process of the inter-story analysis*

***Wording of main thematic insights in this table is adapted for coding clarity and may differ slightly from narrative subheadings in Chapter 4*

The researcher presents the narrator quotes throughout this chapter to support transparency in cross-narrative synthesis. Where multiple perspectives converge, sublines beneath thematic headings refer to the supporting narrators and the corresponding restorying sections. Otherwise, quotes are embedded within the text to maintain the narrative flow.

In addition to narrative foci and thematic insights, the researcher reviewed the map of actors and relationships developed in the intra-story analysis to identify recurring actor types, relational patterns, and collaboration models. These visual data support the synthesis of cross-narrative themes related to collaboration dynamics and actors´ roles in the innovation process.

The following section presents a synthesised perception of the innovation process within the plant-based protein food sector.

5.3 SYNTHESISED PERCEPTION OF THE PLANT-BASED PROTEIN FOOD INNOVATION PROCESS

This section presents cross-narrative themes and their reconstruction into focal and contextual events of the synthesised plant-based protein food innovation process. This was achieved by employing the methodological framework of Makkonen, Aarikka and Olkonnen (2012) to answer RQ 1.

The Figure *5.1* illustrates the cross-narrative themes through the four analytical levels of this model, which comprises contextual events at the Macro, Meso, and Micro levels, as well as focal events. Moreover, the researcher outlined the actors and collaborative relationships involved.

At the Macro and Meso level, contextual events and structural properties, broader societal and sector driven forces are depicted. The Macro level includes “plant-based diets accelerating food systems transformation”; the Meso level involves “the shift in consumer needs” and “political support and strategies” for the sectors´ innovation.

The Micro level captures contextual events at the company level, such as “profitability”, “degree of openness”, “company maturity” and “knowledge as a competitive advantage”.

Focal events in the innovation process focus on internal innovation dynamics, including “unlocking and expanding creativity”, “improving and optimising the process” and “extending knowledge”.

Actors are interrelated with contextual events and structural properties during this process. The findings on actors and collaborative relationships are outlined in Section 5.4. Both “internal collaboration” (e.g. cross-departmental teamwork) and “external collaboration” with suppliers, co-manufacturers or research institutions are shown in Figure *5.1*. Moreover, the arrows between the elements indicate interconnectedness and influence across levels.

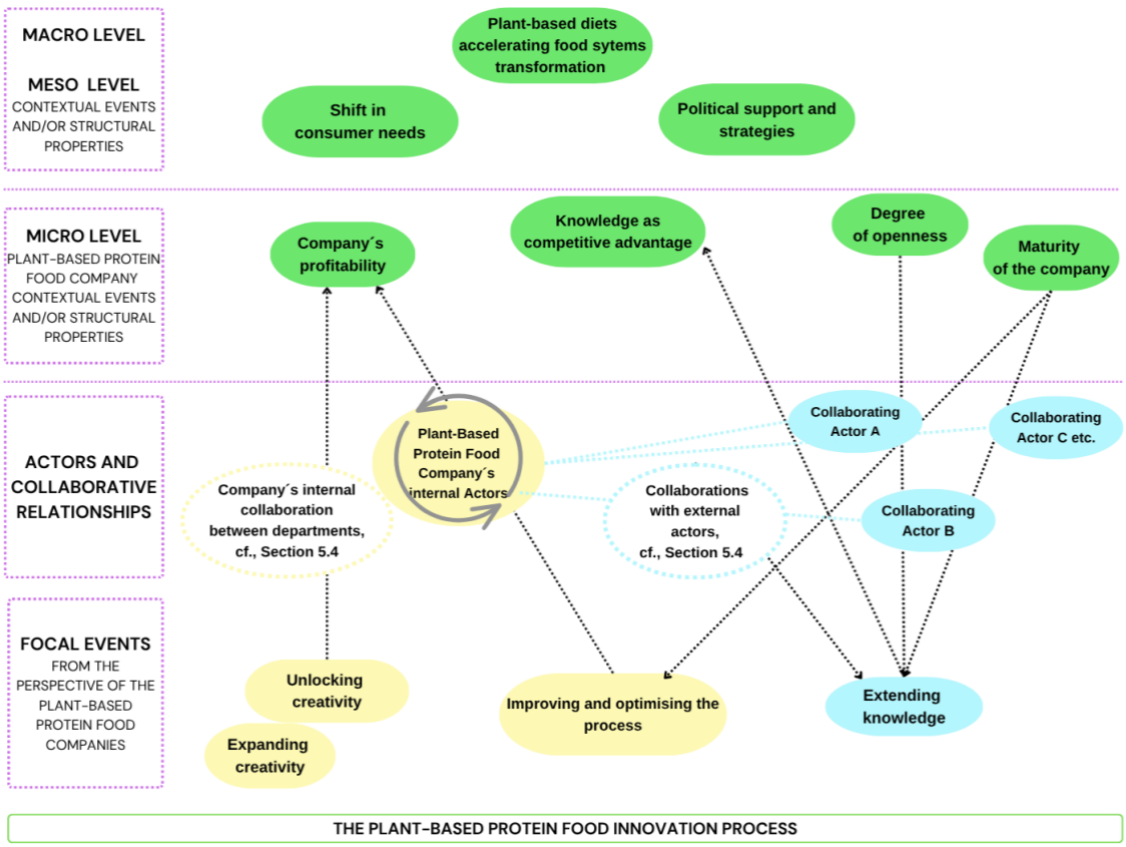


Figure 5.1 Focal events and contextual understanding of the plant-based protein food innovation process adapted from Makkonen, Aarikka and Olkonnen (2012) (own illustration)

The following subsection begins by outlining the primary characteristics of the innovation process along the focal and contextual events unfold.

5.3.1 Process characteristics

Process with sequential phases

The innovation process consists of sequential phases, as illustrated in Figure 5.2. The process includes the sequential phases of ideation, idea selection, concept/prototyping, development, development/upscaling, industrial scaling, and commercialisation, reconstructed from the researcher´s restoryings. Each phase in the figure is likely represented by a distinct box, with orange arrows indicating the progression from one stage to the next, and backward arrows specifying the iterative flows.

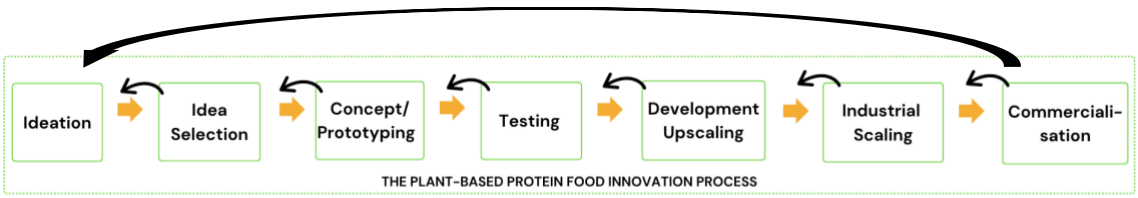


Figure 5.2 The plant-based protein food innovation process with sequential phases reconstructed and synthesised from the findings of the intra-story analysis (own illustration)

Critical phase of industrial scaling

Industrial scaling is one of the most critical phases of plant-based protein innovation processes. Narrator V asserted that this constitutes a *"neuralgic point"* in the innovation process. This is particularly relevant for startups in the plant-based protein food sector, which lack proprietary production capacities, making collaboration essential during this phase of development. Narrator C elaborated:

> *"So, we can as well like combine the sources and to see how to scale up something that for us might be super small because that's the difficulty that I believe, it's no longer that's problematic, but within the new technologies, it's always the scaling up, that the most difficult part."*

This statement underlines the assertion of narrator V in context of technology.

Consumer demand driven innovation process

The plant-based protein food innovation process is driven by consumer demands. The innovation processes of W, F, and Cs are inspired by the consumer-centred Design-Thinking approach, confirmed by the strong involvement and proximity to consumers and B2B customers in the initial phases of the process.

Agile, flexible and hands-on innovation process of startups

Plant-based protein food startup narrators described the innovation process with terms like "*agile*" and "*flexible*" to "*hands-on*", typical characteristics for companies in the early stages. P. argued, "*Other companies approach projects with fixed tasks, here it's a matter of trial and error.*". The terms "*agile*" and "f*lexible*" mean that adaptation can happen after any process phase, even after the final commercialisation phase. Narrator W elaborated:

> "*We have such an agile approach that when we generate learnings from the retail presentation, we incorporate them into the product. So it may be that a product goes back into the adaptation phase only shortly after the commercial launch phase.*"

Furthermore, L's company´s innovation process is an example of agility and flexibility, as L reverses the phase sequence by allowing the commercialisation phase to follow directly after the ideation phase. The subsequent phases are outsourced to the collaborating company to increase the efficiency of the process and lower economic risk, as outlined in this chapter.

Dominance of product and process innovation

The inter-story analysis of narratives reveals that the outcome of the plant-based protein food innovation process usually results in product and process innovation. These include minor innovations such as extending existing product lines with new flavours or enhancing taste and texture, which are the key product benefits appreciated by consumers. Nevertheless, companies are challenged to enter the second generation of plant-based protein food innovation owing to the rising demands of flexitarians. This involves offering cleaner product recipes with fewer ingredients or improved textures,

such as mimicking whole-cut animal meat. Companies such as those represented by Narrators F, A, and C are actively exploring new technological processes and alternative protein sources to reach the next stage of development. However, this path may also present a tension between a research and technology focus and a consumer-driven innovation process. Narrator C vividly illustrated this tension by stating: "*We're producing food for people, not for robots*."

After outlining the key characteristics that define the innovation process in plant-based protein food companies, the following sections delve into the focal events that shape this process from within and the contextual forces that influence it from the outside.

5.3.2 Focal events

Unlocking and expanding creativity

Supported by Narrators T, O, C, P, L, H, W, and A (Sections 4.2.7, 4.2.12, 4.2.10, 4.2.3, 4.2.11, 4.2.4, 4.2.1, 4.2.6)

The facilitation and expansion of creativity throughout all process phases are crucial for achieving innovative and disruptive outcomes in the innovation process. Plant-based protein food companies unlock creativity through employees´ internal engagement and their willingness to experiment. While Narrators T and O emphasised the creativity of their R&D teams, Narrator O highlighted:

> *"I would say that we take a very playful approach to product development. We have people (…) who have been vegan (…) for years, and I think they are simply trying out ideas with playful creativity. Sometimes a little naive, sometimes a little too unpretentious, but I think with results that are worth seeing."*

Narrators C and O confirmed that an open corporate and management culture, with a constructive approach to making mistakes, is needed to engage employees to experiment. Narrator P argued, "*Other companies approach projects with fixed tasks. Here, it's a matter of trial and error."* The Narrator L confirmed that a startup must be allowed to make mistakes to develop further. The personal conviction of employees,

particularly those in R&D who adhere to a vegan diet, serves as an additional motivation for experimentation, as shown in the narrations of O, H and T.

Internal collaboration between teams and departments supports the unlocking of company employees' creativity. Furthermore, collaboration with external actors expands creativity and knowledge. Narrator T indicated that the company's R&D had not previously collaborated with external academic partners; however, the company expressed openness to networking and establishing connections.

Narrator W, A and T mentioned *"stakeholder involvement"* and *"open inspiration"*. Narrator T elaborated:

> *"It's really important to have networks like this. Constantly looking around to see what's happening where and how and getting input from the outside. The worst thing we can do is to use the term bubble, which has been used so often now. So, if you are just inside it, simmering in your own soup and not looking at what else is going on, that's something you should avoid."*

Furthermore, Narrator W explained:

> *"We always use the NIHITO principle, ´Nothing important happens inside the office`, and as we naturally spend a lot of our time there, we want to have as much fresh input from outside as possible. This means that in addition to an internal pool of ideas that we have and maintain, we also have external sources."*

Narrator C. expressed it like this: "*How could we use our knowledge, as well as be inspired (…) by others".* Narrator C elaborated:

> **"***First off, the reason for doing the collaboration is to unlock the potential and unlock the opportunities. If it is visible that we are missing some capabilities, we are missing some resources, or we are missing some knowledge, then there is absolute space for collaboration rather than pretending we can do this by ourselves. It is a space (…) for collaboration, bringing completely different points of view to the internal environment and new inspirations. I believe someone from*

the outside might see things through a different lens (…) and does not have the same view or the same barriers as, for example, us."

Improving and optimising the innovation process

Supported by Narrators P, Z, K, F, C, and O (Sections 4.4, 4.9, 4.10, 4.3, 4.11, 4.7, 4.13)

Moreover, the findings reveal that plant-based protein food companies need to optimise their innovation processes and establish a systematic approach to enhance efficiency and expedite time-to-market for innovations. An efficient process is required, as pointed out by Narrator P´s understanding of the limitations of human resource capacities. Narrator Z emphasises the importance of efficiently planning the human and time resources of individual employees or the entire team within the company's innovation process.

Plant-based protein food startups, as well as the more mature companies, insource experienced managers to structure the process and organise it efficiently, as in the Narrator K, F, and C cases. Additionally, Narrator A pointed out the importance of employees' expertise. Narrator Z highlighted:

"Of course, (stage gates) really help to structure these (collaboration) processes and understand what you know. Okay, this is where the project started, and I have to carry it out. If you don't have anything, then you have to somehow find your way around a bit and have to gather everything yourself, but I think it's really helpful if a good project manager or innovation manager also has a process that is a blueprint like this."

This statement summarises the need for structure and good project management in Z´s company innovation process

Narrator A also highlights the importance of the innovation project lead. A named the lead *"The interface".* Furthermore, plant-based protein food companies utilise various process management tools to enhance their operational efficiency. These include structured team and steering meetings, as well as startup management tools such as OKR- and Lean Management (Narrators F and K), as well as funnel and stage gate

management processes (Narrators O and Z). Overall, the narrator mentions a risk of losing agility.

Contextual understanding through themes identified at the Micro level of the plant-based protein food innovation process is elucidated in the following section.

5.3.3 Contextual understanding at the Micro level

Focus on company´s profitability

Balancing a creative and agile approach while optimising procedures to boost the efficiency of plant-based protein food innovation processes is crucial for enhancing company profitability. This profitability is vital for reinvesting in innovative processes and technology and is financially attractive to investors.

Narrators L and Z pointed out the tension between a company´s profitability and sustainability objectives. Narrator L elaborated: "In *the end, it's always about profitability, sustainability is the enabler*". Narrator Z elaborated a similar point of view:

> "*The first priority for startup companies is simply profitability. That's just the way it is, it's a great pity because a lot is likely to fall by the wayside and in second and third place there's this legal framework and the demand from the target group. And then in fourth place it's innovation in the sense of contributing to sustainability. We can use it to make veganism more widespread; it's simply our vision and mission that goes hand in hand with it*."

Influence of company´s maturity

Supported by Narrators F, A, P, K, O, and T (Sections 4.2.2, 4.2.6, 4.2.3, 4.2.9, 4.2.12, 4.2.7)

The maturity of plant-based protein food companies and their level of internal knowledge and expertise influence their degree of openness and dependence on collaboration during the development and scaling phases.

Plant-based protein food startup companies require external collaboration and strategic partnerships to expand their knowledge and resources, particularly in the development and scaling phases. Narrator F explained," *(…), we really need to rely on collaborations*

and having a strategic partner to work with." Conversely, Narrator A presumed that A´s startup company´s R&D department possessed sufficient expertise, rendering external collaboration unnecessary. However, Narrator A contends:

> *"When one states: 'I lack knowledge of this process, yet I perceive the possibility', then it is evident that one is deficient in comprehensive technological understanding. Development (…) is an entirely distinct matter. Consequently, (…); if one identifies an economic benefit and can accomplish it with necessary external partners, then indeed, the situation is different."*

The more established plant-based protein companies within the vegan organic sector, represented by the companies of Narrators P, K, O, and T, have already developed their production capacities. These organisations engage in co-manufacturing and co-development within the innovation process when they are unable to implement certain manufacturing processes for innovations with their own production requirements, as in case of O.

Knowledge as competitive advantage
Supported by Narrators F, C, Z, and A (Sections 4.2.2, 4.2.10, 4.2.8, 4.2.6)
Technological process expertise and deep knowledge about plant-based raw material are revealed as key sources of competitive advantage across the narratives of F, C, Z, and A. Narrator A emphasised the strategic importance of technical know-how, by stating:

> *"A technical story is very difficult to understand as an outsider. From my point of view, this is incredibly important because, in the end, it makes the difference as to whether you produce a better product than your direct competitor."*

The sentiment is echoed by Narrator F, who described the company´s R&D-led innovation process as central to its market positioning. Consequently, the urgency to extend this specific knowledge to gain a competitive advantage serves as a primary motivation for most plant-based protein food companies to engage in external collaboration. F noted that the company relies heavily on collaboration with academic institutions to compensate for the lack of in-house technological infrastructure.

Narrator C offered a complementary perspective, focusing on the integration of consumer insights into technological development. C emphasised the importance of aligning product features (such as taste, texture, and nutritional profile) with consumer expectations, while also managing the complexity of process technologies. C stated: "The technology is only a supporting element". Narrator Z added a fast-paced market-driven dimension to this theme; Z´s company operates in a highly responsive innovation environment. Therefore, Narrator Z´s company conducts intensive research into raw materials and trends. However, they share as much information as necessary, especially when working with external partners, which leads to the next theme of openness to a certain degree.

Openness to a certain degree

There is a general willingness in the plant-based protein food innovation process to extend knowledge and expand creativity through collaboration. While knowledge is a critical asset, the narratives also reveal a nuanced approach to openness and collaboration. However, this openness is often strategically limited to proprietary knowledge in order to maintain a competitive advantage. Narrator W described this balance as the "*willingness to show the cards a bit".* Similarly, Narrator Z highlighted the use of non-disclosure-agreements (NDAs) and selective information sharing in co-creation projects: *"(We) only share as much information as necessary."* As the process becomes more technology-research-driven, the fear of losing competitive advantage increases, and thus greater protection of knowledge is implemented. Narrators F and C acknowledged that while external expertise is essential, particularly in development and scaling, there is a growing need to protect internal knowledge. F emphasised the importance of structured innovation management tools to maintain control over the process, while C pointed out the need to clearly define which capabilities are developed internally and which require external support.

5.3.4 Contextual understanding at the Meso and Macro level

The contextual understanding at the Meso and Macro level dynamics in the plant-based protein food innovation process is primarily informed by macro narratives derived from conference and workshop documentation, as detailed in the methodology chapter. All 12 narrators in this study engage with broader societal and sector-driven forces in their own company contexts reflected in their individual narratives. These themes are presented in the following paragraphs.

Plant-based diets accelerating food systems transformation
Supported by notes from events A and C (see Table 3.2*)*

The analysed macro narratives, as well as the background section of this study, highlight the transformation of the food system through greater sustainability and health requirements. The food sector has a significant environmental impact, by causing approximately one-third of the GGG emissions. This negative impact is attributed to animal-based protein production, particularly in meat and dairy industries. Researchers from the EAT-Lancet Commission have highlighted that adopting more plant-based diets can address sustainability issues in the food system and improve consumer health. Narratives from Event A attributed the planetary health diet concept as a *"(food system) transformation accelerator"*. Moreover, the increased popularity of plant-based diets has led to a decrease in the consumption of animal protein foods and an increase in the demand for plant-based protein foods.

Shift in consumer demands towards plant-based protein food alternatives
Supported by notes from events B and E (see Table 3.2*)*

Macro narratives reveal that the growing adoption of plant-based diets, particularly the expansion from strictly vegan and vegetarian target groups to a broader demographic following a flexitarian diet, has significantly influenced consumer expectations for plant-based protein food alternatives. Initially, these products were primarily targeted at vegans. For this target group, ethical reasons for eating animal-free products are vital. The emergence of flexitarian consumers has shifted the focus toward products that closely imitate meat or dairy products, particularly in terms of flavour and texture. The shift in consumer preferences necessitates innovation within the sector, to meet these

changing demands. This is referred to as a second-generation plant-based protein food innovation. This shift and its implications are particularly well illustrated through A´s and T´s narrations. In particular, T´s narrative provides a vivid example of how evolving consumer demand has shaped innovation strategies. T's company has been active in the market since the early stages of the plant-based protein category and has adapted its innovation approach accordingly.

Moreover, Narrator T argued that plant-based protein innovations and improved product quality can help more consumers incorporate plant-based foods into their daily diets, leading indirectly to a food system transformation towards sustainability. Narrator T stated:

> *"(…) all of us who work for this company are already big fans of plant-based nutrition becoming a bigger part of people's diets, because (…) we're all keen on animal welfare, that's one thing. And we also believe that climate protection will only actually be realised with it. So, in this respect, we have an indirect political agenda and the better the product is, the easier it will be to push this whole thing through."*

Lack of political support and strategies
Supported by notes from events B, C and E (see Table 3.2)

Furthermore, the findings indicate a lack of a cohesive vision and political framework at country level to effectively drive the transformation of the food system towards plant-based proteins. Macro narratives reveal that politically driven investments in local food value chains to strengthen the plant-based food sector are missing. Additionally, the sector calls for a political strategy for tax regulation to support price parity between plant- and animal-based proteins, making sustainable options more accessible to a broader consumer base. However, these efforts are often hindered by the political lobbying of established meat and dairy food industry stakeholders, which slows the regulatory progress. Moreover, the macro narratives underscore the need for greater political support in the field of novel food regulation. This is particularly the case for the facilitation of new process technologies and alternative protein resources, as additionally presented in the business context section of this study.

Based on the findings on process characteristics, focal and contextual events, and their interconnectedness, the subsequent section details the findings on internal and external collaboration and their roles in the innovation process (see Figure *5.1*).

5.4 ACTORS AND COLLABORATIVE RELATIONSHIPS IN THE PLANT-BASED PROTEIN FOOD INNOVATION PROCESS

This section synthesises the findings of the intra-story analysis of actors and relationships in the plant-based protein food sector in response to RQ 2. Figure *5.1* highlights the importance of internal and external collaboration as integral components of the innovation process.

The subsequent subsection outlines the findings on internal collaboration. Further subsections dive into external collaboration with the network, detailing actors, relationships, enablers, and barriers to external collaboration.

5.4.1 Internal actors and collaborative relationships

Employee and departmental engagement
Supported by Narrators F, W, T, and H (Sections 4.2.2, 4.2.1, 4.2.7, 4.2.4)
Internal collaborative relationships are powerful in unlocking creativity and extending internal knowledge during the innovation process in plant-based protein food companies. Figure *5.3* is a synthesis of the individual maps of actors in the previous chapter. Most of these maps, along with the restoryings, reveal an agile internal engagement of employees and departments, such as R&D, marketing/product management, sales and operations in the plant-based protein food innovation process, including interrelations between most of the company´s departments. Narrator F narrated that "*everyone is involved"* in F´s company innovation process. Narrator W highlighted the "*team spirit*". *T described a "democratic innovation process".* H spoke of all managers, even the CEO, to be involved and responsible in the innovation process.

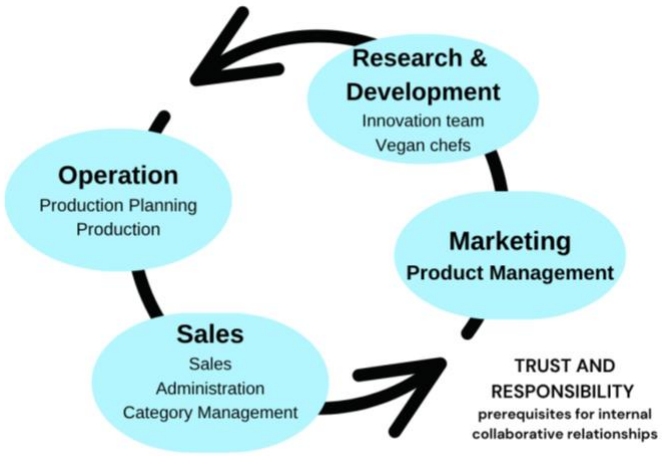


Figure 5.3 Company´s internal engagement of employees and departments (own illustration)

Most founders and managing directors of the plant-based protein food companies predominantly have a gatekeeping role throughout the innovation process or inspire in the ideation phase. T talked about the *"pre-taster"* function of the founder.

An exception is observed in V´s company which, due to its early developmental stage, relies entirely on external collaboration by insourcing the necessary departmental expertise.

Trust and responsibility

The establishment of trust and the allocation of responsibility to employees are requisites for facilitating internal collaborative relationships. O´s narrative is a lively example of this. Moreover, Narrator A highlighted that *"the biggest challenges are communication and coordination between the departments"* throughout the process. Narrator K underlines this quote by stating that communication between departments is of central importance. Narrator C added the need of identifying and overcoming possible *"unspoken barriers*". Therefore, innovation project leads have a crucial *"interface"* function and require people management as an essential component of project management skills.

Building on internal collaboration, the following section explores external actors and relationships.

5.4.2 Collaboration with the network: External actors and collaborative relationships

The researcher synthesised external actors and relationships from the individual maps of actors within a network surrounding the food value chain and a horizontal collaboration axis, as illustrated in Figure *5.4*.

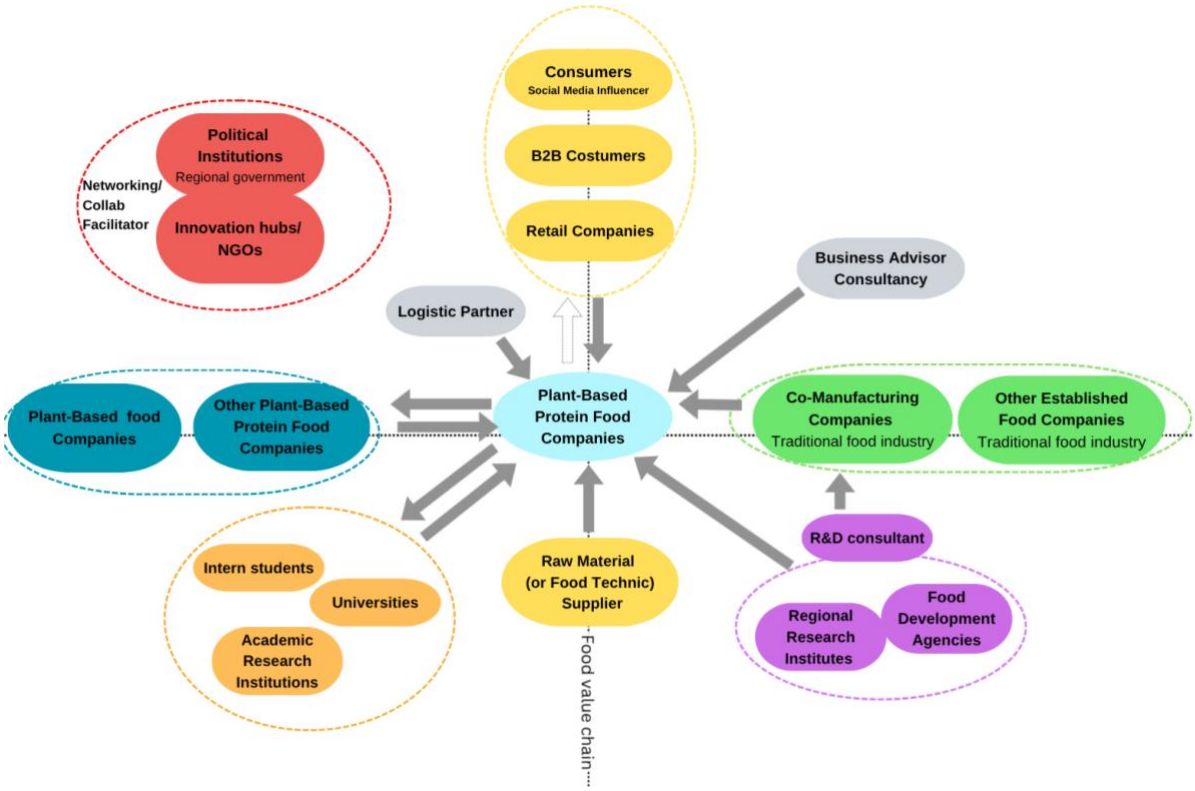


Figure 5.4 The network of external actors and collaborative relationships in the plant-based protein food innovation process (own illustration)

Moreover, Figure *5.4* categorises the key actors involved in the innovation process along the food value chain, distinguishing between raw material/food technology suppliers, retail companies, and consumer/B2B customers. In addition, the researcher further differentiated actors and collaborative relationships along the horizontal axis, identifying those from the plant-based sector, traditional food industry, and other relevant network actors. This includes actors such as academic research institutes, innovation hubs, and nongovernmental organisations (NGOs), who are also positioned within the broader innovation network.

The subsequent sections elaborate on the nature of these relationships and the collaboration models employed by plant-based protein food companies, with particular attention paid to how these interactions align with and support different phases of the innovation process.

5.4.3 Actors and collaborative relationships along the food value chain

Raw material/ Food technology supplier (Inflow of knowledge)

Access to knowledge about novel protein sources and innovative technologies for their modification represents a competitive advantage for plant-based protein food companies. Beyond their primary role in supplying ingredients and technologies, raw material providers also function as important conduits for new knowledge. Narrator V exemplified this knowledge source role:

> *"(…), where there is also a significant paradigm shift, particularly in connection with the supply chain. Due to the Due Diligence Act and the issue of sustainability, it is important to exchange directly with suppliers rather than negotiators. This involves engaging with those who actually provide the plant-based raw materials and thus possess considerable prior knowledge."*

Suppliers are also active in facilitating networking events and knowledge exchanges in the plant-based protein food sector, as reported by Narrator K. These actors play an essential role in the development and scaling phases.

Retail companies (Inflow of knowledge and co-creation)

Retail companies are actively engaged in the plant-based protein food innovation process during the commercialisation phase, as well as in the ideation phase and iterative adaptation. Retail companies contribute ideas, provide feedback for adaptation, and participate in co-creation initiatives, such as those narrated by Narrators O, K, T, and W. W's company frequently organises workshops with retailers. Narrator W explained:

> *"This means that we also regularly organise workshops with retailers on site, where a central buyer spends a whole day in (our company) in product*

development and talks to us about concepts that are perhaps not actually in the presentation phase but also brings his input back into the ideation phase."

Consumers/ B2B customers (Inflow of knowledge and co-creation)
Supported by Narrators W, F, T, and Z (Sections 4.2.1, 4.2.2, 4.2.7, 4.2.8)

The participants´ narratives revealed the proximity and participation of consumers and B2B customers, such as chefs, in the ideation and idea selection phases, as well as in iterative testing and adaptation. Narrator W called the company´s consumer pool *"family and friends",* which underlines their closeness to W´s company. Narrator F mentioned proximity to consumers and B2B customers as the key element in F´s company´s innovation process. Reminiscent of a Design Thinking approach, consumers and B2B customers test prototypes of product ideas and provide direct feedback. Furthermore, F emphasised that the company is "*open to adapting*" to consumer/customer feedback. The feedback of B2B customers, such as chefs, also plays an essential role in adaptation in narrator P´s innovation process.

Furthermore, the more established plant-based food companies, such as Narrator T's company, emphasised the importance of maintaining a close relationship with consumers to meet changing consumer demands. In addition, even social media influencers have an external decision-making and gatekeeping function in Narrator Z's company.

5.4.4 Actors and horizontal collaborative relationships between food companies

Plant-based food companies (Inflow and outflow of knowledge, co-branding and co-creation)
Supported by Narrators H, K, P, W, and C (Sections 4.2.4, 4.2.9, 4.2.3, 4.2.1, 4.2.10)

An exchange of knowledge exists between plant-based protein food companies, particularly at trade fairs, with notable openness in the organic sector. Narrator H characterised the organic sector in general as less competition-driven and more inclined towards openness. Other narrators of organic companies support this view, such as the founder of Narrator K's company, who actively mentors startups within the sector.

Furthermore, Narrator P highlighted general openness and willingness to collaborate across the plant-based protein food sector. P attributes this to the shared recognition of the challenges involved in independently establishing a company within this sector. P. stated, *"there is enough space for every company in this market sector".* P perceived *"the degree of competitiveness is lower than normal in the private market economy".*

Narrator W provided an illustrative example wherein plant-based protein food companies collaborated in the ideation phase by selling their product recipes (formulations) or product ideas to W's company because of the lack of their own development and production capacities.

By contrast, Narrator C underscores the delicate balance involved in horizontal collaboration, particularly when business interests are at stake. C stated:

> *"You know, it's like, at the end, everybody's fighting for the same consumer. So, I personally believe that (…) we will think about something, but it is always a conflict of business at the end. Therefore, at least for us, yes, that might be like there's a collaboration with other companies, who are more like producing the plant-based food, but not the ones who want to build the brand around the plant-based foods. Thus, they are the right competitors. So, it is a very fine line."*

Other companies outside of the plant-based food sector collaborate with plant-based protein food companies either through co-branding, such as seen in Narrator Z´s company´s case in the restorying, or through co-creation, as illustrated by Narrator P´s experience in scaling innovative ideas. Narrator P´s company joined the development of a plant-based protein food product, started by another small local company. Narrator P characterised this as a *"learning by doing"* adaptation. Crucially, P´s small local company needed to be open to co-creation, which involved a willingness to experiment and share its development knowledge in the adaptation phase.

Traditional food industry companies (Co-manufacturing and inflow of knowledge)
Illustrated by Narrators H, V, A, C (Sections 4.2.4, 4.2.5, 4.2.6, 4.2.10)

Plant-based protein food startups, without their own production capabilities, such as Narrators H, V, A, and Cs companies, need to rely on co-manufacturing with companies outside the traditional food industry, primarily established SMEs in the meat and dairy food industry. These collaborations are essential for scaling innovations beyond startup test kitchens for industrial production. However, such partnerships present challenges as they require close collaboration between R&D departments to adapt innovation prototypes and recipes for scalable manufacturing.

Compared with the role of raw material suppliers, other traditional food companies can also serve as a source of knowledge for plant-based protein food companies. Narrator K illustrated this by explaining K´s company´s initial process technology, and its current development and production process, emerged through the exchange and adoption of knowledge with companies from other food sectors.

Moreover, the findings revealed challenges in the collaboration and management capabilities between plant-based protein food companies and companies from the traditional industry sector. These issues are outlined in subsequent sections.

5.4.5 Other actors and collaborative relationships

Universities and academic research institutes (Co-creation of knowledge)

Collaboration between plant-based protein food companies and external research organisations has created new knowledge. Narrator C elucidated that their company's R&D team focuses on existing technology utilising in-house resources, while a separate R&D team concentrates on exploring novel innovative technological possibilities in collaboration with external research organisations.

Moreover, academic, public, and non-academic research organisations support plant-based protein food companies in the development and upscaling phase with technological facilities. Narrator F´s company needs to rely on the resources of university food technology departments or research institutes because the company

lacks its own laboratory resources in the development and upscaling phases of the innovation process.

Intern students (Inflow of knowledge)

In Narrator K and L´s cases, external relationships with intern students and plant-based protein food companies represent an additional workforce and the introduction of new knowledge into the plant-based protein food organisation, as well as a career opportunity for the students. Moreover, it also facilitates the establishment of closer relationships with related universities. Additionally, Narrator W reported that W´s company managers offer lectures and mentoring for student innovation hubs and startup projects, which also enriches the company itself.

Findings indicate that intern students are primarily employed in the Marketing and R&D departments and participate in innovation processes from ideation to development phases.

External advisors (Inflow of knowledge)

In the early stages of development, plant-based protein food companies benefit significantly from the expertise of external advisors, who help leverage business operations and professionalise internal processes, as confirmed by Narrator F. F elaborated, *"(…) trying to harmonise, trying to see everything from the helicopter view and focus on the right things. It takes some experience, of course."* Narrator H further supported this view, noting that such advisors also facilitate collaboration. Their contributions are widely accepted by all collaboration partners involved in the plant-based protein food innovation process, as exemplified by the collaboration between Narrator H´s company and its co-manufacturing partner.

5.4.6 Actors who facilitate collaborative relationships and networking

Innovation Hubs

Innovation hubs and NGOs, which are often politically supported and implemented, facilitate networking in the plant-based protein food innovation process. These organisations create the framework for the networking activities of potential collaboration partners. They facilitate the transfer of knowledge within the sector and offer technical equipment and facilities for the development and upscaling phases to startups, as Narrators W, F and K revealed.

Political institutions

Political institutions play a significant role in supporting plant-based protein innovation processes through legislative frameworks and funding collaborative projects. For example, through funded collaborative plant-based protein innovation projects, actors in the plant-based protein sector are brought together, including academia, plant-based protein food companies, suppliers along the value chain, and other food organisations, in order to foster innovation, as in Ps and F´s company cases. Additionally, Narrator F highlighted the importance of politically supported research grants and funding schemes. These often require partnerships with academic institutes to support company-led innovation projects.

Finally, in addition to these subsections on external actors and collaborative relationships, the Table 5.2 summarises findings on actor types, identified collaboration models, involved innovation phases, and example narrators.

After having detailed the findings on actors and relationships of internal and external collaboration, as well as collaboration models, the subsequent section presents cross-narrative insights into the factors that facilitate or hinder external collaboration.

Table 5.2 Summary of external actor types, collaboration models, involved innovation phases in the plant-based protein food innovation process (own illustration)

Actor Type	Collaboration model	Innovation Phase Involved	Example Narrators
Raw material or food technology suppliers	Inflow of knowledge	Development, Scaling	V, K
Retail companies	Co-creation, Feedback	Ideation, Commercialisation	O, K, T, W
Consumers and B2B customers	Inflow of knowledge	Ideation, Idea selection, Adaptation along the process	W, F, T, Z
Traditional food industry companies	Co-manufacturing/ Inflow of knowledge	Industrial Scaling	H, V, A, C
Plant-based food companies	Inflow and outflow of knowledge, Co-Branding and Co-creation	Concept / Prototyping	H, K, P, W, C
Universities and academic research institutions	Co-creation of Knowledge	Development, Upscaling	C, F
Intern students	Inflow of knowledge	Ideation to development	K, L, W
External advisors	Inflow of knowledge	Throughout the process/ development	F, H, W
Innovation Hubs	Collaboration facilitation		
Political institutions	Collaboration facilitation		

5.4.7 Enablers of collaboration

Shared vision for the future of food and sustainability
Supported by Narrators P, H, T, K, F, W, Z, and V (Subsections 4.2.3, 4.2.4, 4.2.7, 4.2.9,4.2.2, 4.2.2, 4.2.2, 4.2.1, 4.2.5)

Narrators P, H, and T confirm that collaboration partners in the plant-based protein organic food innovation process share a vision of the future of food and sustainability, which is inherently characteristic of the entire organic food sector. Narrator K referred

to this as *“intrinsic motivation*” of the sector’s companies and consequently serves as a catalyst for collaboration in the organic sector.

Furthermore, the findings reveal that plant-based protein food companies generally possess an understanding of a shared motivation to advance the transformation of the food system towards sustainability. Narrator P described that most of the plant-based protein food companies *“want to really change something and are willing to drive the protein transformation towards sustainability collaboratively”*. P further elaborated:

> *“Many founders who start something in this area say: I really want to change something, and I think this spirit makes you do things together and be much more open and just say to each other, look, let's support each other and go ahead together.”*

Narrator H's company's co-manufacturing partner from the meat sector, which has engaged in collaboration to create a more sustainable future for subsequent generations, illustrates a scenario where both collaborative partners adhere to the same vision. Narrator H stated the co-manufacturing company´s CE0´s “moral obligation” as follows:

> *"Hey, you know what, you may be a small light, but I see the potential. I also want to contribute a little because of my children, and we must get away from this excessive meat consumption, and this is a sausage and meat products manufacturer that makes a living from it.”*

Furthermore, Narrator *F explained, “I wish we could all have a more open innovation mindset because we're not alone in this.”* This is particularly applicable to young employees and managers such as in narrator W's company. W narrated that they were enthusiastic about collaboratively developing the future, making an impact, being meaningful, and affecting change, both internally and externally.

Additionally, Narrator Z's example of a dissolved collaboration underscores the importance of a shared vision among collaboration partners. Z elaborated:

"We (…) had to part ways with one (co-manufacturing company). Because we are a vegan company (…), there are hardly any co-manufacturing companies that are completely vegan in this area, and they tend to see profitability in non-vegan things. Thus, the motivation of these partners towards us is lower than that towards others. And then, of course, you realise that you are at a disadvantage and then the chemistry is no longer right and you part ways."

Furthermore, Narrator H was passionate about food and sustainability. Narrator W discussed this "*passion*" as the "*secret ingredient*" for collaborative innovation in the sector. Narrator V spoke of the entrepreneurial desire to make a difference and be socially recognised.

While a shared vision provides foundational motivation for collaboration, it is often the perception of mutual benefit that determines whether partnerships are pursued and sustained. The following theme explores how actors assess and align their interests in creating win-win scenarios.

Mutual benefits

The findings reveal that all actors in a collaboration should derive equitable benefits, thus, a possible collaboration should create a win-win scenario for all collaborating parties. This may involve advancing a shared vision of sustainability or addressing economic and academic interests. Narrator P pointed to the importance that "all *collaboration partners must see their benefits".* Narrator K added that benefits must be clearly stated from the start of a collaborative innovation project.

Narrator C illustrated cases of collaboration with academic institutes and co-manufacturers to complement and combine resources to achieve mutual benefits. C further illustrated that sustainability goals and economic interests are not mutually exclusive but can be aligned within collaborative partnerships. C elaborated:

"I think it could be the opportunity because for us as a company, it is our primary goal, our mission and vision. Our partners, (…) not only worked with us. They have their own goals, (…) missions, and vision. For them, (…) the primary goal is business. I imagine, but it´s not something I would say (out loud). However, it is a

matter of joining forces, which can only make us successful, right? But of course, it is a common understanding of both parties´ objectives and accepting the fact that if my goal is to have plant based as the new normal and to improve the planet, then you have a deal. We should not (…), kind of like, pretend that the business is not important (…). Business is the most important (…). Let's combine. Both can go together."

Moreover, Narrator Z shared an example of how to achieve mutual benefits in a horizontal collaboration of co-creation and co-branding between Z´s company and another plant-based protein food company. Both partners are independently successful entrepreneurs in their respective fields; it was important that the outcome of the collaboration was beneficial to both parties with each deriving equivalent advantages.

Beyond aligning interests, successful collaboration also depends on the quality of relationships. The next theme highlights the importance of trust, transparency, and perceived equality in fostering effective collaboration.

Equal footing and mutual trust

Supported by Narrators V, H, K, and C (Subsections 4.2.5, 4.2.4, 4.2.9, 4.2.10)

Equal footing is seen as one of the most crucial components for successful collaboration in the plant-based protein food innovation process, even if there is a dependency or unequalness in the sizes of the companies. Narrator V asserted:

"*Well, if I say that from the perspective of a medium-sized company. That (plant-based protein food) startups know that you can be approached and that it's not just an exchange of business cards and LinkedIn contacts and that there is also a real exchange of content (…) (on equal footing) and not this, yes, make us an offer and we'll look at it with interest and so on, but that you really meet (on equal footing)."*

Moreover, mutual trust precedes collaboration. Narrator H emphasised that the interpersonal dynamics among collaborating organisations must be compatible, illustrated by the quote *"the right chemistry between each party."* Furthermore, H added the component of transparency must be there from the start of the collaboration,

even in a dependent collaboration. H stated: *“If the larger partner or competitor wants to find out something, it's pretty easy with food products, so why not be open about it right from the start.” Furthermore,* narrator H pointed out*: „It’s all about people in business. People working together.”* Narrator K stated:

> *"And I think it's also a matter of trust, because the collaboration partners often have more know-how in the same area than we do. And then, of course, they can quickly play with our expectations, they say yes, this and that is feasible, and we can do it and maybe we can do it in two years. Sometimes, they are also very motivated at the beginning, but perhaps a little unrealistic and overconfident. This is the point of trust. They have to give us a few assurances that we can really rely on."*

In contrast, Narrator C elucidated “unspoken barriers” as an obstacle to mutual trust in a co-manufacturing relationship. Narrator C elaborated:

> “*We have our know-how and their developers have their know-how and sometimes it's like each of the parties try to keep the knowhow to themselves (…) that is a massive obstacle because until the moment we will understand we are working for the same goal, it is going to be always like that and honestly that's the biggest challenge for now. We are getting closer, but there is (…) something between, right? It is like an unspoken (…). It's very important (…) to establish the same goals and to really establish the collaboration that we're working for the same goal.”*

While structural trust and mutual respect are essential, personal attitudes and management styles also play critical roles in shaping collaborative innovation. The following theme addresses how personal commitment and effective management practices can act as enablers of collaboration:

Personal attitude and effective management

Moreover, manager’s personal attitudes and effective management enable successful collaboration in the plant-based protein food innovation process. These themes are outlined in the subsequent Section 0.

Despite the presence of strong enablers, collaboration in the plant-based protein food sector is challenging. The following section outlines the key barriers that can inhibit or complicate collaborative efforts, particularly for small or resource-constrained companies.

5.4.8 Barriers for collaboration

Company´s limited resources

Illustrated by Narrators P, K, Z, and O (Subsections 4.2.3, 4.2.9, 4.2.8 and 4.2.12)

A barrier to external collaboration for plant-based protein food innovation is the limited availability of company resources, such as human capital, time and financial assets, especially for small companies like those of Narrator P and K. Narrator Z elaborated the example that collaboration efforts with academic institutes finally failed to be realised despite their potential interest. The main barriers were the scarcity of Z´s company´s employee resources and the necessary establishment of processes for this purpose.

Narrator O and K elucidated limited financial resources as barriers for academic relationships. K stated:

> *"We've also had several inquiries, including from universities, where sometimes they have some kind of cool problem that they want to solve and want companies to get involved in. But of course, the universities always ask for money along the way and that's often just a very big investment for us, which would actually be required, so we're actually too small as a company, which is why we quickly fall away."*

Protection of and fear of losing knowledge

Several narrators expressed concern about the risks of sharing proprietary knowledge in the co-creation processes. As academic institutes requested to publish new knowledge, F's company wanted to protect the newly created knowledge to ensure its competitive advantage. Narrator F highlighted the tension between this academic openness and the need to protect competitive advantage. F stated: "*Publishing would benefit the category, enabling mutual learning (…) but it's tricky to find a way*." Similarly,

Narrator C described a "*fear of losing the knowledge, losing this uniqueness*," while Narrator O noted that companies are often more interested in "*taking than in giving*" within networks. These insights underscore the shared perception that transparency, although essential, is difficult to achieve when competitive stakes are high.

Narrator F elaborated: *"Indeed, publishing would benefit the category, enabling mutual learning."* F added: *"It is tricky to find a way*."

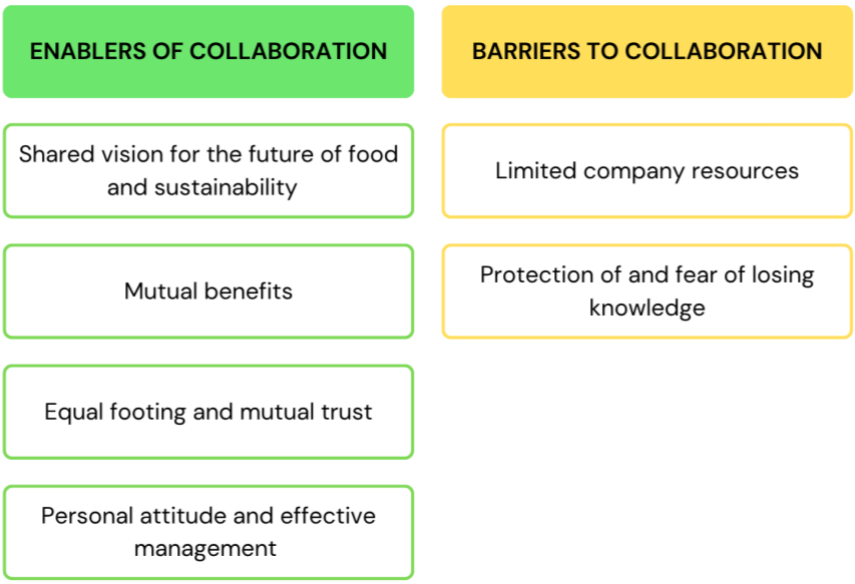


Figure 5.5 Enablers and barriers of external collaboration in the plant-based protein food innovation process (own illustration)

The identified enablers and barriers to external collaboration are summarised in Figure 5.5. While enablers and barriers shape the conditions for collaboration, the ability to navigate these dynamics effectively depends on the internal capabilities of the organisations involved. Therefore, the following section explores the innovation management capabilities that support and sustain the building of networks and collaborative relationships in the plant-based protein food sector.

5.5 CAPABILITIES FOR PLANT-BASED PROTEIN FOOD INNOVATION PROCESS MANAGEMENT

The development and maintenance of networks, along with the capabilities to manage collaborative relationships are core capabilities for the innovation process management in the plant-based protein food industry. Moreover, the researcher identified the cross-narrative themes of managers' personal attitudes, transformational leadership, entrepreneurial understanding, and knowledge management. Finally, the themes informed the construction of a conceptual framework for innovation management capabilities in response to RQ 3.

5.5.1 Management capabilities to build and maintain networks

A professional network and the establishment of relationships with potential collaboration partners constitute the foundation for successful collaboration in the plant-based protein food innovation process. This section elucidates the findings regarding the personal prerequisites and management skills required to establish and maintain network connections effectively.

Figure 5.6 Personal prerequisites and capabilities to build and maintain networks (own illustration)

The researcher identified themes of managers´ openness and mutual acceptance as crucial factors that enable them to connect with external actors and build relationships for potential collaboration (see Figure 5.6).

Manager's openness

Narrator T pointed to the personal willingness to open the innovation process, a sense of curiosity in general, as well as "*the ability to think outside the box",* which were also underlined by Narrator Ps and in H´s narrations. Narrator Z said in the same vein*:*

> *"(…) Simply have an interest in new things and (…) simply look over the horizon a bit. Even if ideas or ingredients at a trade fair (…) might not seem so cool or interesting at first sight, you should just take the time to listen to everything."*

Narrator L and C added interest in people, manager's authenticity, as well as *"willingness to learn"* as crucial for networking. C elaborated:

> *"(…), the most important in my opinion is (…) to simply be interested in people. (…). If you want to do (…) successful networking, it needs to be very open, very transparent, (…) very authentic. Of course, you can have the objective to build a very strong network (…), but it's going to be very artificial if you don't have this natural willingness to learn."*

Mutual acceptance

Moreover, Narrator C stated, "*Learn from people, let people learn from you*". T added to focus on mutual benefits rather than purely self-interest: "*Benefit for the other and not all for yourself*." These quotes highlight the relevance of mutual acceptance in openness. Additionally, narrators emphasised acceptance of diverse perspectives and engagement in interpersonal interactions. Narrator C outlined:

> "*And for me this acceptance of others is absolutely key because, like, everybody is different. Everybody has different backgrounds. Everybody has a different history (…). And that's part of working, simply to see what's there and accept whatever you have."*

Furthermore, micro narratives outline that networking generally necessitates a more agile approach, such as the willingness of managers to establish connections in a network, even when the immediate benefits are not obvious.

The narrators emphasised the importance of maintaining contact and sustaining one's network, both on digital platforms and physical events. Narrator W, P and H emphasised the necessity of a certain level of personal presence and the willingness to allocate time for such activities. Narrator P added, "*Maintaining your network is important but challenging to really do it."*

Furthermore, Narrator Z emphasis that it can be valuable to network, even if the benefits are not immediately visible. Z noted:

> *"To look at the possibilities and that you simply invest time and keep looking to get in touch with people and yes, even if a project doesn't materialise, you always say goodbye on good terms, let's say, or just stay in touch, because a lot of things come about through contact via third parties."*

5.5.2 Management capabilities for effective collaborative innovation

The themes of capabilities for effective innovation process management in the plant-based protein food industry were reconstructed in terms of personal attitudes and management capabilities. The findings inform the framework of capabilities for collaborative innovation process management in the plant-based protein food industry (see Figure *6.2*).

5.5.2.1 Managers´ personal attitudes

Managers´ personal attitudes comprise the themes of emotional and social competencies, as well as personal characteristics. Managers´ personal attitudes are effective for both internal and external collaboration in plant-based protein food innovation processes.

Emotional competencies

Narrators frequently emphasised emotional traits, such as passion, enthusiasm, and ambition. These qualities have been described as influential in shaping leadership and fostering collaboration. For example, Narrator H expressed strong passion for food and sustainability, an emotion echoed by the CEO of H's co-manufacturing company. Narrator W described "*passion*" as the "*secret ingredient*" for fostering collaborative innovation in the plant-based protein food sector. Narrator P calls it "*inspiration for the project",* by employees' responsibility, involvement and identification with projects, internally as well as in external collaboration. Narrator F pointed to the relationship between the company´s vision, mission and management style, *"I would say it is very important that we all believe in the vision and the mission, and this. of course, shapes our management style."*

Social competencies

Supported by Narrators H, V, F, W, L, A (Subsections 4.2.4, 4.2.5, 4.2.2, 4.2.1, 4.2.11, 4.2.6)

Narrators have described a range of social competencies essential for effective collaboration. These included openness to risk, trust building, and confidence in collaborations. For example, Narrator H highlighted sealing an agreement with a "handshake" and making "open book calculations", while Narrator H emphasised the importance of sharing "(...) things with a certain amount of trust". Narrators have also noted the importance of balancing perspectives and assertiveness. Narrator F discussed the need to harmonise differing viewpoints, while Narrators W and L emphasised assertiveness when necessary.

Narrator H elaborated on the development of social intuition:

> *"You simply have to develop a feeling for this by knowing people, working well together, sounding things out in advance and over the first months and years of working together. If that doesn't work and you have a bad gut feeling, then you have to put the brakes."*

Furthermore, Narrator A described the qualities of an effective innovation project manager, including agility, positivity, mutual support, and constructive communication:

> *"It is imperative to be agile, maintain a positive disposition, and particularly, provide mutual support. This entails the ability to accept criticism constructively and to implement it effectively. Moreover, proficient listening skills are essential."*

Personally based characteristics

These findings reveal the importance of credibility and authenticity in management. Narrators H, C, and L identified these traits as foundational for building trust and successfully managing relationships. Narrator W and H linked credibility to the ability to inspire respect and confidence among team members and collaborators. Narrator H. described the process of building trust through long-term engagement: "*You simply have to develop a feeling for this by knowing people, working well together, sounding things out in advance and over the first months and years of working together."*

Fairness has emerged as the key characteristic. Narrator W stated:

> "*We are not afraid to provide people with information because we have a very fair competitive attitude. That is what I am saying now and, first, we have great confidence in our own development team, so what they do is infinitely good. And they're incredibly clever and on the other hand we also have confidence in our partners."*

Empathy was frequently mentioned as a necessary trait for effective collaboration. Narrator P illustrates empathy by the phrase *"you have to be good with people",* while Narrator L elucidated understanding the network within the collaborating company, identifying key stakeholders to advance and support a project or innovation.

Finally, several narratives linked personal values with organisational vision and mission. Narrator F asserted: *"I would say it is very important that we all believe in the vision and the mission, and this shapes of course our management style."*

5.5.2.2 Transformational leadership

These findings indicate that transformational leadership plays a central role in enabling collaborative innovation processes within the plant-based protein food sector. Narrators described several leadership practices and values that support this approach. These include fostering employee growth and development, promoting transparency and openness, ensuring psychological safety, effectively managing internal stakeholder relationships effectively, and encouraging a sense of ownership and responsibility among employees.

Narrator T emphasised that the foundation of collaborative innovation must be established by the company´s leadership: *"So the framework conditions have to come from the company or from the company management, that you say you want to work accordingly."*

Narrator K highlighted the importance of long-term commitment and strategic prioritisation in leadership. K explained that collaborative innovation requires more than transactional engagement does. It demands sustained involvement and alignment with company´s long-term goals. Narrator K explained:

> *"It's not like I'm just going to say I'm going to buy a service at this price; it's always a bit open, firstly I need someone who's going to work on it for the long term, who's going to pursue it for the long term and who also has the time for the long term (…). It has to be very clear from our side that (…) we want this, and it will bring us added value and then I am also prepared to invest this time."*

Narrator O emphasised the importance of psychological safety as a critical enabler for internal creativity and innovation. Narrator O described the importance of empathetic leadership in creating an environment in which employees feel safe to express ideas freely. Narrator O stated:

> *"(…) that I lead and guide empathetically and instil trust, creating an environment in which all ideas can be expressed, regardless of how seemingly inappropriate they may initially appear. When engaging in creative work, there are no unfavourable ideas."*

Transformational leadership not only supports internal organisational dynamics but also enhances the organisation's ability to engage effectively with external actors in the innovation process.

5.5.2.3 Entrepreneurial Understanding

Narrators emphasised the importance of an entrepreneurial mindset in managing collaborative innovation processes. This includes the ability to effectively allocate and manage a company´s resources, such as human, time, and economic resources. Moreover, there is the capacity to define, shape, and align expectations and objectives across internal and external collaborating actors.

Narrators W and F referred to a *"mindset of thinking ahead"* as a key entrepreneurial trait. Narrator F elaborated on this by highlighting on maintaining a "*helicopter view",* which involves understanding the broader organisational context, including the interconnections between departments and the financial implications of management decisions.

Narrators L and O emphasised the role of expectation management in collaborative settings. They described how shaping and aligning expectations with collaborating partners is critical for maintaining momentum and ensuring mutual commitment throughout the collaborative innovation process.

Entrepreneurial understanding not only supports internal decision-making but also provides strategic foresight and resource awareness that underpin transformational leadership. For example, the *"helicopter view"* described by Narrator F reflects not only entrepreneurial insight but also the capacity to guide teams through complex innovation processes.

5.5.2.4 Knowledge Management

Supported by Narrators P, F, W, C, and H (Subsection 4.2.3, 4.2.2, 4.2.1, 4.2.9, 4.2.4)

Narrators highlight the significance of knowledge management capabilities in collaborative innovation processes. Narrators described how managers must actively

engage in the acquisition, integration, and application of knowledge across organisational boundaries.

Narrator P observed that effective collaboration depends on managers´ capabilities to network and that this relation facilitates knowledge exchange. Narrator F emphasised the value of internal expertise, noting that while external actors such as research institutions and co-manufacturers are important, internal knowledge remains a guiding force. F stated:

> "*(…) we also have the expertise in house, which is also very important, like we don't rely blindly on the research partner or on the co-manufacturing company. But we can guide this with our knowledge as well."*

Narrator W highlighted the need for *"single-mindedness to manage new knowledge",* suggesting that focus and clarity are essential when integrating novel insights into existing processes. Similarly, Narrator F pointed to the importance of *"ownership"* and *"responsibility"* in managing knowledge transactions in collaborative food innovation research projects, particularly in technology-driven innovation processes in the plant-based protein food sector.

Emotional and social competencies serve as foundational enablers for effective knowledge management. Managers who demonstrate empathy, trust-building, and openness are more likely to foster environments where knowledge is freely shared, co-created, and applied across organisational boundaries. As Narrator´s H emphasis on "handshake" collaboration and Narrator C´s call for "*acceptance of others*" suggest, interpersonal trust and emotional intelligence are prerequisites for the open exchange of knowledge that collaborative innovation demands.

The subsequent section illustrates the findings on how these capabilities manifest in practice through selected cases of collaboration between plant-based protein food startups and traditional food companies.

5.6 THE PERSPECTIVE OF THE TRADITIONAL FOOD INDUSTRY ON COLLABORATION IN THE PLANT-BASED PROTEIN FOOD INNOVATION PROCESS

This section focuses on insights into collaboration in the plant-based protein food innovation process and the required management capabilities from the perspective of the traditional food industry. The findings are derived from the inter-story analysis of the micro narratives collected through narrative interviews with narrators D and N from traditional German Mittelstand food companies that actively collaborate with plant-based protein food startups in co-creation (see Table 3.4), as well as macro narratives, primarily conference and workshop documentation. The findings presented in this section corroborate those of the analyses of the twelve micro narratives collected through narrative interviews with plant-based protein food startups and SMEs, which are presented in the previous sections.

Although the companies of Narrator D and N do not fall within the EU's SME definition (European Commission, 2020) by size and turnover. They are larger enterprises but retain the core values and governance structures of SMEs such as family ownership, lean governance structures and regional embeddedness. These attributes make them a suitable fit for the corroboration cases in this thesis.

Definition of the German Mittelstand

The term Mittelstand refers to a distinctive segment of the German economy, encompassing a broad range of small- and medium-sized enterprises (SMEs) as well as larger, family-owned firms that share specific structural and cultural characteristics. While not a legal category, the Mittelstand is widely recognised in academic and policy literature as a socio-economic model defined by qualitative attributes rather than quantitative thresholds (Welter, 2018; Becker et al., 2020).

Both Mittelstand companies from the traditional food industry are family owned and introduce an innovative range of plant-based protein food alternatives alongside their animal-based product assortments.

Traditional food companies become more agile

Narrator D observed that both collaboration partners derived advantages from the collaboration as the R&D resources of both companies complemented each other. Furthermore, the agility, flexibility, and creativity of the plant-based protein food company proved highly beneficial for D's organisation, while the plant-based protein company gained enhanced structure and maturity through collaboration.

The agility and speed of plant-based protein companies are also cited by Narrator N as distinct advantages of their collaboration that have accelerated the innovation process overall and benefit N´s company professional approach. N stated:

> "*We also learn an incredible amount from the startups. The way they do things impulsively and do not spend a lot of time thinking about what a problem could be (…). And this can-do attitude is what our company lacks."*

Narrator D emphasised that this also entails agreeing upon and managing diverse expectations within the collaborative innovation process.

Agreeing upon and managing diverse expectations

In D´s case, the plant-based protein food start-up operates with agility and expeditiously, as it is entrepreneurially compelled to rapidly achieve industrial scaling to secure financing. Conversely, D's organisation, as a medium-sized food company, operates in a more structured and reviewed manner with its resources, which delays the process from the perspective of the startup. Furthermore, plant-based protein food companies exhibit a more focused approach, whereas medium-sized food companies typically pursue multiple innovation ideas and opportunities concurrently, negating the necessity for such specialisation. Narrator D elaborated this in relation to the different corporate objectives of both partners

Sparring partnership, mutual acceptance and open knowledge exchange
Additionally supported by notes from event D (see Table 3.2*)*

In this context, Narrator N highlighted the importance of a sparring partnership approach, which entails mutual acceptance and facilitation of open knowledge exchange to support collaboration. Narrator N stated:

"*In the collaboration, we observed that it proceeded in a highly collegial manner. Specifically, the knowledge gaps of colleagues from the (collaborating plant-based food company) were complemented by our expertise, and conversely, their knowledge addressed our areas of uncertainty.*"

Acceptance in this context also encompasses the acknowledgement of potential errors that may occur during collaboration, while maintaining a willingness to collectively devise solutions.

Trust as an enabler for open communication
Additionally supported by notes from event D (see Table 3.2*)*

Furthermore, Narrator D points to trust as an enabler for open communication and collective solutions. Narrator D stated:

"At the end of the day, it always helps you talk to each other. We have provided many answers throughout the process. If there is a basis of trust, you have a good platform for dialog right from the start. If the basis of trust doesn't exist, then the project is at least difficult or perhaps even impossible to implement because there are too many stumbling blocks in the way."

Narrator D summarises the success factors in the statement: *"So, the main difference and success is the same. This is the way we deal with each other: trust, speed and quality of the concept. That should be there."*

Emotional bond
Additionally supported by notes from event D (see Table 3.2*)*

Narrator N affirmed the importance of a traditional food company to be willing to network and recognised its importance in identifying potential collaboration partners for the plant-based protein food innovation process. Trade fairs and events focusing on plant-based protein food are particularly suitable for initial in-person contact. Face-to-face meetings align with the importance of "*personal chemistry*" and effective communication ("*speaking the same language*"). N explained, *"It is essential to have an exceptional match to mutually advance one another."* Narrator D also emphasises the importance of this '*pre-collaboration phase'*. Based on Narrator D´s experience, it is

important to check whether a relationship makes sense to check the "*emotional ability to bond*". Authenticity is important to deal with it honestly.

Narrator D emphasised that curiosity plays a major role for successful networking, *"You just have to be curious to get different impulses in or search for a strategic partner".* Narrator D adds that innovation hubs play a catalytic role as facilitators of collaboration partners and knowledge.

Willingness to change and transformational leadership

Narrator N elucidated that N's organisation has realigned its corporate purpose to contribute to the transformation of the food system towards sustainability and health. As a traditional food company, Narrator N perceives this as securing the future of the company, adapting to changing values and dietary patterns, and addressing new target demographics. Therefore, this purpose serves as a significant catalyst for N's organisation to embrace innovation, change, and demonstrate openness in the innovation process. The company owner of Narrator N's organisation demonstrates personal commitment to the company's new purpose and, consequently, exhibits a willingness to initiate an open innovation process and engage in collaboration. N´s company CEO is prepared to undertake the inherent risks and disseminate this approach across all areas of the organisation.

Emotional and social competence

Additionally, N's narration pointed to equal footing and emotional competencies. N elaborated:

> *"Thus, it is imperative that the process be conducted in a collegial manner, on equal terms, and with a high degree of intimacy, as our experiences have demonstrated. Furthermore, each team member must possess an equivalent level of passion and enthusiasm for the product."*

In this context Narrator D highlighted the 'emotional competency':

> *"(...) the important competence, the emotional competence, how to manage a collaboration. Very, very, very crucial, because 60-70% of success comes from working from and with people."*

Effective project management

In addition to the importance of emotional competence, N also emphasised effective project management, reflecting entrepreneurial understanding, as a crucial success factor for successful collaboration, stating:

> *"(...) the framework conditions are that there is really good project management between the company and the startup from both sides, who are both really interested in it. Good project management that keeps pushing the whole thing forward, because the biggest obstacle is that time may be wasted at some point*."

Finally, Figure *5.7* summarises the identified themes and how they build on each other. Moreover, benefits for both collaborating parties are emphasised, such as startups becoming more structured, whereby traditional food companies profit from agility. Both companies benefit from resource enhancement.

Furthermore, the findings from Narrators D and N reflect the management capabilities themes outlined beforehand, particularly emotional and social competencies, openness, transformational leadership, and entrepreneurial understanding. Both cases also showed how knowledge was exchanged openly. These insights corroborate the relevance of the themes beyond the startup and sector context.

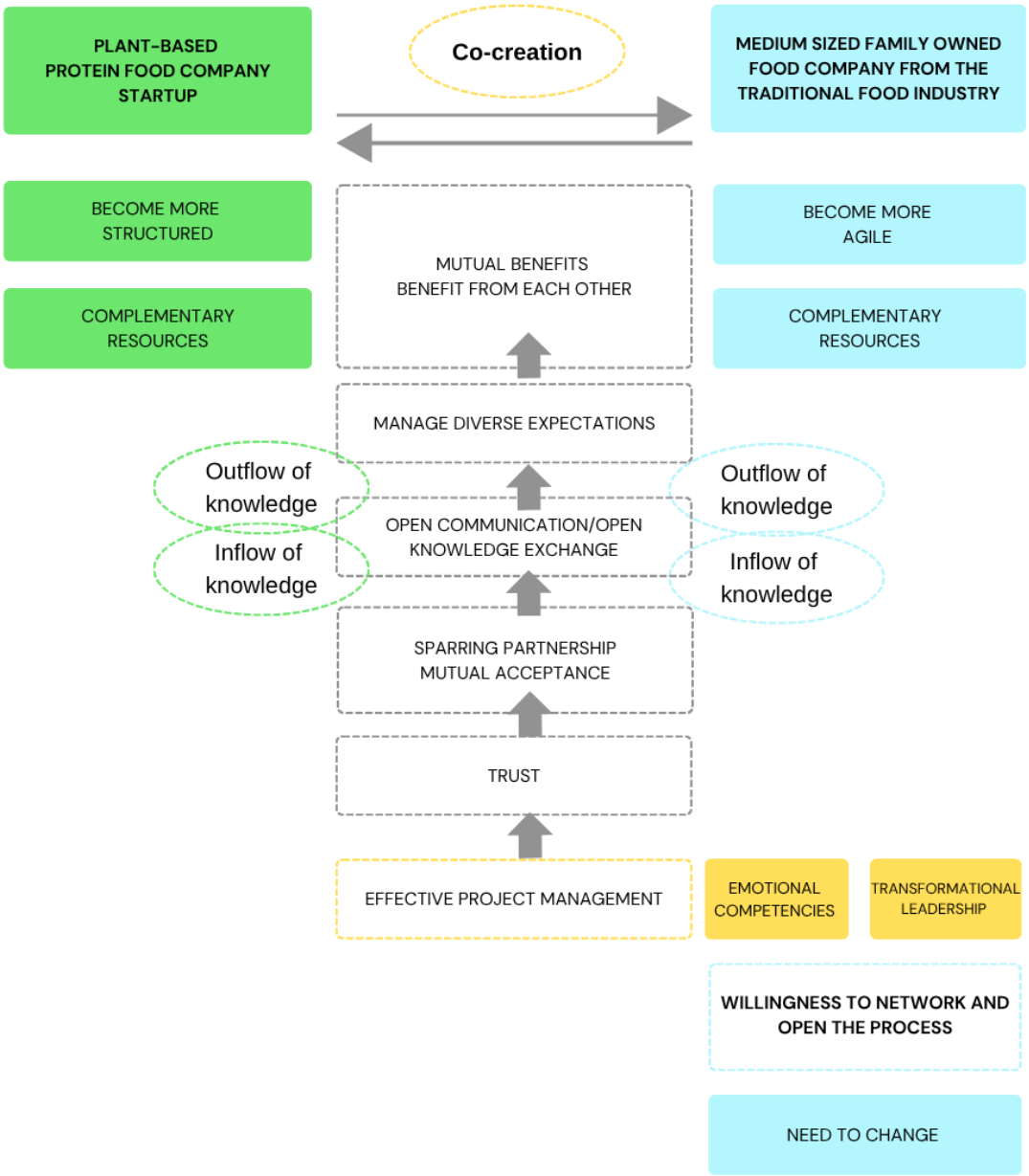


Figure 5.7 Collaboration-in-action in the plant-based protein food innovation process- narrated from the perspective of the traditional food industry (own illustration)

The subsequent section presents the concluding summary of this chapter, which comprises key findings on the innovation process, collaboration, and management capabilities for effective collaborative innovation in the plant-based protein food sector.

5.7 SUMMARY OF KEY FINDINGS

The section outlines the key findings of the two-phase analysis process in this study.

5.7.1 Key findings of the synthesised perception of the plant-based protein food innovation process

This study´s researcher derived themes relevant to the plant-based protein food innovation process from inter-story analysis of the micro narratives and researcher's restoryings and reconstructed them into a synthesised perception with the help of the meta-framework of dynamic network processes.

The plant-based protein food innovation process is characterised by sequential phases, from ideation to commercialisation. Across narratives, the process was described as agile and flexible, with companies adapting to various stages in response to market demand and technological changes. Product and process innovations are the most common outcomes, with a growing interest in more radical innovations involving novel technologies in response to the development of the second-generation plant-based protein food innovations.

Internally, contextual events such as company maturity, profitability focus, and technological expertise shape the innovation process. Externally, shifts in consumer demand and limited political support were identified from micro and macro narratives as influencing the process. Plant-based protein food companies have employed structured project management and collaborative strategies to enhance efficiency and creativity, which were identified as focal events driving the process.

Figure 5.8 summarises the key findings on the synthesised perception of the plant-based protein food innovation process to address RQ 1.

KEY FINDINGS ON THE SYNTHESISED PERCEPTION OF THE PLANT-BASED PROTEIN FOOD INNOVATION PROCESS	ADDRESSING
1. Consumer demand driven process, with a focus on agility and flexibility 2. Sequential phases from ideation to commercialisation, adaptation/iteration possible at any process stage 3. Predominance of product and process innovations 4. Creativity and efficiency are crucial factors for success 5. Expanding creativity and knowledge through internal and external collaboration 6. Challenges in balancing consumer demands with technological advancements 7. Optimisation and systematic approaches enhance efficiency and expedite time-to-market 8. Maturity of companies influences their openness to collaboration and dependence on external partnerships 9. Younger plant-based protein food companies often rely more heavily on external partnerships 10. Influence by company's profitability focus and competitive advantage through technological knowledge 11. Impact of external factors such as the rise of plant-based diets, shifting consumer demands, and lack of political support impact the innovation process	**RQ 1** "What is the innovation process for developing plant-based protein products within food startups and SMEs in Germany?"

Figure 5.8 Key findings of the synthesised perception of the plant-based protein food innovation process (own illustration)

5.7.2 Key findings on collaboration in the plant-based protein food innovation process

The researcher of this study identified external actors and collaborative relationships within the companies' networks in the plant-based protein food innovation process from inter-story analysis of the individual actor and relationship maps. Moreover, the researcher identified the enablers of and barriers to collaboration through an inter-story analysis of micro narratives.

The findings reveal that collaboration in the plant-based protein food innovation process exists and occurs both internally and externally and involves a diverse network of actors. Internal collaboration is characterised by cross-departmental engagement and employee involvement, which fosters creativity.

Externally, collaboration spans multiple phases of the innovation process, including ideation, development, and industrial scaling. Companies engage in both transactional and co-creation models to complement resources and to share risks.

Key collaborative relationships include actors, such as suppliers, who contribute knowledge and facilitate networking, retailers, and consumers/B2B customers, who provide feedback and ideas. Academic institutions offer technological expertise. This collaboration may introduce tensions due to differing knowledge sharing and publication goals.

Horizontal collaboration is particularly evident in the organic sector, where lower competitiveness encourages knowledge exchanges. Many startups also rely on co-manufacturing partnerships with traditional animal-based food companies because of their limited production capacity. However, small companies face barriers, such as limited resources and concerns over IP, which can hinder deeper collaboration.

Moreover, the findings highlight that open innovation is a prerequisite for collaboration, although openness is often strategically limited to protecting competitive advantage, especially in technology-driven innovation contexts. Informal relationships currently play a key role in knowledge exchange, but more strategic networking is essential for advancing toward more radical innovation. Additionally, successful collaborations are built on mutual benefits, shared sustainability goals, and trust.

The ability to adapt quickly and efficiently in dynamic and collaborative settings is becoming increasingly important. Managers must respond to evolving market demands, shifting project scopes, and diverse stakeholder expectations.

Two narratives from interviewees from the traditional food industry illustrated how traditional food companies benefit from the agility and creativity of startups through collaboration, while startups gain structure and maturity from their established partners.

From the perspective of the traditional food industry, emotional competence, project management, and a sense of equality between partners are identified as critical

enablers, which is reflected in the findings of management capabilities derived from the micro narratives of the plant-based protein food companies.

Figure 5.9 summarises the key findings on actors, relationships, and collaboration in the plant-based protein food innovation process to address RQ 2.

KEY FINDINGS ON ACTORS, RELATIONSHIPS AND COLLABORATION IN THE PLANT-BASED PROTEIN FOOD INNOVATION PROCESS	ADDRESSING
1. Knowledge protection and openness exist in tension 2. Internal collaboration by employees´ and departmental engagement enables creativity 3. Companies engage in collaborative relationships with diverse actors along the food value chain, including raw material suppliers, retailers, consumers, and with other food companies 4. Transactional and co-creation collaboration models are used with a focus on complementing resources and sharing risks 5. Collaboration with academic partners can lead to conflicts between the plant-based protein food company´s necessity to protect and the academic interest of disseminating new knowledge 6. Collaboration occurs throughout different phases of the innovation process, from ideation to commercialisation, with a focus on development and industrial scaling 7. Both informal networking and strategic partnerships are utilised, with horizontal collaborations between plant-based startups and traditional food companies emerging 8. Younger plant-based protein food companies often rely more heavily on external partnerships 9. Influence by company's profitability focus and competitive advantage through technological knowledge 10. Mutual benefits, a shared vision of sustainability, and complementary resources drive successful collaborations	**RQ 2** "How do plant-based protein food startups and SMEs collaborate with their network in the innovation process?"

Figure 5.9 Key findings on actors, relationships, and collaboration in the plant-based protein food innovation process to address RQ2 (own illustration)

5.7.3 Key findings on capabilities for plant-based protein food innovation process management

The findings identify the capabilities for managing the collaborative plant-based protein food innovation process. The researcher of this study derived these capabilities from the micro narratives and the researcher's restoryings. The researcher reconstructed them into a novel conceptual framework (see Figure *6.2*).

The findings reveal the management capabilities of transformational leadership, entrepreneurial understanding, and knowledge management. These capabilities are underpinned by managers´ openness and willingness to network, as well as being interrelated with managers' personal attitudes.

Managers must actively build and maintain networks across food value chains. This requires personal attributes, such as openness, curiosity, authenticity and willingness to learn. Sustaining relationships involve consistent engagement and time investment.

Moreover, the establishment of effective collaboration is supported by emotional competencies such as passion, enthusiasm, and trust-building. Social competencies, such as assertiveness, harmonising diverse perspectives, and clear communication, are essential for managing collaborative dynamics, especially the management of knowledge transactions.

Managers foster innovation by creating psychologically safe environments that encourage employee growth, ownership and openness. Leadership that supports autonomy and shared responsibility enhances internal collaboration and readiness for external partnerships. This transformational leadership capability is interrelated with managers´ strategic mindset requirements to align collaborative efforts with company goals. Entrepreneurial understanding is necessary to effectively manage limited human, time, and financial resources, especially in startup environments.

Finally, balancing knowledge-sharing with protection is critical. Managers must guide knowledge transfer processes to ensure collaboration, while safeguarding competitive advantages, particularly in technology-driven innovation.

Figure 5.10 summarises the key findings on management capabilities for collaborative innovation in the plant-based protein food innovation process to address RQ 3.

KEY FINDINGS ON CAPABILITIES FOR PLANT-BASED PROTEIN FOOD INNOVATION PROCESS MANAGEMENT	ADDRESSING
Management capabilities 1. Transformational leadership 2. Entrepeneurial understanding 3. Knowledge management **Personal attitudes** 1. Emotional competencies 2. Social competencies 3. Personal based characteristics **Openness and ability to build and maintain networks** cf., **Figure 5.7** Framework of capabilities for collaborative innovation process management in the plant-based protein food industry	**RQ 3** "What capabilities are required to manage the innovation process in the plant-based protein food industry?"

Figure 5.10 Key findings on management capabilities for collaborative innovation in the plant-based protein food innovation process to address RQ3 (own illustration)

The following chapter critically discusses and explains the findings of this study, drawing upon extant literature debates.

6 DISCUSSION

6.1 INTRODUCTION

This chapter critically discusses the findings of this study in relation to exploring and gaining an in-depth and contextual understanding of the plant-based protein innovation process in food startups and SMEs in Germany, to map collaboration in the innovation process, and to identify capabilities required for the management of the process. The discussion was guided by the conceptual framework developed in Chapter 2 (see Figure *2.4*).

The following sections are structured around the three research questions and draw on the empirical findings presented in Chapters 4 and 5. This chapter interprets these findings in relation to prior literature and prepares the ground for the theoretical contribution developed in Chapter 7. Each section critically engages with the literature to interpret the empirical insights of this study.

6.2 DISCUSSION OF THE FINDINGS ON THE PLANT-BASED PROTEIN FOOD INNOVATION PROCESS ADDRESSING RQ 1

The findings of this study reveal that the innovation process in the plant-based protein food sector is a multistage process with sequential phases and predominantly "market-pull" in its nature, aligning with process approaches and "market-pull" models discussed by scholars (Baregheh *et al.*, 2012; Meissner and Kotsemir, 2015; Bigliardi *et al.*, 2020). Plant-based protein food companies are innovating in response to consumer needs, particularly the growing demand for healthier and more sustainable alternatives to animal-based food products. This consumer-centric approach is evident in the initial phases of the innovation process (ideation, idea selection, and concept/prototyping), in which companies actively engage with consumers and B2B customers to co-create, select, and refine product ideas.

However, while the process is agile and iterative, it remains largely incremental in innovation outcomes. Most companies focus on improving existing products and

enhancing taste, texture, or ingredient profiles rather than pursuing radical innovation. This supports the broader literature on food innovation, which highlights the food industry´s preference for low-risk, incremental changes, as documented by numerous scholars (Baregheh *et al.*, 2012; Holman, Devane and Cady, 2017; Tarabella *et al.*, 2019a).

Moreover, innovation outcomes are mainly product and process innovations that are often indistinguishable and interrelated. These findings confirm the views of Saari et al. (2021) and Weindlmaier (2001) regarding the predominance and interrelationship between product and process innovation in the food industry.

Additionally, the majority of emerging plant-based protein food companies utilise existing technology in the traditional animal-based protein food industry, corroborating the assumption of the “market-pull” models that innovation is based on existing technologies (Meissner and Kotsemir, 2015).

Hayes and Abernathy (1980) warned of the strategic risk posed by “technological incrementalism", whereby organisations become locked into existing technological trajectories and lose the capacity to respond to more disruptive shifts in markets and technologies. This concern remains relevant today, as Christensen (2013) argues that companies focusing on sustaining innovations often fail to adapt to disruptive technologies, ultimately risking strategic decline. This risk is particularly pronounced among the mature companies in the plant-based protein food sector, where innovation is often constrained by the limitations of proprietary production possibilities and resources. Most startups in the plant-based protein food sector operate with co-manufacturing capacity and appear to have greater strategic flexibility. These companies are better positioned to experiment with emerging technologies and to adapt to evolving consumer expectations.

In this context, research findings demonstrate that some startups in the plant-based protein food sector push the boundaries of what is possible. These are progressing to the next developmental stage of the sector, exploring novel process technologies and alternative protein sources. Their efforts signal a shift to more radical innovations,

although this transition is constrained by regulatory uncertainty, investments, limited internal resources and the need to protect proprietary knowledge, underlining the potent innovation mentioned by Baregheh *et al.* (2012) and Verhees and Meulenberg (2004).

The challenges of the next developmental stage of the sector are discussed in the following section.

6.2.1 The next developmental stage: Balancing Consumer demand and technological focus

The evolution of the sector to the second generation of plant-based protein food innovations contains a critical tension and the need to balance consumer-centricity with technological advancement. While consumer demand remains the primary driver of innovation, companies increasingly recognise that meeting future demand for cleaner labels and whole cut meat and fish analogues requires investments in disruptive technologies and intensive research.

This tension is well captured by Chandy and Tellis´s (1998) model which distinguishes incremental, market breakthrough, technological breakthrough and radical innovation. The technological dimension of this model determines whether a product involves a novel technology. The consumer dimension assesses whether a product fulfils key consumer needs better. Most plant-based protein food companies in this study fell within incremental or market breakthrough categories (see Figure *6.1*).

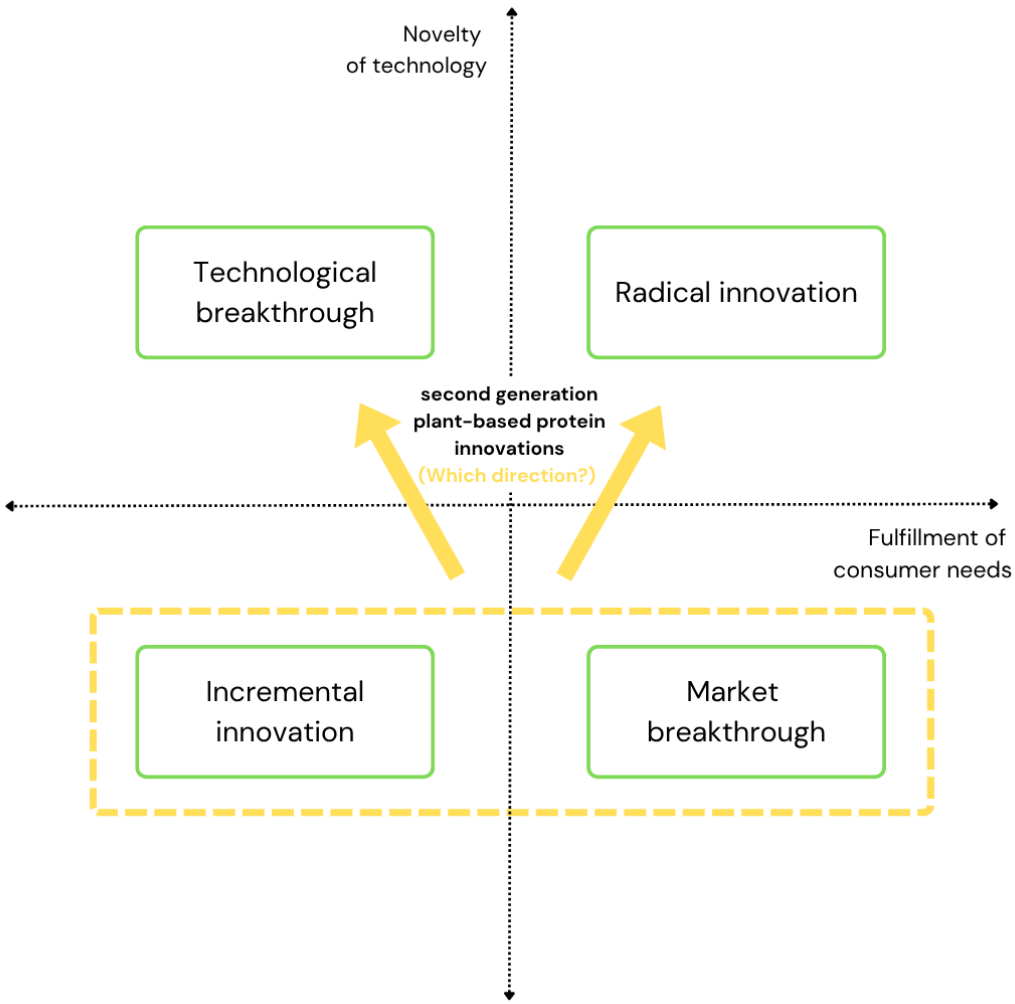


Figure 6.1 The Chandy and Tellis (1998) model applied for plant-based protein food innovation and the second generation of product development (own illustration)

It will, however, remain a relevant question as to what direction (technological breakthrough or radical innovation) plant-based protein food companies will take in the next developmental stage of the sector. All will depend on the extent to which these companies succeed in balancing consumer needs and technological progress (see Figure *6.1*). As Tellis, Prabhu and Chandy (2009) suggest, the ability to pursue radical innovations is often shaped by organisational culture and strategic orientation. The research findings indicate that as innovation processes become increasingly technology-driven, organisations may risk overemphasising technological aspects while neglecting consumer needs. Innovations can be perceived as being overly processed or artificial. As

Narrator C noted: “We´re producing food for people, not for robots”. This underscores the importance of maintaining a human-centred design approach, even as companies adopt more sophisticated technologies, as outlined in the introduction chapter of this study (see Figure 1.1). Technology-driven companies in the plant-based protein food sector must develop agility to respond quickly to consumer feedback, as well as strategic foresight for long-term technological innovation. This duality is essential for advancing the sector and realising its full potential as a driver of the food system´s transformation towards sustainability and health.

The subsequent section critically discusses the focal events of efficiency and creativity as key success factors in the innovation process of plant-based protein food companies.

6.2.2 Efficiency and Creativity: Focal events and key success factors in the plant-based protein food innovation process

Bigliardi and Galanakis (2020) identify innovation as a strategic imperative for long-term competitiveness and market sector expansion in the food industry. This study reveals that the interplay between creativity and efficiency in the plant-based protein food innovation process is an important factor which contributes to a company's success and innovativeness. This finding provides empirical detail to the literature on food innovation determinants.

The narrators of plant-based protein food companies emphasised efficiency, particularly in terms of time-to-market and resource allocation. This builds on Menrad´s (2007) and Galanakis´ (2021) assertion that the speed of innovation processes is a critical success factor.

However, the findings imply that efficiency is not merely operational but also strategic. For many plant-based protein food companies in this study, efficiency was a means of achieving robust profitability and financial viability, which in turn enabled sustained innovation investment and increased attractiveness to external investors. This finding reinforces and expands upon Tarabella et al.`s (2019) observation that financial constraints are a key barrier faced by young companies. This study also nuances the

authors´ argument by showing how startup companies in the sector actively design an efficient and lean innovation process to mitigate these constraints.

One notable strategy for enhancing efficiency and managing risk is the outsourcing of the financially and technologically demanding upscaling and industrial scaling phases in the plant-based protein process through co-manufacturing. Moreover, Narrator L´s startup company not only co-manufactures but also strategically co-creates and outsources risk by collaborating with traditional food SMEs. This type of risk sharing has been underexplored in the literature. While Tarabella et al. (2019) identify risk sharing as a theoretical solution in financial limitations from the literature, this study provides empirical evidence of how such arrangements are operationalised in practice.

Furthermore, this study reveals that creativity is a counterbalance to efficiency. While efficiency ensures viability, creativity also drives differentiation and consumer appeal. These findings support Tarabella et al. (2019), who emphasise the quality of human resources as one of the most critical success factors for food innovation, especially in the context of sustainability (Bossle *et al.*, 2016). This study contextualises the existing literature by showing how companies actively encourage employee creativity by not only employing experienced food innovation managers but also fostering a culture that encourages experimentation and cross-functional collaboration.

While financial limitations are real, the narratives reveal that plant-based protein food startups are often characterised as dynamic, agile, and market-oriented, which enables them to respond quickly to consumer demands. This result reinforces and expands the findings of Tarabella et al. (2019) claiming that creativity and agility may compensate for the structural disadvantages.

The concept of agility is discussed in detail in the subsequent section.

6.2.3 Agility: The driver for creativity and innovation in the plant-based protein process

The narratives of this study highlight the interrelationship between agility and internal employee engagement, and the facilitation of creativity. The narrators mostly describe their companies' plant-based protein innovation processes as agile and flexible. These findings corroborate Conboy and Fitzgerald (2004, p. 40) conceptualisation of agility which defines flexibility as inherent to agility: "the continual readiness of an entity to rapidly or inherently, proactively or reactively, embrace change, through high quality, simplistic, economical components and relationships with its environment". Moreover, the narratives reveal that agility in plant-based protein food innovation is deeply embedded in collaborative practices and leadership behaviours that foster creativity.

Franco and Landini (2022) asserted that agility enhances employee commitment, which in turn stimulates creativity and innovation and is strongly supported by the narratives in this study. In contrast to traditional food companies with efficient and highly structured innovation processes, plant-based protein food companies demonstrate a fluid, cross-functional approach to innovation. This agility enables rapid iteration, quick response to consumer feedback, and the integration of diverse perspectives, which are critical in a fast-evolving sector.

Moreover, these findings challenge the assumption that agility is reactive. Instead, agility is deliberately cultivated through agile leadership management, which facilitates creativity through employee engagement, empowers internal collaboration across departments and encourages experimentation. This strengthens and adds empirical depth to emerging views in the innovation literature that link agility to transformational leadership and organisational learning (Brand *et al.*, 2021).

Consumer centric thinking, similar to the Design Thinking method, particularly applied in the initial phases of the innovation process, further highlights a new dimension of how agility is operationalised to enhance creativity. These methods not only facilitate internal collaboration but also extend creativity externally by involving consumers and customers in co-creation processes. This finding aligns and empirically illustrates the

shift from traditional R&D-driven models to human-centred, iterative innovation processes, which are increasingly recognised as effective in sustainability-oriented sectors (Bocken *et al.*, 2014; Buhl *et al.*, 2019).

Moreover, traditional medium-sized and larger food industry companies within the German Mittelstand are characterised by a lack of agility and more rigid structures, as discussed in Section 5.6. This underscores the broader tension in the food industry in balancing efficiency and adaptability. Although traditional food companies may benefit from established processes and scale capacities (Tarabella *et al.*, 2019), their lack of agility may hinder their capability to innovate in response to shifting consumer values and sustainability constraints.

The subsequent section critically examines the role of collaboration in the plant-based protein food process, drawing on the findings and relevant literature addressing RQ 2.

6.3 DISCUSSION OF THE FINDINGS ON COLLABORATION IN THE PLANT-BASED PROTEIN FOOD INNOVATION PROCESS ADDRESSING RQ 2

The researcher of this study identified external collaboration as central to most of the narrators' innovation processes; the only exception being a small number of more mature companies such as those represented by Narrators T and O, where internal capabilities played a more prominent role. Collaboration in the plant-based protein food innovation process spans multiple phases, from ideation and development to industrial scaling, contrary to existing literature that often limits collaboration to the early implementation stages (Bigliardi and Galati, 2013b; Procopio Schoen, 2017). This broader scope of collaboration underscores the complex and resource-intensive nature of plant-based protein food innovation, which often requires sustained relationships across both the value chain and horizontal partnerships.

The findings also reveal tension between openness and protection, particularly in technology-driven contexts. This tension is explored in detail in the following subsection.

6.3.1 The grey zone of openness in the plant-based protein food process

The concept of open innovation has become a foundational paradigm in contemporary theory, particularly in sectors that are driven by sustainability and health (Chesbrough, 2003; Valkokari, Paasi and Rantala, 2012).

While the literature provides new evidence that open innovation is gaining traction in the food industry, particularly among SMEs responding to internal and external influences such as sustainability constraints (Bigliardi and Galati, 2013a; Bresciani, 2017), this study reveals a more nuanced reality in the plant-based protein food sector.

Rather than adopting unfiltered openness, plant-based protein startup companies appear to weigh the potential benefits of collaboration against the risk of losing knowledge and competitive advantage, as told by Narrators F and A. This finding challenges the assumption that openness is inherently beneficial. It reinforces and expands upon a more context-sensitive understanding of open innovation (Bigliardi *et al.*, 2021).

While food SMEs are often characterised by a “defender” or “reactor” orientation to external collaboration (Distanont and Khongmalai, 2020), the plant-based protein food companies in this study exhibit a more nuanced approach. Plant-based protein food companies engage in external collaboration, particularly with academic institutions and co-manufacturers, to access expertise and scaling infrastructure. On the other hand, the protection of this knowledge plays a more significant role as more technology and process knowledge drives the innovation process. This is relevant, because knowledge represents a competitive advantage for these companies. This strategic selectivity reflects what this study conceptualises as a “grey zone of openness”, in which technology-driven plant-based protein food companies limit their openness in the innovation process to protect proprietary knowledge.

The researcher of this study was initially taken aback by this finding, as the narratives contradicted the researcher´s assumption from her professional experience that plant-based protein food companies would embrace openness more fully. This unexpected insight underscores the importance of examining openness as a context-dependent

strategy, shaped by the perceived value and vulnerability of knowledge assets (Bigliardi *et al.*, 2021). Companies have also implemented measures to mitigate the risks associated with knowledge sharing. This finding builds on Bigliardi et al.´s (2021) view that the development of knowledge sharing is one of the primary risks linked with open innovation practices. Moreover, it corroborates Bigliardi et al.´s (2021) warning that open innovation can expose organisations to risks if knowledge protection is not adequately managed.

Furthermore, plant-based protein food startup companies are constrained to collaborate with academic partners during the R&D phase to acquire additional expertise and access technological equipment. These partnerships often have inherent conflicts in the management of knowledge and diverse interests of their partners. Plant-based protein food companies tend to protect new knowledge in order to prioritise first-mover advantage, whereas academic partners have an inherent interest in publishing and disseminating novel knowledge. This tension underscores the need for robust knowledge management in collaborative innovation, a topic that remains underexplored in food innovation literature.

Despite these protective tendencies, the findings reveal that plant-based protein food companies´ internal agility and employee engagement foster a mindset conducive to external collaboration during the innovation process. This finding helps clarify how internal openness and agility can be prerequisites for the effective management of external collaboration by creating a mindset that enables und support external collaboration. This dynamic requires further research.

The discussion of collaboration in the plant-based protein food sector is guided by the model components of networked innovation: multiple actor networks, collaboration models and collaboration purposes.

The next section critically discusses the collaborative relationships of multiple actor networks in the plant-based protein food innovation process.

6.3.2 Evolving collaboration models and strategic networking in the plant-based protein food sector

The researcher of this study reconstructed a network of external actors and collaborative relationships in the plant-based protein food innovation process from the narratives (see Figure 5.4). According to Van de Vrande et al. (2009), networking encompasses a continuum of interactions, ranging from informal contacts that facilitate innovation processes to the formation of formal strategic alliances with multiple partners.

The findings do not clearly outline formalised strategic collaborative relationships with actors along the value chain, such as with raw material suppliers. These findings point to informal relationships between plant-based protein food companies and suppliers. For example, suppliers are installed as a source of knowledge next to their supplying function in the plant-based protein food process. This nuanced form of collaboration adds empirical insight into how the plant-based protein food sector is moving in a new direction yet has not fully capitalise on the potential of strategic value chain integration.

This study´s researcher concludes that strategic networking along the food value chain and a redefinition of these actors´ roles in the innovation network will be required for the enablement of more radical innovation and advancing to the next developmental stage of innovation in the sector. This includes exploring co-creation opportunities and shared knowledge building activities more closely, for example, with upstream actors from the agricultural sector.

The findings also revealed that plant-based protein food startup companies are dependent on external collaboration due to the lack of proprietary technological development facilities or production capacities. They need to form strategic partnerships with academic institutes for co-development and form horizontal collaborations with the traditional animal-based food industry for co-manufacturing. These findings align with Bowser et al. ´s (2024) analysis, which highlights the growing importance of cross-sectoral partnerships in achieving sustainability and innovation goals. This shift provides additional empirical insight into a broader trend in the food

industry, where startups increasingly engage in cross-sectoral partnerships to access infrastructure, expertise and market legitimacy.

Moreover, the researcher identified emerging opportunities for horizontal co-creation between plant-based food companies, particularly when business models are compatible rather than competitive. These collaborations complement resources and share risk, aligning with Deiters and Schiefer´s (2012) argument that learning and innovation in food SMEs are closely tied to the implementation of network activities. The collaboration-in-action cases presented in Section 5.6 exemplify how medium-sized traditional food companies and plant-based protein food startups can co-create value across sectoral boundaries. These cases also highlight the learning opportunities for both parties, as well as the managerial obstacles and cultural challenges inherent in such collaborations, particularly the need for a cultural transformation within traditional food SMEs to embrace more open and agile collaboration models outlined by the Narrators of the traditional food SMEs and derived from the macro narratives of the event documentation.

These findings underscore the importance of networking in enabling collaborative relationships in the sector (Ricciotti, 2020). Narrators emphasised the necessity of conceptualising and establishing networking beyond the knowledge boundaries of plant-based protein food companies and sector.

Moreover, narratives indicate a trend towards multi-actor constellations where innovation is co-developed across a broader network of collaborating actors. These include suppliers and academic institutions, as well as co-manufacturers and consultants. This evolution illustrates the growing recognition that innovation in the plant-based protein food sector is not a linear process but a networked and iterative process, shaped by knowledge inflows and outflows, as well as independencies.

Antonaras and Dekoulou (2016) argued that robust networks can be formed within similar industries or among actors with shared professional or scientific interests. In contrast to the literature, the findings of this study imply that emerging networks require a more open model of networking to establish a more comprehensive

community as a potential collaboration pool and acquisition of new knowledge. Valkokari (2024) supports this view and argues in favour of ecosystem-based innovation approaches that go beyond traditional industry silos. Reflecting these insights, this study proposes that future research should adopt an ecosystem research perspective to better understand the dynamics of multi-actor collaboration in the plant-based protein food sector.

In contrast to the literature, which suggests that external networking and collaboration are implemented by food SMEs, primarily in the initial exploratory phases and in the implementation of innovation (Lee et al., 2010; Tarabella et al., 2019), the findings of this study indicate a broader application of collaborative models. Specifically, transactional and co-creation collaborations are prominent during the development and industrial scaling phases. This expanded collaboration focus underscores the conceptualisation of innovation in the plant-based protein food sector as a multi-phased networked-enabled process, rather than a sequence of stages.

The following subsection compares and critically discusses the benefits of collaboration at the operational and strategic levels for plant-based protein food companies, with the benefits delineated in the extant literature.

6.3.3 Purpose of collaborative plant-based protein food innovation on operational and strategic level

Plant-based protein food companies benefit from collaboration for innovation by creating value at both operational and strategic levels. These collaborative engagements evolve in response to internal developments, external pressures, and partnership dynamics as discussed by Maurer and Valkenburg (2014). These internal and external dynamics were captured through the methodological framework of the dynamic network processes used in this study.

This section critically compares the findings of this study with established purposes of collaboration in the innovation literature, building on the framework by Maurer and

Valkenburg (2014) and extending it with benefits derived from the food innovation literature.

While innovation literature often categorises collaboration benefits into distinct operational or strategic domains, the findings of this study imply a more fluid and overlapping reality. Companies frequently pursue multiple objectives simultaneously, such as accessing knowledge while mitigating risk or accelerating time-to-market, reflecting the multi-dimensional nature of innovation in the plant-based protein food sector.

The Table *6.1* synthesises the benefits of collaborative innovation at both levels, comparing established literature with the empirical findings of this study. Additions from the food innovation literature and this study reflect sector-specific nuances. The identified purposes suggest that collaborative innovation in the plant-based protein food sector is both an operational necessity and strategic choice. At the operation level, it enables companies to overcome resource constraints and accelerate their development. Strategically, it supports long-term adaptability, sustainability, and competitiveness, particularly for startups among plant-based protein food companies. Therefore, the purposes for collaboration are not only multi-layered, but also dynamic and change as companies develop.

Table 6.1 Comparative overview of the purpose of collaboration at operational and strategic level in the innovation process (own illustration adapted from Maurer and Valkenberg, 2014)

Level	Literature based purposes of collaborative innovation processes Green= Food innovation literature	Purpose of collaboration in the plant-based protein food innovation process (Findings of this study)
Operational	Knowledge gain (Pittaway *et al.*, 2004); Social interaction, Learning and development as key competencies for innovation (Deiters and Schiefer, 2012)	Knowledge and creativity development through informal and academic relationships
	Access to external knowledge (Pittaway *et al.*, 2004); (Rammer *et al.* 2006; Wixe et al., 2023)	External expertise acquisition, especially in R&D and scaling
	Pooling complementary skills (Pittaway *et al.*, 2004); Technological advantages (Tachie, Nwachukwu and Aryee, 2023)	Co-manufacturing and co-development to overcome infrastructure gaps (startups)
	Speed to market (Pittaway *et al.*, 2004)	Faster prototyping and market entry via shared facilities
	Market awareness (Van de Vrande *et al.*, 2009)	Keeping pace with consumer trends and sustainability demands
	Internal urgency and cost reduction (Chesbrough and Crowther, 2006)	Stimulating internal innovation culture and reducing R&D costs
Strategic	Risk sharing (Pittaway *et al.*, 2004; Miotti and Sachwald, 2003); Competitive positioning (Bigliardi 2013)	Mitigating market and technological uncertainty; responding to shifting consumer values
	Business model adaptation (Pittaway et al, 2004)	Dependency on external scaling and evolving business models
	Innovation-driven growth (Chesbrough and Crowther, 2006)	Leveraging external technology for profitability and differentiation
	Monitoring disruptive technologies that may be a threat to the own business (Chesbrough and Crowther, 2006)	Strategic foresight and resilience building
	Innovation for sustainability (Ricciotti, 2020)	Alignment with normative goals and long-term sectoral transformation

The subsequent section explores how these collaborative purposes contribute to the formation of value networks in the plant-based protein innovation process.

6.3.4 Creating shared value along the plant-based protein food innovation process: Suggestion of a value network

The findings of this study elucidate the importance of mutual benefits in the collaborative relationships of plant-based protein food companies which expose shared value creation during the plant-based protein food innovation process. These mutual benefits encompass the co-creation of new knowledge, the development of novel processes and products and the advancement of a shared vision of sustainability and health (Ricciotti, 2020). These collaborative relationships reflect a shift from linear value chains to more dynamic and interdependent value networks.

Moreover, the findings of this study corroborate Ricciotti´s (2020) conceptualisation of value networks as driven by five interrelated forces: the growing emphasis on sustainability, intensified global competition, the necessity for collaboration, the growing importance of intangible assets, and the demand for flexibility and agility. While this study did not explicitly examine globalisation, it corroborates the other four drivers:

Sustainability has emerged as a normative consideration across narratives, with companies aligning innovation efforts with environmental and ethical goals (for example, Narrators W and T).

Collaboration was essential for plant-based protein food companies as internal skills often fall short of meeting evolving customer needs, corroborated by the examples of complementing resources.

Intangible assets have gained prominence over tangible assets in the digital age, becoming vital for company survival, which is reflected in the importance of knowledge as a source of competitive advantage, as outlined by narrators, such as F and C.

Finally, the ability to adapt quickly to various challenges with a lean structure has become a key factor in the success of organisations, corroborated by the synthesised characteristics of the plant-based innovation process of agility and flexibility.

Notably, the collaboration-in-action cases illustrate how traditional food companies can enhance their agility and innovation capacity through partnerships with plant-based protein food startup companies. These cases exemplify the potential of value networks to bridge emerging food sectors with the traditional food industry and foster co-creation across organisational boundaries.

However, the literature on value networks within the context of food innovation remains underdeveloped. Peppard and Rylander (2006) argue that value is no longer created by individual organisations but through value-creating networks composed of interconnected actors. This study adopted a similar perspective, conceptualised by Valkokari, Paasi and Rantala´s (2012) model of networked innovation, which emphasises the distributed nature of value generation across collaborative relationships.

These findings also underscore the role of normative alignment in supporting value networks. Breuer and Lüdeke-Freund (2014) consider normative management crucial for the development of shared goals and values to harmonise diverse interests and enable long-term collaboration. The narratives in this study revealed a strong shared vision for food system transformation, particularly around the shift towards plant-based diets. Moreover, narratives, such as of Narrator H´s and the collaboration-in-action cases (see Section 5.6), demonstrate how a shared normative understanding of the need for change and the transformation to more plant-based protein alternatives motivates a respectful and mutually economically beneficial collaboration between traditional animal-based and plant-based protein food companies.

Nevertheless, this study also identifies obstacles and enablers that influence the success of such collaborations. These include tensions around knowledge protection, differences in management style and organisational culture, and asymmetries in resources. Addressing these challenges requires a deeper understanding of how value is co-created and distributed among diverse actors.

Finally, the researcher acknowledges the scope limitation of this study. The study focused on the perspective of plant-based protein food innovation companies and their collaborative relationships. The way other network actors generate value among themselves could not be examined within the scope of this research. Future research should adopt a holistic ecosystem lens to capture the full complexity of value creation in food innovation networks.

The following section discusses the findings on the management capabilities required for collaborative innovation.

6.4 DISCUSSION ON THE FINDINGS OF MANAGEMENT CAPABILITIES FOR COLLABORATIVE INNOVATION IN THE PLANT-BASED PROTEIN FOOD SECTOR ADDRESSING RQ 3

This section critically discusses the findings related to the management capabilities required to support collaborative innovation in the plant-based protein food sector, addressing RQ 3. The discussion builds on the empirical findings and situates them in the literature of management capabilities for food innovation processes, outlined in Section 2.4.

Despite the increasing relevance of open and networked innovation models in the food industry, empirical research on the management capabilities required to operationalise these models remains scarce (Beham et al., 2006; Procopio Schoen, 2017). The findings from the study suggest three management capability themes: transformational leadership, entrepreneurial understanding, and knowledge management. These capabilities are not only essential for managing innovation internally but also for navigating the complexities of external collaborations.

6.4.1 Manager´s personal attitudes as enablers of networking and collaboration

The findings reveal that managers' personal attitudes, particularly curiosity, openness and willingness to learn, as well as personality-based characteristics, play an essential role in networking, and managing collaborative relationships, both within the organisation and externally. These attributes enable managers to engage in exploratory learning, to identify potential collaboration partners and to cultivate trust-based relationships. This builds on Deiters and Schiefer´s (2012) assertion that communication, social interaction, learning and competency development are crucial factors for the advancement of food innovation. The two authors´ perspective that networking and collaboration serve as appropriate mechanisms for fostering innovation is mirrored in this study´s findings, specifically that managers´ curiosity and willingness to learn are central to initiating and maintaining collaborative relationships.

Moreover, Valkokari and Helander (2007) emphasise that the formation of innovation networks is inherently uncertain and shaped by socio-psychological dynamics. This includes the emotional and interpersonal dimensions of relationship building, which narrators described by trust, empathy and interpersonal “fit” as decisive factors in successful collaborations.

The networks are primarily based on personal relationships; smaller companies' networks often overlap with entrepreneurs' networks (Biggiero, 2001). The collaboration-in-action cases in section 5.6 highlights a new dimension of the involvement and commitment of companies' CEOs in networking and relationship building. Furthermore, the findings revealed that the emotional ability to establish relationships and create an *“optimal interpersonal match”* was of utmost importance.

In addition, the findings indicate that managers' competencies in maintaining networks are equally as crucial and challenging as establishing networks. This demonstrates a novel aspect of Cenamor, Parida and Wincent´s (2019) framework, which emphasises coordination, partner knowledge, and internal communication as key dimensions of networking capability. The narratives, such as those of W and H, also indicate that these

capabilities are not inherent and evolve through experience, reflection and iterative learning, particularly in the face of collaboration failures.

Finally, this study highlights that a manager's passion, enthusiasm and ambition contribute to their charisma (personal-based characteristics) which plays a powerful role in driving collaborative innovation processes, as exemplified by narrators such as W and P. This charisma is often closely linked to the sector's shared vision for the future of food, reinforcing the idea that innovation in this area is not only technical but also deeply value driven.

6.4.2 Transformational leadership, entrepreneurial understanding, and change orientation

Beyond networking, this study identified transformational leadership as a critical enabler. Managers who exhibit vision, empathy, and a willingness to embrace uncertainty are better equipped to lead their organisations through the cultural shifts required for open innovation. This reinforces and expands Traitler, Watzke and Saguy´s (2011) argument that leadership commitment and tolerance for failure are prerequisites for co-creation.

These findings reinforce the importance of entrepreneurial capabilities, such as opportunity recognition, experimentation, and risk-taking, as essential for implementing innovation and introducing new products and services (Antonaras and Dekoulou, 2016).

Moreover, this study reveals that willingness to change is a prerequisite for building both managerial and entrepreneurial capabilities for innovation. A company´s leadership must not only accept the shift but also take the risk of failure and uncertainty in collaborative activities. This includes managing expectations and fostering acceptance among collaborating organisations, an insight strongly supported by the narratives, such as from narrator L.

Bocken et al. (2014) and Buhl et al. (2019) argue that motivation of responsibility is essential to overcome the main challenges identified in approaching innovation for sustainability, especially at the front-end of the innovation process. This study corroborates this view, showing how narrators are often driven by a sense of purpose that exceeds commercial objectives, exemplified by narrators such as T and Z.

The narratives reveal that successful collaboration often builds on an organisation´s internal capabilities, such as openness to change, risk-taking, and shared ownership. These findings resonate with the literature on entrepreneurial capabilities, which highlights the importance of creative problem solving, opportunity recognition and self-confidence (Kwong et al., 2012; Antonaras and Dekoulou, 2016).

Moreover, narrators such as O and C represent a transformational type of leadership that fosters an internal organisational environment in which experimentation and cross-departmental collaboration are encouraged in the innovation process.

The insights into transformational leadership in internal and external collaborative innovation processes is particularly novel in the context of food innovation literature, which has traditionally focused on the structural or technological challenges of innovation.

6.4.3 Knowledge management as a strategic capability

The adoption of an open innovation approach is inextricably linked to an organisation's awareness of its knowledge management capabilities. Managers must not only successfully access external knowledge but must be able to integrate it effectively into their internal innovation processes. This requires absorptive capabilities such as the ability to recognise, assimilate and apply it to the innovation process (Wallin and Von Krogh, 2010). The findings of this study also determine knowledge management as the third pillar of management capabilities for collaborative innovation relationships. The findings, such as Fs narrative, illustrate that plant-based protein food companies often rely on external expertise from academic partners, consultants or co-manufacturers due to limited internal R&D infrastructure. However, the success of these collaborations

depends on a company´s ability to translate external knowledge into innovation. This reinforces and expands upon Bigliardi et al.´s (2020) argument that knowledge management is a core capability of open food innovation processes.

6.4.4 Framework of capabilities for collaborative innovation process management in the plant-based food industry

The findings indicate that the three key capabilities do not operate in isolation but rather exist in interdependency. The themes of entrepreneurial understanding and knowledge management are closely interrelated to transformational leadership. For instance, entrepreneurial understanding enables transformational leadership. Likewise, knowledge management is both a product of and lead into transformational leadership. Managers who demonstrate emotional and social competencies are better positioned to foster trust, which in turn facilitates open knowledge exchange.

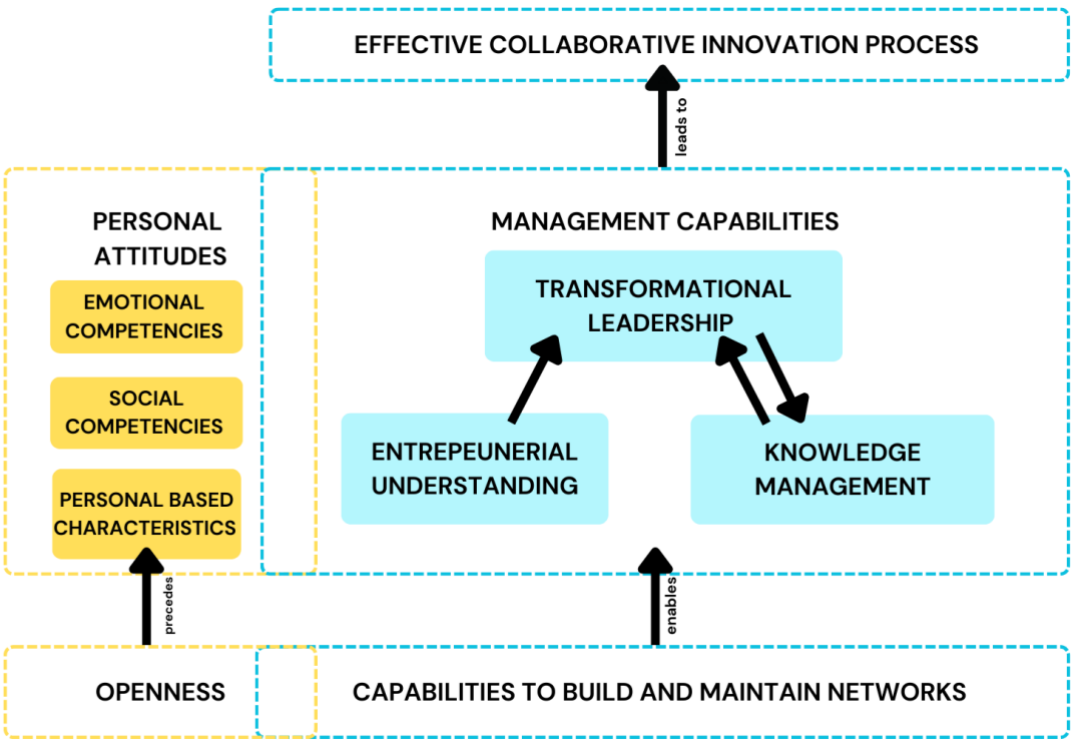
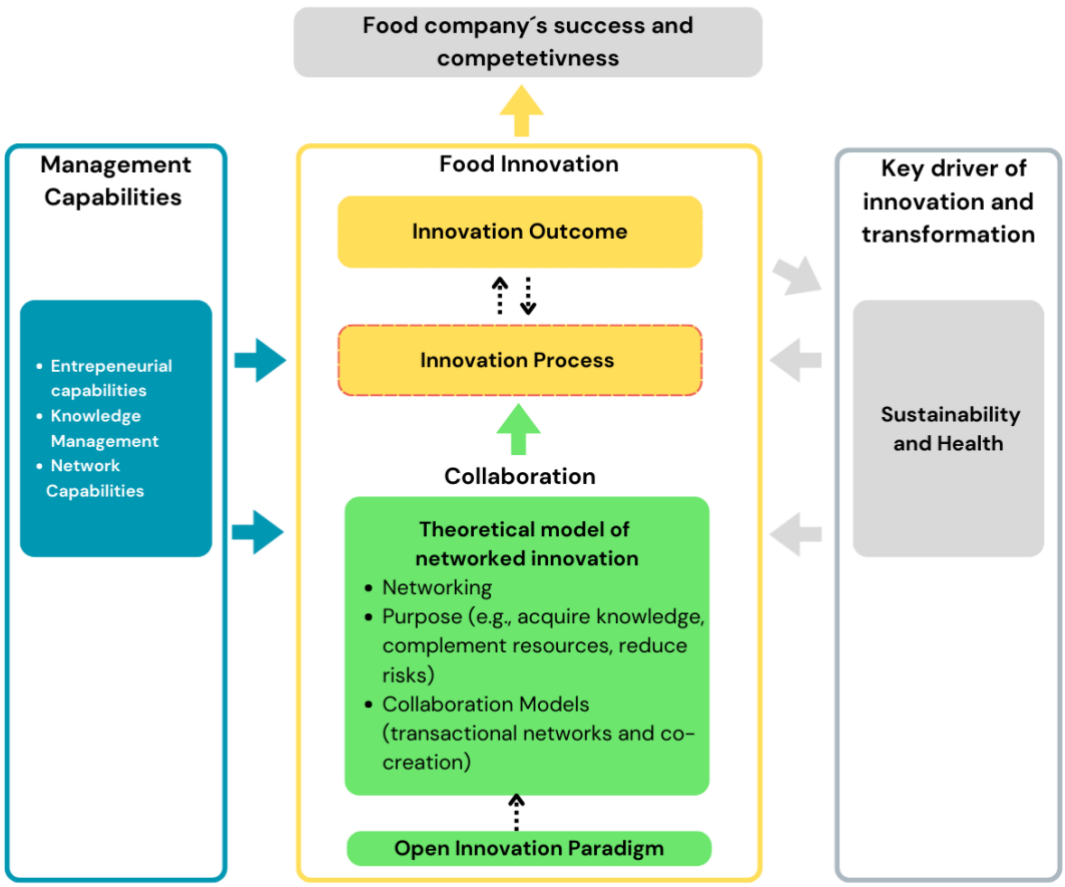


Figure 6.2 Framework of capabilities for collaborative innovation process management in the plant-based protein food industry (own illustration)

Finally, the researcher of this thesis reconstructed an integrated framework of capabilities that underpins successful collaborative innovation process management in the plant-based protein food sector to respond to RQ 3. (see *Figure 6.2*). Together, these capabilities form a dynamic system of capabilities and competencies in which personal attitudes, entrepreneurial understanding, knowledge management, and transformational leadership reinforce one another.

6.5 RE-DEVELOPMENT OF THE FINAL CONCEPTUAL FRAMEWORK

The discussion was guided by the conceptual framework originally developed in Chapter 2 (see Figure *2.4*, reproduced below).



This initial framework was grounded in existing literature and integrated the key concepts of innovation processes and outcomes, collaborative innovation

(operationalised through the theoretical model of networked innovation), and management capabilities. It provided a valuable theoretical lens for guiding the empirical exploration, interpretation and discussion. The framework reflects the dynamic interplay between these elements and the sector´s key drivers: sustainability and health.

However, through the empirical exploration of the plant-based protein food innovation process, empirical insights emerged that necessitated a refinement of the original framework. Figure 6.3 presents the redeveloped conceptual framework, which incorporates these empirical findings.

Elements that were refined, expanded or empirical emerged elements derived from the findings of this study are highlighted in purple. This revised conceptual framework offers a more dynamic and context-sensitive model for understanding the collaborative innovation process in the sustainability and health-driven plant-based protein food sector.

The re-development of the framework was fuelled by several insights: The confirmation of the sequential, consumer-driven nature of the food innovation process. The identification of agility and internal creativity as focal events. The extension of traditional linear models to include iterative, adaptive and co-creative dynamics. The recognition of contextual factors such as company maturity as influential in shaping the innovation process.

This re-developed conceptual framework not only enhances theoretical understanding but also provides a foundation for future research and practical applications in food innovation, sustainability transformation and innovation management.

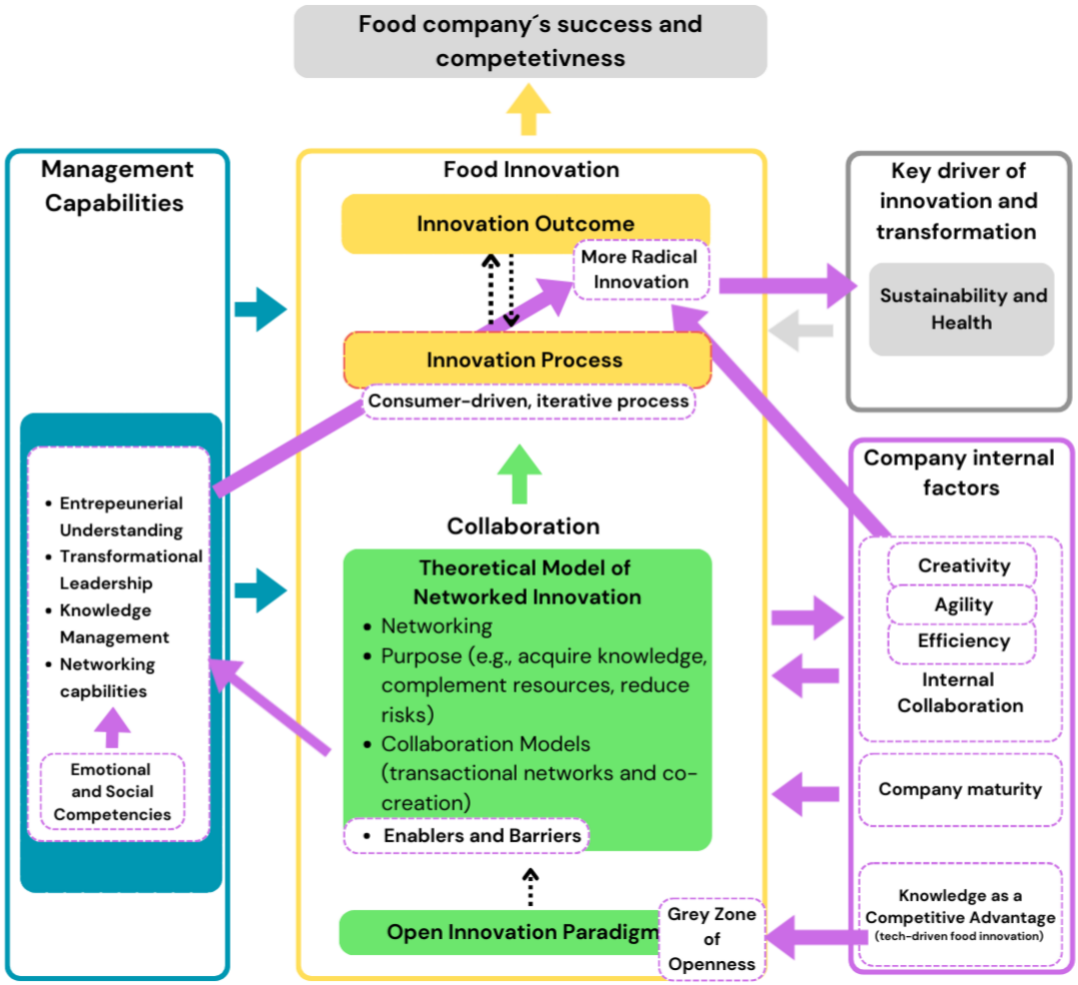


Figure 6.3 Re-developed and final conceptual framework for exploration of the collaborative innovation process in the plant-based protein food sector (own illustration)

6.6 CONCLUDING SUMMARY

This discussion chapter critically examined the empirical findings of this study in relation to the existing literature and the initial conceptual framework, addressing the three research questions through a synthesis of intra- and inter-story analysis.

The innovation process in the plant-based protein food sector was found to be agile, iterative, and shaped by both internal dynamics, such as creativity and profitability and externally shaped by consumer expectations for sustainability and health and limited political support. While the mature companies operate within existing technological capacities, the startups are pushing toward more radical innovation in the next developmental stage of the sector.

Collaboration emerged as a central theme, occurring both internally and externally, involving diverse actors such as suppliers, retailers, consumers, academic institutions, and co-manufacturing partners. These relationships span the entire innovation process and are not limited to its initial phases. External collaboration is enabled by shared values, mutual trust, and strategic alignment, while also challenged by resource constraints, knowledge protection concerns, and cultural differences. A key insight was the emergence of a “grey zone of openness”, in which companies strategically balanced knowledge sharing with protection, rather than adopting openness uniformly across partners or stages.

This study identifies three key interrelated management capabilities essential for collaborative innovation: transformational leadership, entrepreneurial understanding, and knowledge management. These capabilities are not only technical or structural but also deeply interpersonal. These capabilities enable managers to navigate complex innovation environments and foster effective collaboration across organisational boundaries.

Building on these insights, the researcher re-developed the initial conceptual framework presented and discussed in the preceding section.

The concluding chapter that follows presents an integrated response to each RQ and lays the foundation for the theoretical, methodological, and practical contributions of this thesis.

7 CONCLUSION

7.1 INTRODUCTION

Since the commencement of this study the transformation of the food system towards sustainability and health has continued to accelerate. Plant-based protein alternatives have made significant contributions to this transformation, and the growth of this sector is driven by innovation and consumer demand. Reflecting on this momentum, the German expert nutrionists network Nutrition Hub (2025) stated the following:

"*The trend towards a plant-based diet seems to have come to stay.*"

According to the network´s 2025 nutrition trend report, "*the clear frontrunner among the 2025 nutrition trends is: plant-based and flexitarian diets. 82 percent of experts believed that the trend is still on the upswing. (...) The motivation behind this is diverse; health benefits, such as a reduced risk of chronic diseases, play just as important a role as sustainability. The food industry is responding with innovations and is working on optimising plant-based protein alternatives with an increasing focus on nutrient-rich, less processed products.*" (Nutrition Hub, 2025).

The industry´s response aligns with the findings of this study, which highlight the challenges of the next innovation development stage of the plant-based protein food sector.

The aim of this study was to explore and gain an in-depth and contextual understanding of the plant-based protein innovation process in food startups and SMEs in Germany, to map collaboration in the innovation process, and to identify capabilities required for the management of the process. The research was conducted through a narrative inquiry and an exploratory inductive research approach, underpinned by the philosophy of moderate constructivism. The researcher used narrative interviews with participants from purely plant-based protein food companies as the primary data source (micro narratives), supplemented by the collection of collectively constructed documentation (macro narratives). Furthermore, the researcher conducted a two-step process of inter-

and intra-story analyses using storytelling and the meta-framework for dynamic network business processes to contextualise findings.

The following sections synthesise the findings and reflect on the entire research study. Moreover, the researcher outlines the three research questions, as well as the study´s contribution to theory, methodology, and practice. Additionally, the researcher reflects on the limitations of the study and outlines future research directions to advance the field of collaborative food innovation. This thesis concludes with final remarks and personal reflections of the researcher.

7.2 ANSWERING RESEARCH QUESTIONS

7.2.1 Answering RQ1: What is the innovation process for developing plant-based protein products within food startups and SMEs in Germany?

This study provides a nuanced and empirically grounded understanding of the plant-based protein food innovation process. This study captured the complexity and context of the innovation process by applying the meta-framework of dynamic networked business processes (Makkonen, Aarikka-Stenroos and Olkkonen, 2012).

The plant-based protein food innovation process is a multi-level, consumer-driven approach characterised by sequential phases from ideation to commercialisation. This process is characterised by agility and flexibility, allowing for iteration and adaptation at any stage to meet evolving market demands and technological advancements.

The plant-based protein food innovation process primarily yields product and process innovations with a current focus on incremental improvements. However, some startup companies in the sector are progressing towards more radical innovations through the demand for second generation innovation which necessitates novel technological process development.

Efficiency and creativity are the focal events and key success factors of the plant-based protein food innovation process. Efficiency is crucial for profitability and expedites time-

to-market, whereas creativity drives innovativeness. Companies in this study strive to balance these factors and employ various strategies to foster them, including structured project management, collaboration with external actors and internal employee engagement.

Moreover, the plant-based protein food process is significantly influenced by internal and external contextual factors. Internally, the company's maturity, focus on profitability and technological knowledge as a competitive advantage shape its innovation approach. Externally, the rise of plant-based diets, shifting consumer demands and the current lack of political support and clear strategies impact the innovation landscape.

As the plant-based protein food sector evolves, companies face the challenge of balancing consumer centricity with technological advancement. This balance is crucial as the sector moves towards its next developmental stage, which is characterised by more radical innovations and novel technologies.

The study confirms barriers to radical innovation, such as insufficient financing, knowledge transfer and resource allocation. This study revealed the lack of a requisite legal framework and political strategy to support novel food technologies as an additional barrier. Without a clear and supportive policy environment, the potential for radical innovation in the plant-based protein food sector remains constrained.

Conclusively, these findings fulfil the corresponding objective of this study to gain an in-depth and contextual understanding of the plant-based protein food innovation process.

7.2.2 Answering RQ2: How do plant-based protein food startups and SMEs collaborate with their network in the innovation process?

The second research question is answered by examining if and how plant-based protein food companies engage in both internal and external collaborations throughout the innovation process. The individual maps of actors from the restoryings of the individual

micro narratives in Chapter 4 and the synthesised network map (see Figure *5.4*) facilitated the mapping of all actors, as well as the understanding and visualisation of relationships in the innovation process of the plant-based protein food sector.

Openness is elaborated as a prerequisite for collaborative innovation in this study. Moreover, this study identifies a nuanced approach in the plant-based protein food sector, which the researcher termed the “grey zone of openness”. Although open innovation is beneficial, plant-based protein food startups often limit their openness to protect their competitive advantage, especially for more technology-driven plant-based protein food innovation processes.

Moreover, the study highlights that employee, and departmental engagement fosters creativity and knowledge sharing in internal collaboration. Furthermore, the findings suggest that plant-based protein food companies' internal agility and employee engagement promote an open, positive attitude towards external collaboration, which is conducive to enabling external collaboration.

External collaboration occurs throughout the phases of the plant-based protein food innovation process, including ideation, development, and industrial scaling with diverse actors. This is contrary to food innovation literature, which suggests that collaboration exists primarily in the initial and implementation phases. Plant-based protein food companies use both transactional and co-creation collaboration models, with a focus on complementing resources and sharing risks.

The findings outline essential informal relationships along the value chain, such as raw material suppliers, retail companies, consumers and B2B customers. Suppliers provide new knowledge and facilitate networking, while retailers and consumers contribute ideas and feedback.

Horizontal collaboration between plant-based protein food companies is particularly prevalent in the organic sector which is characterised by a lower degree of competitiveness and a higher willingness to share knowledge. Plant-based protein food startups often rely on co-manufacturing with traditional animal-based food companies because of a lack of production capacity.

On the one hand, the two collaboration-in-action cases show that traditional food companies benefit from the agility and creativity of plant-based startups, on the other hand, startups gain structural maturity from established companies. Emotional competence, trust and effective project management are critical for the successful collaboration between traditional and plant-based food companies.

Collaboration with academic institutes and research organisations is essential for accessing technological expertise and facilities; however, it can lead to conflicts between the plant-based protein food company´s need to protect new knowledge and academic interest in publishing findings.

The study also reveals that successful collaborations create mutual benefits, advance a shared vision of sustainability and address economic interests; being on equal footing with mutual trust is identified as an additional enabler of successful collaboration in the plant-based protein food process.

These findings indicate that plant-based protein food companies need to engage in both informal and strategic networking. Currently, informal relationships with suppliers provide valuable knowledge. The researcher concludes from the literature and findings that more strategic networking and relationships along the value chain would support entering the next development stage of the category of more radical innovation. To strengthen strategic networking and relationship building, innovation hubs and political organisations play a fundamental and catalytic role in strategic networking.

However, small plant-based protein food companies often face barriers due to limited human, time, and financial resources. Furthermore, concerns about losing a competitive advantage can limit openness in collaboration, especially when new technologies are involved.

Finally, these insights fulfil the research objective to map the actors and relationships within the network of plant-based protein food startups and SMEs in the innovation process.

7.2.3 Answering RQ3: What capabilities are required to manage the innovation process in the plant-based protein food industry?

This study developed a novel framework of management capabilities required to support collaborative plant-based protein food innovation processes. The framework was derived from narratives and intra- and inter-story analyses (see Figure *6.2*), thus providing a comprehensive response to the third research question.

As demonstrated by the findings, the collaborative nature of the innovation process in the plant-based protein food sector requires strong capabilities in network management, along with the capabilities to manage collaborative relationships. Managers must actively build and maintain networks to enable effective collaborative innovation in the plant-based protein food sector. Personal attributes, such as openness, curiosity, authenticity and willingness to learn, are crucial for networking and building relationships. Maintaining networks requires consistent personal presence and willingness to invest time in sustaining relationships.

Emotional competencies, such as passion, enthusiasm, and the ability to build trust, facilitate effective relationships. Social competencies, including skills in harmonising perspectives, assertiveness, and effective communication support collaborative processes.

Transformational leadership plays a central role in enabling collaborative innovation in the sector by providing psychological safety. Transformational leadership fosters an environment in which employees can grow, develop ownership and responsibility, as well as embrace openness.

In addition, managers need an entrepreneurial understanding to effectively manage human, time, and economic resources. Managers must have a strategic mindset and the ability to shape expectations in collaborative projects.

Moreover, managers must guide the knowledge-transfer process. Balancing knowledge sharing and protection is critical for maintaining a competitive advantage while fostering collaboration.

Finally, managers´ agility and flexibility and the ability to adapt quickly and work efficiently in collaborative settings are increasingly important.

These findings fulfil the research objective to identify the capabilities for the management of the innovation process in the plant-based protein food industry.

The next three sections present this study´s contributions to theory, methodology and praxis.

7.3 CONTRIBUTION TO THEORY

Building on the findings and the discussion, this study makes two primary theoretical contributions to our understanding of the innovation process, collaboration and management capabilities in the plant-based protein food sector: The conceptual model of a "grey zone of openness" and the creation of a framework of management capabilities, comprising the three key themes of transformational leadership, entrepreneurial understanding, and knowledge management.

While the extant literature on food innovation predominantly focuses on SMEs and the traditional food industry, this study extends the theoretical knowledge by offering new insights into collaborative innovation processes and management capabilities specifically in startups and SMEs operating in the emerging plant-based protein food sector.

The conceptualisation of the "grey zone of openness"

A central theoretical contribution of this study is the introduction of the construct of the "grey zone of openness", which conceptualises how plant-based protein food companies strategically balance openness and knowledge protection in their inter-organisational innovation processes. This construct demonstrates that companies do not simply choose between "open" and "closed" innovation. Instead, they operate with a strategic selectivity, depending on the sensitivity of technology and knowledge, perceived competitive risks, and the characteristics of collaborating organisations.

This conceptualisation extends open innovation theory by demonstrating that companies do not adopt openness as a uniform strategy but manage openness strategically and context-dependently across the innovation process.

A framework of management capabilities for collaborative food innovation

The second primary theoretical contribution is a novel framework of management capabilities required for collaborative innovation in the plant-based protein food sector (Figure *6.2*). This framework advances the capability-based view of innovation process management by identifying three key management capabilities required for effective collaborative innovation in the plant-based protein food sector:

Transformational leadership

The study introduces transformational leadership as a key enabler of open innovation in the food sector, expanding its focus beyond structural or technological capabilities. This capability enables leaders to create purpose-driven, trust-rich environments that support openness and creativity in internal and external collaboration. By highlighting the role of transformational leadership, this study contributes to a more nuanced understanding of how managers´ mindsets shape collaborative food innovation processes.

Entrepreneurial understanding

Entrepreneurial understanding reflects managers´ ability to manage company´s resources but also to align expectations in collaborative innovation settings, comprising internal decision making and strategic foresight enabling transformational leadership. This extends existing food innovation literature by identifying how entrepreneurial understanding is enacted in collaborative innovation processes in the plant-based protein food sector.

Knowledge management

Finally, this research positions knowledge management not just as a technical function but also as a strategic capability that underpins successful collaboration.

Moreover, the study empirically demonstrates how emotional and social competencies, such as curiosity, empathy, and openness support learning across organisational

boundaries and enact collaborative innovation processes. These social competencies are often overlooked in traditional capability models.

These insights are particularly relevant, given the food industry's historical reliance on incremental innovation and closed processes. By highlighting the capabilities required to navigate more open, networked and sustainability-oriented innovation processes, this study contributes a more nuanced perspective on how food companies can transition toward more collaborative and impactful innovation practices.

These two primary theoretical contributions directly address the gaps identified in Section 1.3.1, particularly regarding the limited understanding of how collaborative innovation processes unfold and the lack of clarity around management capabilities required for such processes

Contributions addressing the gaps in theoretical knowledge

In addition to these primary theoretical contributions, the study also provides further empirical and conceptual contributions that directly address the literature gaps outlined in Section 1.3.1 through the three RQs of this study (see Table 7.1).

In response to RQ1, the study enriches theoretical understanding of how innovation processes unfold in the plant-based protein food sector by offering a detailed, contextualised account of how startups and SMEs organise and manage innovation processes beyond technological development.

In response to RQ2, the study advances knowledge on collaboration in food innovation by mapping the actors, relationships, and models of collaboration in the plant-based protein food sector, highlighting the strategic role of networked innovation in emerging sustainability- and health-driven sectors.

In response to RQ3, this study addresses the lack of clarity in food innovation literature regarding the capabilities required to manage collaborative innovation by contributing a detailed, context-specific framework of key capabilities advancing current innovation capability literature.

Table 7.1 Alignment of literature gaps with research contributions (own illustration)

Literature Gap	Addressed by	Evidence in Findings
Lack of empirical research into the management of innovation processes in sustainability-driven sector such as plant-based protein food (Aschemann-Witzel, 2015; Tachie, Nwachukwu and Aryee, 2023; Bertello, De Bernardi and Ricciardi, 2024).	RQ1	Section 5.3, 6.2, 7.2.1
Lack of research into collaboration and networked innovation (Procopio Schoen, 2017; Bresciani, 2017; Krasnokutska et al., 2024; Kaplan and McClements, 2025; Magdum *et al.*, 2026)	RQ2	Section 5.4., 6.2, 7.2.2
Unclear management capabilities for collaborative innovation (Procopio Schoen, 2017; Bigliardi et al., 2021)	RQ3	Section 5.5, 6.3, 7.2.3

7.4 CONTRIBUTION TO METHODOLOGY

This study offers a significant methodological contribution by demonstrating the valuable utilisation of a narrative research strategy and application of the framework of dynamic network processes within food business research, particularly in the food innovation context.

Advancing narrative inquiry in business and food innovation research

This study illustrates how narrative strategies and methods can uncover rich and nuanced insights into complex innovation processes. Narrative inquiry enabled the researcher to identify hidden dynamics, capture narrators´ lived experiences and to present the researcher's analyses and interpretation in a story-driven, accessible format that resonates with both academic and non-academic audiences.

Applying and extending the meta-framework of dynamic network processes

The meta-framework of dynamic business network processes employed to synthesise and conceptualise findings in this study offers a straightforward, comprehensive description of how a network process develops (Makkonen, Aarikka-Stenroos and Olkkonen, 2012). This study marks the first application of this meta-framework in plant-bases protein food innovation process research.

Makkonen, Aarikka-Stenroos and Olkkonen (2012) pointed out that the meta-framework is not conceived as a formal, testable model with interconnected concepts and propositions. Rather, its function is to provide a plausible structure that organises the research on network processes. This framework provided a structure for the synthesis and contextualisation of the innovation process derived from individual interview accounts in this study and thus demonstrates its high suitability for the examination of networked food innovation processes.

7.5 CONTRIBUTION TO PRACTICE

This study offers several practical contributions for managers, practitioners and organisations engaged in, or transitioning towards, plant-based protein food innovation. It provides actionable insights into how collaborative innovation can be effectively managed and scaled in a dynamic, sustainability- and health-driven sector.

Enhancing accessibility through storytelling

By applying Clemens´ (2018) storytelling framework to restorying the individual interview accounts, this study enhanced the accessibility of academic findings for non-academic audiences. The presentation of academic findings in narrative form (see Chapter 4) serves as a valuable resource for practitioners. The narrative format enables practitioners, particularly managers in food companies, to critically reflect on their own innovation processes, compare alternative approaches across organisations and identify practical strategies for managing collaboration and innovation. Moreover, Clemens (2018) argued that readers comprehend and retain narrative information more effectively than factual statements.

Several participants expressed appreciation for the opportunity to reflect on their innovation processes through open-ended narration and immanent questioning. This underscores the value of storytelling as a tool for practitioner learning and peer benchmarking.

Practical guidance for traditional food companies

The findings offer targeted guidance for traditional medium-sized and larger food industry companies within the German Mittelstand seeking to transition towards plant-based protein food products.

This study revealed the importance of internal agility, as well as employee and departmental engagement, with both foster a company´s internal creativity, as well as an organisation´s mindset conducive to enabling external collaboration.

These findings are particularly important for companies in the traditional food industry as they emphasise the significance of transformational leadership. Furthermore, the study highlights balancing agility and creativity with operational efficiency to remain competitive and enhance innovativeness.

These insights are particularly relevant for companies navigating the shift from animal- to plant-based protein product lines where organisational culture and leadership style can either enable or constrain innovation efforts.

The additional findings of this study and the newly constructed framework of management capabilities can be utilised to develop workshop programs and guidance for advisors and collaboration facilitators. Moreover, they can assist traditional food companies in their innovation journey towards sustainability and health transformation.

Framework of management capabilities for collaborative innovation

This study introduces a practical framework of management capabilities for collaborative innovation (see *Figure 6.2*) which can serve as a diagnostic and developmental tool for food company leaders. This framework can inform leadership development programs focused on innovation, team building, cross-functional collaboration strategies, partnership and networking-building initiatives within and beyond the sector. Additionally, the framework can support innovation hubs,

accelerators and policy makers in designing targeted structures for startups and SMEs operating in the plant-based food ecosystem.

The following section discusses the research limitations of the narrative strategy and outlines future research avenues. Finally, the researcher's reflections on her study are presented.

7.6 REFLECTION ON THE RESEARCH

Concluding this study, the researcher reflects on the research transferability, limitations and future research directions. Moreover, the researcher finalised this study by noting her personal and professional reflections.

7.6.1 Research transferability

This study´s findings offer a potential transferability to other food innovation contexts where sustainability and health are key drivers and where collaborative innovation is essential. The final conceptual framework of management capabilities and the meta-framework of dynamic network processes may be applicable to other emerging areas such as cultivated protein foods or sustainable packaging innovation. The insights into internal agility and employee engagement as enablers of external collaboration may also inform innovation practices in startups and SMEs across the broader food industry, particularly where radical innovation and network engagement are required.

7.6.2 Research limitations

The study presents scope and methodological limitations which define its boundaries and suggests directions for future research.

Scope limitations

The findings of this study are limited to the plant-based protein food sector in Germany and reflect the perspective of purely plant-based protein food companies. The collaborative relationships were one-sided. The perspective of actors, such as suppliers

or retailers, is not empirically represented, apart from that of two collaborating actors used for corroboration.

Methodological limitations

The use of narrative inquiry offered rich contextualised insights but also introduced certain limitations.

Katz (2013) argued that narrative methods may lead to misrepresentation and pseudoscientific interpretation. Considering this critique, a potential alternative methodology for this study could have been a case study design with semi-structured interviews and purely thematic analysis. This approach may have offered greater transparency and replicability. However, its effectiveness in yielding equally comprehensive results remains unclear.

Elliott (2005) emphasises the narratives are inherently subjective, shaped by individual interpretation rather than offering a direct reflection of empirical reality. They represent a blend of observation and personal meaning-making in relation to the constructs under study.

Additionally, while the typically small purposive sample size of a narrative strategy like that employed in this study facilitates in-depth analysis, it simultaneously restricts generalisability to larger sample groups.

Furthermore, this study was enhanced by employing corroboration across multiple narrative sources, combining micro narratives (interviews) with macro narratives (event documentation). The researcher also added micro narratives from two participants (see Table 3.5), who represent traditional food companies. These accounts offered an alternative perspective on collaborative innovation and served to corroborate the findings from the purely plant-based protein food companies.

The study´s data corroboration approach aligns with Jonsen and Jehn's (2009) broader view of triangulation, which emphasises the value of incorporating diverse perspectives and data sources to validate themes in qualitative research. However, it strengthened the study´s internal credibility but did not fully triangulate across different data types

and actor groups. Future research could enhance robustness by, for example, incorporating multi-actor perspectives or expert focus groups.

Researcher Positionality

The researcher´s professional background in the food industry provided valuable access and contextual understanding, which enriched the study. However, this may have influenced the interpretation. A detailed discussion of the researcher's positionality and role in narrative research is provided in the methodology chapter of this thesis (see Section 3.9).

Although these limitations define the boundaries of this study, they also present valuable opportunities for future research which are discussed in the next section.

7.6.3 Future research avenues

This study addresses several theoretical gaps in the literature, particularly the lack of empirical research on collaborative innovation processes and the requisite management capabilities in the food sector. This study contributes to closing these gaps. This section outlines key avenues for future research, as revealed by this study´s identification of new areas for exploration.

Networked innovation and ecosystem dynamics

This study applied the model of networked innovation as a conceptual lens to understand the network dynamics, actors, and collaborative relationships in the plant-based protein food innovation process. Future studies can examine how network structures evolve and influence innovation outcomes. Additionally, the role of intermediaries, such as innovation hubs, venture capital, and political institutions, as catalysts for networked innovation and collaborative relationship building in the plant-based protein food sector merits further exploration. Triple and Quadruple Helix Models can provide a useful lens for examining these dynamics (De Bernardi and Azucar, 2020; Etzkowitz and Zhou, 2006).

A more comprehensive ecosystem mapping approach, particularly in the upstream agri-food sector, could provide a more holistic understanding of the landscape of potential

collaborative relationships. Such mapping may help to identify latent collaboration opportunities and facilitate the acceleration of more radical innovation pathways.

Management and organisational capabilities for collaborative innovation

This study constructed a framework of management capabilities for collaborative innovation conceptualised in the plant-based protein food sector. Future research could test and refine this framework across different food sectors and company sizes.

Moreover, the findings suggest that internal agility and employee engagement foster a mindset conducive to external collaboration. Future research should investigate whether agility predicts collaboration success, how organisational culture shapes openness to innovation, and how these dynamics vary across company maturity levels.

This thesis concludes with a personal reflection of the researcher.

7.6.4 Researcher´s personal and professional reflection

Embarking on this DBA journey has been an extraordinary experience that has challenged the researcher of this study, both personally and professionally. One of the central findings of this study, "the willingness to embrace change", resonates deeply with the researcher's own motivation for undertaking this academic pursuit. She approached the challenges of the DBA programme to investigate changes across various aspects of her life. Professionally, the DBA journey significantly contributed to her academic development and opened new perspectives for future career pathways. In her private life, it has served as a powerful example for her sons, demonstrating that meaningful professional and personal transformation is possible at any stage of life.

A key driver behind this academic pursuit was the researcher's objective of contributing to the transformation of the food system toward greater sustainability and health. She holds a strong belief in the principles of the planetary health diet and the potential for the plant-based future of food.

Engaging in the narrative interviews with inspiring and authentically committed managers in the plant-based protein food sector was not only methodologically enriching but also personally rewarding. These interactions provided valuable insights

and conveyed a sense of positive energy and purpose that the researcher hopes to carry forward in her professional environment. The knowledge and commitment shared by participants can serve as a catalyst for supporting transformation in the traditional food industry.

The process of conducting this study also deepened the researcher's understanding of reflexivity. Navigating the complexity of narrative analysis presented required a nuanced awareness of the interplay between her own perspective and the data. This journey underscored the importance of maintaining a balance between academic rigour and personal insight. Furthermore, it highlighted the value of reflexivity in qualitative research, particularly when working with narratives rich in personal lived experiences.

As this DBA thesis concludes, the researcher recognises that this academic journey has not only contributed to the body of knowledge in her field but has also marked a profound personal transformation. The skills, insights and perspectives gained will continue to shape her future professional endeavours and personal outlook, reinforcing her commitment.

8 REFERENCE LIST

Ahmad, M. and Wilkins, S. (2025) 'Purposive sampling in qualitative research: a framework for the entire journey', *Quality and Quantity*, 59(2), pp. 1461–1479. Available at: https://doi.org/10.1007/s11135-024-02022-5.

Akhtar, S., Farooqui, A., Younis, K., Mani, A. and Singh, H. (2024) 'Plant proteins for sustainable food production: "Serving present to secure the future"', *International Journal of Food Science & Technology,* 59, pp. 460–461. Available at: https://doi.org/10.1111/ijfs.16807.

Alvesson, M. and Sköldberg, K. (2009) *Reflexive Methodology: New Vistas for Qualitative Research*. 2nd ed. London: Sage.

Ammirato, S. *et al.* (2021) 'Collaborative organization models for sustainable development in the agri-food sector', *Sustainability (Switzerland)*, 13(4), pp. 1–22. Available at: https://doi.org/10.3390/su13042301.

Anderson, J.C., Håkansson, H. and Johanson, J. (1994) 'Dyadic Business Relationships within a Business Network Context', *Journal of Marketing*, 58(4), pp. 1–15. Available at: https://doi.org/10.1177/002224299405800401.

Anderson, V., Fontinha, R. and Robson, F. (2020) *Research Methods in Human Resource Management: Investigating HRM*. 4th edn. London: Kogan Page.

Antonaras, A. and Dekoulou, P.E. (2016) 'Enterprising Culture: Innovation and Value-Network', in *Entrepreneurial Challenges in the 21st Century: Creating Stakeholder Value Co-Creation*. London: Palgrave Macmillan, pp. 94–106. Available at: https://doi.org/10.1057/9781137479761_6.

Aschemann-Witzel, J. *et al.* (2020) 'Plant-based food and protein trend from a business perspective: markets, consumers, and the challenges and opportunities in the future', *Critical Reviews in Food Science and Nutrition*, 61(18), pp. 1–10. Available at: https://doi.org/10.1080/10408398.2020.1793730.

Augustin, M.A. *et al.* (2021) 'Perspective article: Towards a new venture science model for transforming food systems', *Global Food Security*, 28. Available at: https://doi.org/10.1016/j.gfs.2020.100481.

Avermaete, T. *et al.* (2003) 'Determinants of innovation in small food firms', *European Journal of Innovation Management*, 6(1), pp. 8–17.

Axelsson, B. and Easton, Geoff. (2016) 'Industrial networks: a review', in *Industrial Marketing and Purchasing Group: Insights and Research.* London: Routledge, pp. 3–27. Available at: https://doi.org/10.4324/9781315629629-2.

Baregheh, A. *et al.* (2012) 'Innovation in food sector SMEs', *Journal of Small Business and Enterprise Development*, 19(2), pp. 300–321. Available at: https://doi.org/10.1108/14626001211223919.

Bayona-Saez, C. *et al.* (2017) 'Open innovation in the food and beverage industry', *Management Decision*, 55(3), pp. 526–546. Available at: https://doi.org/10.1108/MD-04-2016-0213.

Beckeman, M. and Skjöldebrand, C. (2007) 'Clusters/networks promote food innovations', *Journal of Food Engineering*, 79(4), pp. 1418–1425. Available at: https://doi.org/10.1016/j.jfoodeng.2006.04.024.

Becker, W. *et al.* (2020) *Ökosysteme im Mittelstand*. Wiesbaden: Springer Gabler. Available at: https://doi.org/10.1007/978-3-658-29844-9.

Beham, G. *et al.* (2006) 'Requirements for knowledge management systems: A practitioner's perspective', in *Proceedings of the 7th European Conference on Knowledge Management*. Budapest, Hungary.

De Bernardi, P. and Azucar, D. (2020) 'A European food ecosystem: The EIT food case study', in *Contributions to Management Science*. Cham: Springer, pp. 245–280. Available at: https://doi.org/10.1007/978-3-030-33502-1_9.

Bertello, A., De Bernardi, P. and Ricciardi, F. (2024) 'Open innovation: status quo and quo vadis - an analysis of a research field', *Review of Managerial Science*, 18, pp. 633–683. Available at: https://doi.org/10.1007/s11846-023-00655-8.

Bessant, J. and Tidd, J. (2007) *Innovation and entrepreneurship*. Available at: https://books.google.de/books (Accessed: 14 October 2022).

Bigliardi, B. *et al.* (2020) 'Innovation models in food industry: a review of the literature', *Journal of technology management & innovation*, 15(3), pp. 97–107. Available at: https://doi.org/10.4067/S0718-27242020000300097.

Bigliardi, B. *et al.* (2021) 'The past, present and future of open innovation', *European Journal of Innovation Management*, 24(4), pp. 1130–1161. Available at: https://doi.org/10.1108/EJIM-10-2019-0296.

Bigliardi, B. and Galanakis, C. (2020) 'Innovation management and sustainability in the food industry', in *The Interaction of Food Industry and Environment*. Elsevier, pp. 315–340. Available at: https://doi.org/10.1016/b978-0-12-816449-5.00010-2.

Bigliardi, B. and Galati, F. (2013a) 'Innovation trends in the food industry: The case of functional foods', *Trends in Food Science and Technology*, pp. 118–129. Available at: https://doi.org/10.1016/j.tifs.2013.03.006.

Bigliardi, B. and Galati, F. (2013b) 'Models of adoption of open innovation within the food industry', *Trends in Food Science and Technology*, pp. 16–26. Available at: https://doi.org/10.1016/j.tifs.2012.11.001.

BMEL (2023) *Deutschland, wie es isst: Der BMEL-Ernährungsreport 2023*. Available at: https://www.bmel.de/DE/themen/ernaehrung/ernaehrungsreport2023.html (Accessed: 16 April 2025).

Bocken, N.M.P. *et al.* (2014) 'The front-end of eco-innovation for eco-innovative small and medium sized companies', *Journal of Engineering and Technology*

Management - JET-M, 31(1), pp. 43–57. Available at: https://doi.org/10.1016/j.jengtecman.2013.10.004.

Boddy, C.R. (2016) 'Sample size for qualitative research', *Qualitative Market Research: An International Journal*, 19(4), pp. 426–432. Available at: https://doi.org/10.1108/QMR-06-2016-0053.

Boje, D.M. (2001) *Narrative Methods for Organizational and Communication Research*. London: SAGE Publications.

Bombaywala, M. and Riandita, A. (2015) 'Stakeholders' Collaboration on Innovation in Food Industry', *Procedia - Social and Behavioral Sciences*, 169, pp. 395–399. Available at: https://doi.org/10.1016/j.sbspro.2015.01.325.

Bossle, M.B. *et al.* (2016) 'The drivers for adoption of eco-innovation', *Journal of Cleaner Production*, 113, pp. 861–872. Available at: https://doi.org/10.1016/ j.jclepro.2015.11.076.

Bowser, G. *et al.* (2024) 'Networking and collaborating: the role of partnerships across sectors to achieve educational goals in sustainability', *Sustainable Earth Reviews*, 7(1). Available at: https://doi.org/10.1186/s42055-024-00080-z.

Brand, M. *et al.* (2021) 'Leadership for innovation: A meta-review and future research agenda', *Journal of Innovation & Knowledge*, 6(3), pp. 180–190.

Braun, V. and Clarke, V. (2006) 'Using thematic analysis in psychology', *Qualitative Research in Psychology*, 3(2), pp. 77–101. Available at: https://doi.org/10.1191/1478088706qp063oa.

Braun, V. and Clarke, V. (2019) 'Reflecting on reflexive thematic analysis', *Qualitative Research in Sport, Exercise and Health*. Routledge, pp. 589–597. Available at: https://doi.org/10.1080/2159676X.2019.1628806.

Bresciani, S. (2017) 'Open, networked and dynamic innovation in the food and beverage industry', *British Food Journal*, 119 (12), pp. 2290–2293. Available at: https://doi.org/10.1108/BFJ-08-2017-0458.

Breuer, H. and Lüdeke-Freund, F. (2014) *Normative Innovation for Sustainable Business Models in Value Networks*. Available at: www.ispim.org.

Brewin, D.G., Monchuk, D.C. and Partridge, M.D. (2009) 'Examining the adoption of product and process innovations in the Canadian food processing industry', *Canadian Journal of Agricultural Economics*, 57(1), pp. 75–97. Available at: https://doi.org/10.1111/j.1744-7976.2008.01139.x.

Broad, G.M. (2020) 'Making meat, better: The metaphors of plant-based and cell-based meat innovation', *Environmental Communication*, 14(7), pp. 919–932. Available at: https://doi.org/10.1080/17524032.2020.1725580.

Buhl, A. *et al.* (2019) 'Design thinking for sustainability: Why and how design thinking can foster sustainability-oriented innovation development', *Journal of Cleaner Production*, 231, pp. 1248-1267. Available at: https://doi.org/ 10.1016/ j.jclepro.2019.05.259.

Bulmer, M. (1992) 'The ethics of social research', in M. Bulmer (ed.) *Social Research: Philosophy, Politics and Practice*. London: UCL Press, pp. 3–29.

Bundesverband für Alternative Proteinquellen e.V. (2025) *BALPro – Bundesverband für Alternative Proteinquellen*. Available at: https://balpro.de/ (Accessed: 5 July 2025).

Caiazza, R., Richardson, A. and Audretsch, D.B. (2019) 'Knowledge management and open innovation: A new model', *Journal of Knowledge Management*, 23(10), pp. 2066–2088. Available at: https://doi.org/10.1108/JKM-12-2018-0777.

Capitanio, F., Coppola, A. and Pascucci, S. (2010) 'Product and process innovation in the Italian food industry', *Agribusiness*, 26(4), pp. 503–518. Available at: https://doi.org/10.1002/AGR.20239.

Carson, D. *et al.* (1995) *Marketing and entrepreneurship in SMEs: An innovative approach*. London: Prentice Hall.

Cenamor, J., Parida, V. and Wincent, J. (2019) 'How entrepreneurial SMEs compete through digital platforms: The roles of digital platform capability, network capability and ambidexterity', *Journal of Business Research*, 100, pp. 196–206. Available at: https://doi.org/10.1016/j.jbusres.2019.03.035.

Chandy, R.K. and Tellis, G.J. (1998) 'Organizing for Radical Product Innovation: The Overlooked Role of Willingness to Cannibalize', *Journal of Marketing Research*, 35(4), pp. 474–487. Available at: https://doi.org/10.1177/002224379803500406.

Chase, S.E. (2017) 'Narrative inquiry: Toward theoretical and methodological maturity', in Denzin, N.K. and Lincoln, Y.S. (eds.) *The Sage Handbook of Qualitative Research*. 5th edn. Thousand Oaks, CA: SAGE Publications, pp. 295–334.

Chautard, T. and Collin-Lachaud, I. (2019) 'Introducing the storytelling analysis methodology in marketing: Principles, contributions and implementation', *Recherche et Applications en Marketing*, 34(3), pp. 27–46. Available at: https://doi.org/10.1177/2051570719841225.

Chesbrough, H., Vanhaverbeke, W. and West, J. (2006) *Open innovation: Researching a new paradigm*. USA: Oxford University Press.

Chesbrough, H.W. (2003) *Open Innovation: The New Imperative for Creating and Profiting from Technology*. Boston: Harvard Business School Press.

Christensen, C.M. (2013) *The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail*. Boston, MA: Harvard Business Review Press.

Ciliberti, S., Carraresi, L. and Bröring, S. (2017) 'What drives marketing and organizational innovation in the food industry? A comparison between Italy and Germany', in *Proceedings in System Dynamics and Innovation in Food Networks*.

Clandinin, D.J. (2013) *Engaging in Narrative Inquiry*. Walnut Creek, CA: Left Coast Press.

Clandinin, D.J. and Connelly, F.M. (2000) *Narrative Inquiry: Experience and Story in Qualitative Research*. San Francisco, CA: Jossey-Bass.

Clark, Lisa Frances and Bogdan, A.M. (2019) 'Plant-based foods in Canada: information, trust and closing the commercialization gap', *British Food Journal*, 121(10), pp. 2535–2550. Available at: https://doi.org/10.1108/BFJ-12-2018-0826.

Clark, Lisa F. and Bogdan, A.M. (2019) 'The Role of Plant-Based Foods in Canadian Diets: A Survey Examining Food Choices, Motivations and Dietary Identity', *Journal of Food Products Marketing*, 25(4), pp. 355–377. Available at: https://doi.org/10.1080/10454446.2019.1566806.

Clemens, A. (2018) *Writing a page-turner: how to tell a story in your scientific paper | Impact of Social Sciences*. Available at: https://blogs.lse.ac.uk/impactofsocialsciences/2018/05/21/writing-a-page-turner-how-to-tell-a-story-in-your-scientific-paper/ (Accessed: 1 May 2024).

Cloodt, M. and Vanhaverbeke, W. (2014) *Open Innovation in Value Networks*. Available at: https://www.researchgate.net/publication/228379945.

Coffey, A. and Atkinson, P. (1996) *Making Sense of Qualitative Data: Complementary Research Strategies*. Thousand Oaks, CA: Sage Publications.

Cohen, W.M. and Klepper, S. (1992) 'The trade-off between firm size and diversity in the pursuit of technological progress', *Small Business Economics*, 4(1), pp. 1–14.

Conboy, K. and Fitzgerald, B. (2004) 'Toward a Conceptual Framework of Agile Methods: A Study of Agility in Different Disciplines', Proceedings *of the 2004 International Conference on Extreme Programming and Agile Processes in Software Engineering.* Berlin: springer.

Consoli, D. and Elche, D. (2014) 'An analysis of the knowledge base of scientific research and development business services', *R and D Management*, 44(4), pp. 341–354. Available at: https://doi.org/10.1111/radm.12062.

Contini, C. *et al.* (2020) 'Drivers of plant-based convenience foods consumption: Results of a multicomponent extension of the theory of planned behaviour', *Food Quality and Preference*, 84. Available at: https://doi.org/10.1016/j.foodqual.2020.103931.

Cooper, R.G. and Kleinschmidt, E.J. (1991) 'The impact of product innovativeness on performance', *Journal of Product Innovation Management*, 8(4), pp. 240–251.

Costa, A.I.A. and Jongen, W.M.F. (2006) 'New insights into consumer-led food product development', *Trends in Food Science and Technology*, 17(8), pp. 457–465. Available at: https://doi.org/10.1016/j.tifs.2006.02.003.

Creswell, J.W. (2016) *Qualitative inquiry and research design: Choosing among five approaches*. 4th ed. Thousand Oaks, CA: SAGE Publications.

Crick, J.M. (2021) 'Qualitative research in marketing: what can academics do better?', *Journal of Strategic Marketing*, 29(5), pp. 390–429. Available at: https://doi.org/10.1080/0965254X.2020.1743738.

Czarniawska, B. (2004) *Narratives in Social Science Research*. London: Sage.

Daiute, C. (2014) *Narrative Inquiry: A Dynamic Approach*. Thousand Oaks, CA: SAGE Publications.

Damanpour, F. and Schneider, M. (2009) 'Characteristics of innovation and innovation adoption in public organizations: Assessing the role of managers', *Journal of Public Administration Research and Theory*, 19(3), pp. 495–522. Available at: https://doi.org/10.1093/jopart/mun021.

Deiters, J. and Schiefer, G. (2012) 'Network Learning and Innovation in SME Formal Networks, Int. J. Food System Dynamics', *International Journal on Food System Dynamics*, 3(3), pp.214-225. Available at: https://www.fooddynamics.org.

Distanont, A. and Khongmalai, O. (2020) 'The role of innovation in creating a competitive advantage', *Kasetsart Journal of Social Sciences*, 41(1), pp. 15–21. Available at: https://doi.org/10.1016/j.kjss.2018.07.009.

Dosi, G. (1982) 'Technological paradigms and technological trajectories: A suggested interpretation of the determinants and directions of technical change', *Research Policy*, 11(3), pp. 147–162. Available at: https://doi.org/10.1016/0048-7333(82)90016-6.

Easterby-Smith, M., Thorpe, R. and Jackson, P.R. (2018) *Management research*. 5th ed. London: SAGE Publications.

Eftekhari, N. and Bogers, M. (2015) 'Open for Entrepreneurship: How Open Innovation Can Foster New Venture Creation', *Creativity and Innovation Management*, 24(4), pp. 574–584. Available at: https://doi.org/10.1111/caim.12136.

Elliott, J. (2005) *Using Narrative in Social Research: Qualitative and Quantitative Approaches*. SAGE Publications.

Enkel, E., Gassmann, O. and Chesbrough, H. (2009) 'Open R&D and open innovation: Exploring the phenomenon', *R&D Management*, 39(4), pp. 311–316. Available at: https://doi.org/10.1111/j.1467-9310.2009.00570.x.

Etzkowitz, H. and Zhou, C. (2006) 'Triple Helix twins: innovation and sustainability', *Science and Public Policy*, 33(1), pp. 77–83. Available at: https://doi.org/10.3152/147154306781779088.

Euromonitor International (2020) *Plant-Based Eating and Alternative Proteins*. Available at: https://www.euromonitor.com/.

European Commission (2020) *Farm to Fork Strategy: For a Fair, Healthy and Environmentally Friendly Food System.* Available at: https://ec.europa.eu/food/farm2fork_en (Accessed: 20 April 2025).

European Commission (2021) *EU code of conduct on responsible food business and marketing practices: A common aspirational path towards sustainable food systems*. Available at: https://food.ec.europa.eu/system/files/2021-06/f2f_sfpd_coc_final_en.pdf (Accessed: 18 August 2025).

European Commission (2025) *Food 2030*. Available at: https://research-and-innovation.ec.europa.eu/research-area/environment/bioeconomy/food-systems/food-2030_en (Accessed: 20 April 2025).

European Commission: Directorate-General for Internal Market Entrepreneurship and SMEs (2020) *User guide to the SME definition*. Luxembourg: Publications Office of the European Union. Available at: https://doi.org/doi/10.2873/255862.

van Fossen, K.E. (2018) *Cultivating Healthy Food Ventures: The Business Model Perspective*. Available at: doi:10.17863/CAM.32370 (Accessed: 18 August 2024).

Francis, D. and Bessant, J. (2005) 'Targeting innovation and implications for capability development', *Technovation*, 25(3), pp. 171–183. Available at: https://doi.org/10.1016/j.technovation.2004.03.004.

Franco, C. and Landini, F. (2022) 'Organizational drivers of innovation: The role of workforce agility', *Research Policy*, 51(2). Available at: https://doi.org/10.1016/j.respol.2021.104423.

Freel, M.S. (2000) 'External linkages and product innovation in small manufacturing firms', *Entrepreneurship & Regional Development*, 12(3), pp. 245–266.

Gabriel, Y. (1998) 'The uses of stories', in G. Symon and C. Cassell (eds.) *Qualitative Methods and Analysis in Organizational Research*. London: Sage, pp. 135–160.

Gabriel, Y. (2000) *Storytelling in Organizations: Facts, Fictions, and Fantasies*. Oxford: Oxford University Press.

Gabriel, Y. and Griffiths, D.S. (2004) 'Stories in organizational research', in C. Cassell and G. Symon (eds.) *Essential Guide to Qualitative Methods in Organizational Research*. London: Sage, pp. 114–126.

Galanakis (2021) *Innovation Strategies in the Food Industry: Tools for Implementation*. 2nd ed. London: Academic Press.

Galizzi, G. and Venturini, L. (1996) *Economics of innovation: The case of food industry*. Heidelberg: Physica-Verlag.

Le Gallais, T. (2008) 'Wherever I go there I am: reflections on reflexivity and the research stance', *Reflective Practice*, 9(2), pp. 145–155. Available at: https://doi.org/10.1080/14623940802005475.

Garcia Martinez, M. and Briz, J. (2000) 'Innovation in the Spanish food & drink industry', *The International Food and Agribusiness Management Review*, 3(2), pp. 155–176. Available at: https://doi.org/10.1016/S1096-7508(00)00033-1.

Gassmann, O., Enkel, E. and Chesbrough, H. (2010) 'The future of open innovation', *R and D Management*, pp. 213–221. Available at: https://doi.org/10.1111/j.1467-9310.2010.00605.x.

Gazdecki, M., Leszczyński, G. and Zieliński, M. (2021) 'Food sector as an interactive business world: A framework for research on innovations', *Energies*, 14(11). Available at: https://doi.org/10.3390/en14113312.

Geissdoerfer, M. *et al.* (2018) 'Product, service, and business model innovation: A discussion', *Procedia Manufacturing*, 21, pp. 165–172. Available at: https://doi.org/10.1016/J.PROMFG.2018.02.107.

Geissdoerfer, M., Bocken, N.M.P. and Hultink, E.J. (2016) 'Design thinking to enhance the sustainable business modelling process – A workshop based on a value mapping process', *Journal of Cleaner Production*, 135, pp. 1218–1232. Available at: https://doi.org/10.1016/J.JCLEPRO.2016.07.020.

Geissdoerfer, M., Vladimirova, D. and Evans, S. (2018) 'Sustainable business model innovation: A review', *Journal of Cleaner Production*, 198, pp. 401–416. Available at: https://doi.org/10.1016/J.JCLEPRO.2018.06.240.

Gellynck, X. and Vermeire, B. (2009) 'Strategic orientation rounds: a FOOD-Cluster synthesis', in *Proceedings of the 3rd Official Meeting of the Food Cluster*. Available at: http://hdl.handle.net/1854/LU-677013 (Accessed: 8 July 2025).

Germany Trade and Invest (2021) *The Food & Beverage Industry in Germany*. Berlin. Available at: https://www.gtai.de/en/invest/service/publications/the-food-beverage-industry-in-germany-63994 (Accessed: 13 May 2023).

Giddens, A. (1984) *The Constitution of Society: Outline of the Theory of Structuration*. Berkeley: University of California Press.

Giorgi, A. (2010) 'Phenomenology and the practice of science', *Journal of the Society for Existential Analysis*, 21(1), pp. 3–22.

Giudice, M. del and Maggioni, V. (2014) 'Managerial practices and operative directions of knowledge management within inter-firm networks: A global view', *Journal of Knowledge Management*, 18(5), pp. 841–846. Available at: https://doi.org/10.1108/JKM-06-2014-0264.

Good Food Institute (GFI) (2022) State of Global Policy Report 2022. Available at: https://gfi.org/wp-content/uploads/2023/01/State-of-Global-Policy-Report_2022.pdf

Good Food Institute Europe (GFI) (2023) 'State of the industry report Deutschland 2022: alternative Proteine in Deutschland: The Good Food Institute Europe.' Available at: https://gfieurope.org/de/ (Accessed: 16 April 2025).

Gray, D.E. (2004) *Doing Research in the Real World*. London: Sage.

Groenewald, T. (2004) 'A phenomenological research design illustrated', *International Journal of Qualitative Methods*, 3(1), pp. 42–55.

Grünert, K. *et al.* (1997) 'A framework for analysing innovation in the food sector', in Traill, B. and Grunert, K.G. (eds.) *Product and process innovation in the food sector*. London: Chapman & Hall, pp. 1–33.

Grunert, K.G. *et al.* (2005) 'Market orientation of value chains: A conceptual framework based on four case studies from the food industry', *European Journal of Marketing*, 39(5–6), pp. 428–455. Available at: https://doi.org/10.1108/03090560510590656.

Guba, E.G. and Lincoln, Y.S. (1989) *Fourth Generation Evaluation*. Newbury Park, CA: Sage.

Gumusluoğlu, L. and Ilsev, A. (2009) 'Transformational leadership, creativity, and organizational innovation', *Journal of Business Research*, 62(4), pp. 461–473. Available at: https://doi.org/10.1016/j.jbusres.2007.07.032.

Håkansson, H. and Snehota, I. (1989) 'No business is an island: The network concept of business strategy', *Scandinavian Journal of Management*, 5(3), pp. 187–200. Available at: https://doi.org/10.1016/0956-5221(89)90026-2.

Hamilton, K., Dunnett, S. and Downey, H. (2012) 'Researcher identity: Exploring the transformatory power of the research experience', *Journal of Consumer Behaviour*, 11(4), pp. 275–282. Available at: https://doi.org/10.1002/cb.1386.

Harryson, S.J., Dudkowski, R. and Stern, A. (2008) 'Transformation networks in innovation alliances – The development of Volvo C70', *Journal of Management Studies*, 45(4), pp. 745–773. Available at: https://doi.org/10.1111/j.1467-6486.2008.00766.x.

Hauschildt, J. and Salomo, S. (2011) *Innovationsmanagement*. 5th edn. München: Vahlen.

Hayes, R.H. and Abernathy, W.J. (1980) 'Managing Our Way to Economic Decline', *Harvard Business Review*, 58(4), pp. 67–77.

Hefferon, K.L., De Steur, H., Perez-Cueto, F.J.A. and Herring, R. (2023) 'Alternative protein innovations and challenges for industry and consumer: an initial overview', *Frontiers in Sustainable Food Systems*, 7. Available at: https://doi.org/10.3389/fsufs.2023.1038286.

Hoek, A.C. *et al.* (2011) 'Replacement of meat by meat substitutes. A survey on person- and product-related factors in consumer acceptance', *Appetite*, 56(3), pp. 662–673. Available at: https://doi.org/10.1016/j.appet.2011.02.001.

Holman, P., Devane, T. and Cady, S. (2017) *The Change Handbook: The Definitive Resource on Today's Best Methods for Engaging Whole Systems*. Oakland, CA: Berrett-Koehler Publishers.

Huber, J. and Whelan, K. (1999) 'A marginal story as a place of possibility: negotiating self on the professional knowledge landscape', *Teaching and Teacher Education*, 15(4), pp. 381–396. Available at: https://doi.org/10.1016/S0742-051X(98)00048-1.

Hussain, M.A. and Li, L. (2025) 'Novel proteins for future foods: current status, challenges, and perspectives', *Foods*, 14(5), 862. Available at: https://doi.org/10.3390/foods14050862.

Iansiti, M. and Levien, R. (2004) *The Keystone Advantage: What the New Dynamics of Business Ecosystems Mean for Strategy, Innovation, and Sustainability*. Boston: Harvard Business School Press.

Iphofen, R. (2011) *Ethical Decision Making in Social Research: A Practical Guide*. Palgrave Macmillan.

Jonsen, K. and Jehn, K.A. (2009) 'Using triangulation to validate themes in qualitative studies', *Qualitative Research in Organizations and Management: An International Journal*, 4(2), pp. 123–150. Available at: https://doi.org/10.1108/17465640910978391.

Kakar, Z.U.H. *et al.* (2023) 'Criteria for assessing and ensuring the trustworthiness in qualitative research', *International Journal of Business Reflections*, 4(2), pp. 150–173. Available at: https://doi.org/10.56249/ijbr.03.01.44.

Kapadia, S. and Warren, V. (2022) 'The Integration of Sustainability and Shared Value in the Business Model: evidence from multi-sectoral cases', *International Journal of Professional Management*, 17(3), pp. 1–15. Available at: https://ipmajournal.com/articles/Vol17_Iss3_Article5.php (Accessed: 18 August 2025).

Kaplan, D.L. and McClements, D.J. (2025) 'Hybrid alternative protein-based foods: designing a healthier and more sustainable food supply', *Frontiers in Science*, 3, 1599300. Available at: https://doi.org/10.3389/ fsci.2025.1599300.

Katz, Y. (2013) 'Against storytelling of scientific results', *Nature Methods*, 10(11), p. 1045. Available at: https://doi.org/10.1038/nmeth.2700.

Kaufmann, H.R. *et al.* (2012) 'Corporate branding and transformational leadership in turbulent times', *Journal of Product and Brand Management*, 21(3), pp. 192–204. Available at: https://doi.org/10.1108/10610421211228810.

Kaufmann, H.R. and Shams, S.M.R. (2016) *Entrepreneurial Challenges in the 21st Century: Creating Stakeholder Value Co-Creation*. London: Palgrave Macmillan. Available at: https://doi.org/10.1057/9781137479761/COVER.

Kaur, S.P., Sagar, N.A. and Rani, N. (2025) 'Alternative proteins: innovations in sources, processing, and consumption', *Frontiers in Sustainable Food Systems*, 9, 1641712. Available at: https://doi.org/10.3389/ fsufs.2025.1641712.

Kline, S.J. and Rosenberg, N. (1986) 'An overview of innovation', in R. Landau and N. Rosenberg (eds.) *The Positive Sum Strategy: Harnessing Technology for Economic Growth*. Washington, D.C.: National Academy Press, pp. 275–305.

Knudsen, C.S. (2003) 'Pluralism, scientific progress, and the structure of organization theory', in H. Tsoukas and C. Knudsen (eds.) *The Oxford Handbook of Organization Theory*. Oxford: Oxford University Press, pp. 262–286.

Kotler, P., Keller, K.L. and Chernev, A. (2025) *Marketing Management*. 17th ed. London: Pearson.

Krasnokutska, N. *et al.* (2024) 'Open innovation for sustainability in the agri-food sector: why, who and how?', *European Journal of Innovation Management*, early view. Available at: https://doi.org/10.1108/EJIM-09-2023-0766.

Kwong, C.C.Y. *et al.* (2012) 'The role of environment in fostering conductive entrepreneurial learning: Teaching the "art" of entrepreneurship in boot camps', *Journal of General Management*, 38(1), pp. 45–71. Available at: https://doi.org/10.1177/030630701203800103.

Lee, S. *et al.* (2010) 'Open innovation in SMEs—An intermediated network model', *Research Policy*, 39(2), pp. 290–300. Available at: https://doi.org/10.1016/ j.respol.2009.12.009.

Lefebvre, V.M., Steur, H. De and Gellynck, X. (2015) 'External sources for innovation in food SMEs', *British Food Journal*, 117(1), pp. 412–430. Available at: https://doi.org/10.1108/BFJ-09-2013-0276.

Leitão, J., Pereira, D. and de Brito, S. (2020) 'Inbound and outbound practices of open innovation and eco-innovation: Contrasting bioeconomy and non-bioeconomy firms', *Journal of Open Innovation: Technology, Market, and Complexity*, 6(4), pp. 1–34. Available at: https://doi.org/10.3390/joitmc6040145.

Leitzmann, C. and Keller, M. (2020) *Vegetarische und vegane Ernährung*. 4th ed. Stuttgart: UTB.

Lichtenthaler, U. (2008) 'Open innovation in practice: An analysis of strategic approaches to technology transactions', *IEEE Transactions on Engineering Management*, 55(1), pp. 148–157. Available at: https://doi.org/10.1109/ TEM.2007.912932.

Lincoln, Y.S. and Guba, E.G. (1985) *Naturalistic Inquiry*. SAGE Publications.

Lincoln, Y.S., Lynham, S.A. and Guba, E.G. (2011) 'Paradigmatic controversies, contradictions, and emerging confluences, revisited', in Denzin, N.K. and Lincoln, Y.S. (eds.) *The SAGE Handbook of Qualitative Research.* 4th edn. Thousand Oaks, CA: Sage Publications, pp. 97–128.

Lüdeke-Freund, F. (2010) 'Towards a conceptual framework of business models for sustainability', in *Proceedings of the Knowledge Collaboration & Learning for Sustainable Innovation Conference (ERSCP-EMSU)*. Delft: Leuphana University of Lüneburg. Available at: https://www.researchgate.net/ publication/302373697 (Accessed: 10 February 2022).

Lurie-Luke, E. (2024) 'Alternative protein sources: science-powered startups to fuel food innovation', *Nature Communications*, 15, 47091. Available at: https://doi.org/10.1038/s41467-024-47091-0.

Magdum, A.B., Shinde, K.V., Jadhav, N.K., Jagtap, M.A., Patil, S.A. and Nimbalkar, M.S. (2026) 'Plant-based proteins: functional, nutritional, and technological advances for sustainable food systems', *European Food Research and Technology*, 252, 48. Available at: https://doi.org/10.1007/s00217-025-04933-5.

Makkonen, H., Aarikka-Stenroos, L. and Olkkonen, R. (2012) 'Narrative approach in business network process research - Implications for theory and methodology', *Industrial Marketing Management*, 41(2), pp. 287–299. Available at: https://doi.org/10.1016/j.indmarman.2012.01.012.

Manzini, R., Lazzarotti, V. and Pellegrini, L. (2017) 'How to Remain as Closed as Possible in the Open Innovation Era: The Case of Lindt & Sprüngli', *Long Range Planning*, 50(2), pp. 260–281. Available at: https://doi.org/10.1016/J.LRP.2015.12.011.

de Marchi, V., Molina-Morales, F.X. and Martínez-Cháfer, L. (2022) 'Environmental innovation and cooperation: A configurational approach', *Technological Forecasting and Social Change*, 182. Available at: https://doi.org/10.1016/j.techfore.2022.121835.

Maurer, C. and Valkenburg, R. (2014) 'Approaches to networked innovation', *International Journal of Innovation and Technology Management*, 11(1). Available at: https://doi.org/10.1142/S0219877014400045.

McCall, B. *et al.* (2019) 'Storytelling as a research tool and intervention around public health perceptions and behaviour: A protocol for a systematic narrative review', *BMJ Open*, 9(12). Available at: https://doi.org/10.1136/bmjopen-2019-030597.

Meissner, D. and Kotsemir, M. (2015) 'Conceptualizing the innovation process towards the "active innovation paradigm"—trends and outlook', *Journal of Innovation and Entrepreneurship*, 5(1). Available at: https://doi.org/10.1186/s13731-016-0042-z.

Mendoza-Silva, A. (2020) 'Innovation capability: a systematic literature review', *European Journal of Innovation Management, 24(3),* pp. 707–734. Available at: https://doi.org/10.1108/EJIM-09-2019-0263.

Menrad, K. (2004) 'Innovations in the food industry in Germany', *Research Policy*, 33(6–7), pp. 845–878. Available at: https://doi.org/10.1016/j.respol.2004.01.012.

Menrad, K. and Feigl, S. (2007) *Innovations in Traditional Food Products in Small and Medium-Sized Companies of the Food Industry: Review of literature*. Straubing: Technologie- und Förderzentrum (TFZ). Available at: https://www.researchgate.net/ publication/237556312 (Accessed: 16 April 2022).

Moustakas, C. (1994) *Phenomenological Research Methods*. Thousand Oaks, CA: SAGE Publications.

Mowery, D.C. and Rosenberg, N. (1998) *Paths of innovation: Technological change in 20th-century America*. Cambridge: Cambridge University Press.

Myers, S. and Marquis, D.G. (1969) *Successful industrial innovations: A study of factors underlying innovation in selected firms*. Washington, D.C.: National Science Foundation.

Neneh, B. (2012) 'An exploratory study on entrepreneurial mindset in the small and medium enterprise (SME) sector: A South African perspective on fostering small and medium enterprise (SME) success', *African Journal of Business Management*, 6(9), pp. 3364–3372.

Nidumolu, R., Prahalad, C.K. and Rangaswami, M.R. (2009) 'Why Sustainability Is Now the Key Driver of Innovation', *Harvard Business Review*, 87(9), pp. 57–64.

Available at: https://hbr.org/2009/09/why-sustainability-is-now-the-key-driver-of-innovation (Accessed: 16 April 2025).

Niesten, E. and Jolink, A. (2020) 'Motivations for Environmental Alliances: Generating and Internalizing Environmental and Knowledge Value', *International Journal of Management Reviews*, 22(4), pp. 356–377. Available at: https://doi.org/10.1111/ijmr.12228.

Niglas, K. (2010) 'Philosophical foundations of research methodology: An integrated set of continua', in A. Tashakkori and C. Teddlie (eds.) *SAGE Handbook of Mixed Methods in Social & Behavioral Research*. 2nd ed. Thousand Oaks, CA: SAGE Publications, pp. 215–242.

Nutrition Hub (2025) *Trendreport Ernährung 2025: Es wird gesund, flexibel und selbstbestimmt*. Available at: https://www.nutrition-hub.de/post/trendreport-ernaehrung-trends-2025.

Nyimbili, F. and Nyimbili, L. (2024) 'Types of Purposive Sampling Techniques with Their Examples and Application in Qualitative Research Studies', *British Journal of Multidisciplinary and Advanced Studies*, 5(1), pp. 90–99. Available at: https://doi.org/10.37745/bjmas.2022.0419.

Oke, A., Burke, G. and Myers, A. (2007) 'Innovation types and performance in growing UK SMEs', *International Journal of Operations and Production Management*, pp. 735–753. Available at: https://doi.org/10.1108/01443570710756974.

Ollila, S. and Yström, A. (2017) 'An investigation into the roles of open innovation collaboration managers', *R and D Management*, 47(2), pp. 236–252. Available at: https://doi.org/10.1111/radm.12197.

Olsen, N.V. (2015) 'Design Thinking and food innovation', *Trends in Food Science & Technology*, 41(2), pp. 182–187. Available at: https://doi.org/10.1016/J.TIFS.2014.10.001.

Omta, S.W.F. and Folstar, P. (2005) 'Integration of innovation in the corporate strategy of agri-food companies', in W.M.F. Jongen and M.T.G. Meulenberg (eds.) *Innovation in Agri-Food Systems: Product Quality and Consumer Acceptance*. Wageningen: Wageningen Academic Publishers, pp. 221–243.

Paltridge, B. and Starfield, S. (2007) *Thesis and Dissertation Writing in a Second Language: A Handbook for Supervisors*. London: Routledge.

Parida, V. *et al.* (2016) 'Network capability, innovativeness, and performance: a multidimensional extension for entrepreneurship', *Entrepreneurship & Regional Development*, 29(1–2), pp. 94–115. Available at: https://doi.org/10.1080/08985626.2016.1255434.

Parida, V., Sjödin, D. and Reim, W. (2019) 'Reviewing literature on digitalization, business model innovation, and sustainable industry: Past achievements and future promises', *Sustainability*, 11(2), p. 391. Available at: https://doi.org/10.3390/su11020391.

Parida, V., Westerberg, M. and Frishammar, J. (2012) 'Inbound open innovation activities in high-tech SMEs: The impact on innovation performance', *Journal of Small Business Management*, 50(2), pp. 283–309. Available at: https://doi.org/10.1111/j.1540-627X.2012.00354.x.

Pentland, B.T. (1999) 'Building process theory with narrative: from description to explanation', *Academy of Management Review*, 24(4), pp. 711–724. Available at: https://doi.org/10.5465/amr.1999.2553249.

Peppard, J. and Rylander, A. (2006) 'From Value Chain to Value Network:. Insights for Mobile Operators', *European Management Journal*, 24(2–3), pp. 128–141. Available at: https://doi.org/10.1016/j.emj.2006.03.003.

Pisano, G.P. and Verganti, R. (2008) 'Which Kind of Collaboration Is Right for You?', *Harvard Business Review*, 86(12), pp. 78–86. Available at: https://hbr.org/2008/12/which-kind-of-collaboration-is-right-for-you (Accessed: 16 April 2025).

Pittaway, L. *et al.* (2004) 'Networking and innovation: A systematic review of the evidence', *International Journal of Management Reviews*, 5–6(3–4), pp. 137–168. Available at: https://doi.org/10.1111/J.1460-8545.2004.00101.X.

Pleschak, F. and Sabisch, H. (1996) *Innovationsmanagement*. Stuttgart: Schäffer-Poeschel.

Polkinghorne, D.E. (1995) 'Narrative configuration in qualitative analysis', *International Journal of Qualitative Studies in Education*, 8(1), pp. 5–23. Available at: https://doi.org/10.1080/0951839950080103.

Porter, M.E. (2011) *Creating Shared Value: Redefining Capitalism and the Role of the Corporation in Society*. Available at: www.isc.hbs.edu.

Procopio Schoen, A. (2017) 'Openness and collaboration in the food sector: mapping the field', *British Food Journal*. Emerald Group Publishing Ltd., pp. 2493–2506. Available at: https://doi.org/10.1108/BFJ-03-2017-0126.

Profeta, A., Märdian, A. and Wolfram, C. (2021) *Deutscher Innovationsreport Food 2021*. Quakenbrück and Gauting. Available at: https://www.dil-ev.de/fileadmin/dil-ev/Publikationen/Deutscher_Innovationsreport_Food_2021.pdf.

Przyborski, A. and Wohlrab-Sahr, M. (2013) *Qualitative Sozialforschung: Ein Arbeitsbuch.* 3rd edn. Wiesbaden: Springer VS.

Rama, R. and von Tunzelmann, N. (2008) 'Empirical studies of innovation in the food and beverage industry', in Rama, r. (ed.) *Handbook of Innovation in the Food and Drink Industry*. New York: CRC Press, pp. 13–49. Available at: https://doi.org/10.1201/9781482277838-4.

Rauter, R., Baumgartner, R.J. and Perl-Vorbach, E. (2017) 'Is open innovation supporting sustainable innovation? Findings based on a systematic, explorative analysis of existing literature', *International Journal of Innovation and Sustainable*

Development, 11(2/3), pp. 249–260. Available at: https://doi.org/10.1504/IJISD.2017.083289.

Reed, M.I. (2009) 'Critical realism: Philosophy, method or philosophy in search of a method?', in D. Buchanan and A. Bryman (eds.) *The SAGE Handbook of Organizational Research Methods*. London: SAGE Publications, p. 430.

Reissner, S.C. (2008) *Narratives of Organisational Change and Learning: Making Sense of Testing Times*. Cheltenham: Edward Elgar Publishing.

Riccaboni, A. *et al.* (2021) 'Sustainability-oriented research and innovation in "farm to fork" value chains', *Current Opinion in Food Science*. Elsevier Ltd, pp. 102–112. Available at: https://doi.org/10.1016/j.cofs.2021.04.006.

Ricciotti, F. (2020) 'From value chain to value network: a systematic literature review', *Management Review Quarterly*, 70(2), pp. 191–212. Available at: https://doi.org/10.1007/s11301-019-00164-7.

Ricœur, P. (1990) *Time and Narrative, Volume 1*, *Time and Narrative*. Chicago: University of Chicago Press.

Riessman, C.K. (2002) *Narrative Analysis*. Newbury Park, CA: SAGE Publications.

Riessman, C.K. (2008) *Narrative Methods for the Human Sciences*. Thousand Oaks, CA: SAGE Publications.

Ritchie, J. *et al.* (2013) *Qualitative Research Practice: A Guide for Social Science Students and Researchers*. 2nd ed. London: SAGE Publications.

Rockström, J. et al. (2025) 'The EAT–Lancet Commission on healthy, sustainable, and just food systems', *The Lancet*, 406, pp. 1625–1700. Available at: https://doi.org/10.1016/S0140-6736(25)01201-2.

Roberts, J. and Sims, S. (2017) 'Narrative, narrative identity, and ethnographic responsibility', *Qualitative Research Journal*, 17(3), pp. 230–241.

Rock, K., Friedrich, J. and Zscheischler, J. (2025) 'Agricultural startups' visions of a sustainable agri-food future: a comparative case study in rural and urban Germany', *Agriculture and Human Values* [Preprint]. Available at: https://doi.org/10.1007/s10460-025-10750-z.

Röhl, K.-H. and Engels, B. (2020) *Cooperation of start-ups and SMEs in Germany: Chances, challenges and recommendations*, *IW Policy Paper No. 19/2020*. Institut der deutschen Wirtschaft. Available at: https://www.econstor.eu/bitstream/10419/224772/1/1733925406.pdf.

Rothwell, R. (1992) 'Successful industrial innovation: Critical factors for the 1990s', *R&D Management*, 22(3), pp. 221–239.

Rothwell, R. and Zegveld, W. (1985) *Reindustrialization and technology*. Armonk, NY: M.E. Sharpe.

Rzegotta, I. (2024) 'Auf dem Weg aus der Nische? Entwicklung des Plant-Based-Marktes in Deutschland und Europa', in *Smart Protein Summit 2024*. Berlin: Good Food

Institute Europe. Available at: https://www.gfieurope.de (Accessed: 16 April 2025).

Saari, U.A. *et al.* (2021) 'The vegan trend and the microfoundations of institutional change: A commentary on food producers' sustainable innovation journeys in Europe', *Trends in Food Science and Technology*. Elsevier Ltd, pp. 161–167. Available at: https://doi.org/10.1016/j.tifs.2020.10.003.

Sadat, S.H. and Nasrat, S. (2020) 'The Practice of Open Innovation by SMEs in the Food Industry', *Journal of Innovation Management*, 8(2), pp. 26–46. Available at: https://doi.org/10.24840/2183-0606_008.002_0004.

Saguy, I.S. and Sirotinskaya, V. (2014) 'Challenges in exploiting open innovation's full potential in the food industry with a focus on small and medium enterprises (SMEs)', *Trends in Food Science and Technology*. Elsevier Ltd, pp. 136–148. Available at: https://doi.org/10.1016/j.tifs.2014.05.006.

Sarkar, S. and Costa, A.I.A. (2008) 'Dynamics of open innovation in the food industry', *Trends in Food Science and Technology*, 19(11), pp. 574–580. Available at: https://doi.org/10.1016/j.tifs.2008.09.006.

Saunders, M. (2012) 'Choosing research participants', in G. Symon and C. Cassell (eds.) *Qualitative Organizational Research: Core Methods and Current Challenges*. London: SAGE Publications Ltd, pp. 35–52. Available at: https://doi.org/10.4135/9781526435620.n3.

Saunders, M., Lewis, P. and Thornhill, A. (2024) *Research Methods for Business Students*. 9th ed. Harlow: Pearson Education.

Schütze, F. (1978) *Die Technik des narrativen Interviews in Interaktionsfeldstudien – dargestellt an einem Projekt zur Erforschung von kommunalen Machtstrukturen*. Bielefeld: Universität Bielefeld.

Schwandt, T.A. (2007) *Qualitative Inquiry: A Dictionary of Terms*. 2nd ed. SAGE Publications.

Senker, J. (1995) 'Tacit knowledge and models of innovation', *Industrial and Corporate Change*, 4(2), pp. 425–447. Available at: https://doi.org/10.1093/icc/4.2.425.

Shannon-Baker, P. (2023) 'Philosophical underpinnings of mixed methods research in education', in R. Tierney, F. Rizvi, and K. Ercikan (eds.) *International Encyclopedia of Education*. 4th ed. Amsterdam: Elsevier, pp. 380–389. Available at: https://doi.org/10.1016/B978-0-12-818630-5.11037-1.

Singh, V. and Tomar, R. (2023) 'The role of storytelling as an analytical tool in scientific research', in *Proceedings of the Design Society*. Cambridge University Press, pp. 3483–3492. Available at: https://doi.org/10.1017/pds.2023.349.

Smart Protein Project (2021) *Plant-based foods in Europe: How big is the market?* Available at: https://smartproteinproject.eu/wp-content/uploads/Smart-Protein-Plant-based-Food-Sector-Report.pdf.

Sodano, V. (2019) 'Innovation trajectories and sustainability in the food system', *Sustainability*, 11(5), p. 1271. Available at: https://doi.org/10.3390/su11051271.

Statistisches Bundesamt (Destatis) (2024) *Business register – German Federal Statistical Office*. Available at: https://www.destatis.de/EN/Themes/Economic-Sectors-Enterprises/Enterprises/Business-Register/_node.html (Accessed: 6 July 2025).

Statistisches Bundesamt (Destatis) (2025) *Industry, Manufacturing – German Federal Statistical Office*. Wiesbaden: Destatis.

Subedi, K.R. (2021) 'Determining the Sample in Qualitative Research', *Scholars' Journal*, 4(1), pp.1-8. Available at: https://www.nepjol.info/index.php/scholars.

Tachie, C., Nwachukwu, I.D. and Aryee, A.N.A. (2023) 'Trends and innovations in the formulation of plant-based foods', *Food Production, Processing and Nutrition,* 5(1), 16. Available at: https://doi.org/10.1186/s43014-023-00129-0.

Tarabella, A. *et al.* (2019) 'Innovation in the Food Industry: A Comparison Between New and Traditional Categories of Foodstuffs', in *New Food Product Development Across Europe*. Cham: Springer pp. 23–39, pp. 23–39. Available at: https://doi.org/10.1007/978-3-319-23811-1_3.

Tashakkori, A. and Teddlie, C. (2010) *SAGE Handbook of Mixed Methods in Social & Behavioral Research*. SAGE Publications.

Teece, D.J. (2010) 'Business models, business strategy and innovation', *Long Range Planning*, 43(2–3), pp. 172–194. Available at: https://doi.org/10.1016/j.lrp.2009.07.003.

Tellis, G.J., Prabhu, J.C. and Chandy, R.K. (2009) 'Radical innovation across nations: the preeminence of corporate culture', *Journal of Marketing*, 73(1), pp. 1-22.

Thompson, L.L. (2004) *Creativity and Innovation in Organizational Teams*. New York: Psychology Press.

Tödtling, F., Lehner, P. and Kaufmann, A. (2009) 'Do different types of innovation rely on specific kinds of knowledge interactions?', *Technovation*, 29(1), pp. 59–71. Available at: https://doi.org/10.1016/J.TECHNOVATION.2008.05.002.

Traill, W.B. and Meulenberg, M.T.G. (2002) 'Innovation in the food industry', *Agribusiness*, 18(1), pp. 1–22. Available at: https://doi.org/10.1002/agr.10002.

Traitler, H. and Saguy, S. (2009) *Creating Successful Innovation Partnerships*. Chicago: Institute of Food Technologies. Available at: www.ift.org.

Traitler, H., Watzke, H.J. and Saguy, I.S. (2011) 'Reinventing R&D in an Open Innovation Ecosystem', *Journal of Food Science*, 76(2), pp. 62–68. Available at: https://doi.org/10.1111/j.1750-3841.2010.01998.x.

Trott, P. and Simms, C. (2017) 'An examination of product innovation in low- and medium-technology industries: Cases from the UK packaged food sector', *Research Policy*, 46(3), pp. 605–623. Available at: https://doi.org/10.1016/J.RESPOL.2017.01.007.

Tushman, M.L. and O'Reilly, C.A. (1997) *Winning through innovation: A practical guide to leading organizational change and renewal*. Boston, MA: Harvard Business School Press.

Ulvenblad, P., Ulvenblad, P. and Tell, J. (2019) 'An overview of sustainable business models for innovation in Swedish agri-food production', *Journal of Integrative Environmental Sciences*, 16(1), pp. 1–22. Available at: https://doi.org/10.1080/1943815X.2018.1554590.

Usman, M. and Xu, M. (2024) 'Plant-Based Proteins: Plant Source, Extraction, Food Applications, and Challenges', in *Flavor-Associated Applications in Health and Wellness Food Products*. Cham: Springer, pp. 253–294. Available at: https://doi.org/10.1007/978-3-031-51808-9_11.

Valkokari, K. and Helander, N. (2007) 'Knowledge management in different types of strategic SME networks', *Management Research News*, pp. 597–608. Available at: https://doi.org/10.1108/01409170710773724.

Valkokari, K., Paasi, J. and Rantala, T. (2012) 'Managing knowledge within networked innovation', *Knowledge Management Research and Practice*, 10(1), pp. 27–40. Available at: https://doi.org/10.1057/kmrp.2011.39.

Valkokari and Katri (in press) 'Networked innovation', in Eriksson, P. et al. (eds.) *Elgar Encyclopedia of Innovation Management*. Cheltenham: Edward Elgar Publishing. Available at: https://doi.org/10.4337/9781035306459.

Vegconomist (2025) *The Latest Technological Innovations in Plant-Based Food Processing.* Available at: https://vegconomist.com/ manufacturing-technology/ latest-technological-innovations-plant-based-food-processing/ (Accessed: 22 April 2025).

Verhees, F.J.H.M. and Meulenberg, M.T.G. (2004) 'Market orientation, innovativeness, product innovation, and performance in small firms', *Journal of Small Business Management*, 42(2), pp. 134–154.

Van de Vrande, V. *et al.* (2009) 'Open innovation in SMEs: Trends, motives and management challenges', *Technovation*, 29(6–7), pp. 423–437. Available at: https://doi.org/10.1016/j.technovation.2008.10.001.

Wallin, M.W. and Von Krogh, G. (2010) 'Organizing for Open Innovation: Focus on the Integration of Knowledge', *Organizational Dynamics*, 39(2), pp. 145–154. Available at: https://doi.org/10.1016/j.orgdyn.2010.01.010.

Wankhede, L. *et al.* (2025) 'Raw material selection for sustainable fermentation-derived alternative protein production: a review', *Systems Microbiology and Biomanufacturing*. Springer Nature, pp. 1–14. Available at: https://doi.org/10.1007/s43393-024-00294-4.

Weindlmaier, H. (2001) 'General aspects of food innovation management', in R. Treillon (ed.) *Food innovation management: From idea to success*. Paris: ENSIA, pp. 3–33.

Welter, F. (2018) 'The Mittelstand: a Specific Entrepreneurial Profile of the Social Market Economy', *Journal for Markets and Ethics*, 6(1), pp. 99–106. Available at: https://doi.org/10.2478/jome-2018-0029.

West, J. and Gallagher, S. (2006) 'Challenges of open innovation: The paradox of firm investment in open-source software', *R and D Management*, 36(3), pp. 319–331. Available at: https://doi.org/10.1111/j.1467-9310.2006.00436.x.

Westhead, P. *et al.* (2005) 'Novice, Serial and Portfolio Entrepreneur Behaviour and Contributions', *Small Business Economics*, 25(2), pp. 109–132. Available at: https://doi.org/10.1007/s11187-003-6461-9.

Wixe, S. *et al.* (2023) 'The role of collaboration and external knowledge for innovation in small food firms', in *Annals of Regional Science*. Springer Science and Business Media Deutschland GmbH, pp. 135–155. Available at: https://doi.org/10.1007/s00168-021-01087-6.

World Commission on Environment and Development (1987) *Our Common Future*. Oxford: Oxford University Press.

Zickafoose, A., Lu, P. and Baker, M. (2022) 'Forecasting food innovations with a Delphi study', *Foods*, 11(22), 3723. Available at: https://doi.org/10.3390/foods11223723.

Zikmund, W.G. *et al.* (2013) *Business Research Methods*. 9th edn. Boston, MA: Cengage Learning.

9 ACKNOWLEDGEMENT OF THE USE OF GEN AI

The researcher of this study acknowledges the use of generative artificial intelligence tools in the editing and revision phase of this thesis. Microsoft Copilot was used for planning the editing, developing ideas for revision and proofreading, in accordance with university guidelines. All deliverables were critically reviewed and edited to ensure originality and academic integrity.

10 APPENDIX

10.1 INTERVIEW GUIDELINE AND QUESTIONS OF THE NARRATIVE INTERVIEWS

Introduction

a. Small talk
b. Appreciation for the participation in the study, recap of study´s purpose and the voluntary nature
   Recording will be switched on as soon as possible after the small talk.
   Recording starts before the declaration of consent to participation and recording.
c. Note on confidentiality/anonymisation of data as well as consent to participation and recording.
d. Loosening up (make the participant comfortable to speak freely, possibility to ask any questions)
e. Notes on procedure of a narrative interview

"I'll just listen at first and ask a few questions later. Just talk about whatever comes to your mind about the topic first."

Opening Question

"I would like you to tell me how you develop new products at xxx and how the process works? What has been your experience with the process? What is particularly important to you?" Please take your time to tell your story in detail.

The phase is considered complete when the participant has nothing more to say, even after a longer pause of several seconds.

Possible immanent questions

"You have often emphasised the initial phase of the innovation process. That seems to be important to you. Can you elaborate on that?"

"You said people involved in the innovation process need to feel responsible. For what exactly do they have to feel responsible?"

"You said it was difficult to open up the process in your company. Can you explain why this is so difficult?"

I would like to go into more detail about the openness of the process. Can you please explain whether openness has an influence on your innovation results?

Possible exmanent questions (collaboration)

"Please tell me about your experience of how you collaborate with external organisations (partners) in the innovation process?"
("Which organisations do you work with?")

Possible prompts:

1. Please tell me about your experience. What is important to you when it comes to **external collaboration in the innovation process**?

2. Could you clarify in which **innovation phases** you particularly rely on external collaboration (with which organisation)?

3. Please tell me about your experience. What are your **reasons** for relying on external collaboration?

4. Framework conditions
5. Opportunities and barriers

   ➔ Could you describe...?
   ➔ Could you clarify...?
   ➔ Could you elaborate on a particular aspect of…?

Possible exmanent questions (Management capabilities)

"Please tell me from your experience what capabilities managers in your company need to collaborate in the innovation process?"

Possible prompts:

1) "Could you tell me from your experience, which management capabilities a manager need in order to be able **to open the innovation process** and **manage external collaboration**?"

2) Could you describe which capabilities (competencies) managers need to **network and to manage the network**?"

3) Could you describe from your experience which role your company´s **vision and mission** play when it comes to external collaboration in the innovation process?

4) Could you elaborate on the **responsibility for future generations/sustainability** in the context of external collaboration in the innovation process?

Closing

„Perhaps you could share any documents that underline your experience with the innovation process or provide more context?"

The researcher announces that she will contact the participants to give them the opportunity to read the narratives and check interpretations. The researcher also offers access to the final study after its completion. Finally, the researcher thanks the participant for his/ her/their participation.

10.2 APPROACHING DIRECT LINKEDIN CONTACTS

Subject: DBA thesis -Sonja Bruning-Mescher- Support for data collection

Dear (first name),

Today I am writing to you on a professional matter of academic research. "The future of food is plant-based" - that is my vision of a future food system. In order to expand the academic knowledge in this field and gain new insights for practice, I decided some time ago to start a Doctor of Business Administration programme at the University of Worcester.

My doctoral study aims to understand how food innovation happens in the plant-based protein food sector, which serves as an important example of innovation promoting the transition of the food system towards sustainability and health.

I am particularly interested in exploring the process of plant-based protein food innovation, to understand how organisations collaborate in this process and which capabilities and mindset manager require to innovate effectively. Therefore, I am looking for participants who are familiar with the innovation process in companies based in Germany with a purely plant-based protein food assortment. Based on your profile, you would meet these criteria.

I would be appreciated if you could share your experiences with me in an interview. The interview will be conducted via MS-Teams and will last around 60 to 90 minutes. The interview situation also offers you the opportunity to reflect on your own innovation process in your company. Your participation is of course voluntary. All participant-related information will be anonymised.

If you are interested in taking part in the study or need any further information, please contact me. As soon as you indicate your interest, I will send you more detailed information about the study.

I would be very pleased if you would support my research with your participation. I am looking forward to hearing from you.

Kind regards,
Sonja

Sonja Bruning-Mescher

E-Mail: brus2_19@uni.worc.ac.uk Phone: xxx

10.3 APPROACHING DIRECT CONTACTS FOR RECOMMENDATION OR INTRODUCTION TO POTENTIAL PARTICIPANTS

Subject: DBA thesis -Sonja Bruning-Mescher- Support for data collection

Dear (first name),

Today I am writing to you on a professional matter of academic research. "The future of food is plant-based" - that is my vision of a future food system. In order to expand the academic knowledge in this field and gain new insights for practice, I decided some time ago to start a Doctor of Business Administration programme at the University of Worcester.

My doctoral study aims to understand how food innovation happens in the plant-based protein food sector, which serves as an important example of innovation promoting the transition of the food system towards sustainability and health.

I am particularly interested in exploring the process of plant-based protein food innovation, to understand how organisations collaborate in this process and which capabilities and mindset manager require to innovate effectively. Therefore, I am looking for participants who are familiar with the innovation process in companies based in Germany with a purely plant-based protein food assortment. Preferably, senior manager in function of innovation project lead or owner out of following job roles, e.g., Research &Development Manager, Innovation Manager, Marketing-, Brand-, or Product Manager or Commercial Manager

The study uses primarily interviews to gain data. Each interview will be conducted via MS-Teams and will last around 60 to 90 minutes. Participation is voluntary. All participant-related information will be anonymised.

I would be very grateful if you could recommend or introduce me to any potential participant out of your network who might meet the selection criteria and be interested in participating in the study. Also let me know if you are interested in discussing my research idea further.

Thank you very much in advance for your support. I look forward to hearing from you.

Kind regards,

Sonja

Sonja Bruning-Mescher

E-Mail: brus2_19@uni.worc.ac.uk Phone: xxx

10.4 APPROACHING CONTACTS INTRODUCED BY LINKEDIN CONTACTS OR INFORMAL BUSINESS CONTACTS

Subject: DBA thesis -Sonja Bruning-Mescher- Support for data collection

Dear (first name),

[name of person who provided the contact] was so kind to provide me with your contact details.

"The future of food is plant-based" - that is my vision of a future food system. In order to expand the academic knowledge in this field and gain new insights for practice, I decided some time ago to start a Doctor of Business Administration programme at the University of Worcester.

My doctoral study aims to understand how food innovation happens in the plant-based protein food sector, which serves as an important example of innovation promoting the transition of food system towards sustainability and health.

I am particularly interested in exploring the process of plant-based protein food innovation, to understand how organisations collaborate in this process and which capabilities and mindset manager require to innovate effectively. Therefore, I am looking for participants who are familiar with the innovation process in companies based in Germany with a purely plant-based protein food assortment.

Based on [name of person who provided the contact] description of your job and your company profile you might meet these criteria. I would be appreciated if you could share your experiences with me in an interview. The interview will be conducted via MS-Teams and will last around 60 to 90 minutes. The interview situation also offers you the opportunity to reflect on your own innovation process in your company. Your participation is voluntary. All participant-related information will be anonymised.

If you are interested in taking part in the study or need any further information, please contact me. As soon as you indicate your interest, I will send you more detailed information about the study.

I would be very pleased if you would support my research with your participation. I am looking forward to hearing from you.

Kind regards,

Sonja

Sonja Bruning-Mescher E-Mail: brus2_19@uni.worc.ac.uk Phone: xxx

10.5 CALL FOR PARTICIPATION VIA LINKEDIN POST

🌱🔍 Call for Participation in My Research Project! 🔍🌱

"The future of food is plant-based" – that is my vision of a future food system. 🍃 I have embarked on a Doctor of Business Administration programme at the University of Worcester to expand academic insights and bridge theory with practice.

My doctoral thesis aims to understand how food innovation takes place in the plant-based protein food sector. This sector is a beacon of innovation and is also one of the levers for the further transformation of the food system towards sustainability and health.

The foundations of my study are laid, and the theoretical basis is set for the crucial phase of data collection.

🚀 I'm particularly keen on exploring the process of plant-based protein food innovation and the role of collaboration in the innovation journey journey. Hence, I'm on the lookout for participants familiar with the innovation processes within DACH region-based companies and exclusively offering plant-based protein food assortments.

🤝 **Interested in participating?** Your insights are invaluable, and I invite you to become a vital part of my study! Share your experiences in an interview, and let's dive into this mutually beneficial exchange! 💡Anonymity will be secured for your comfort and confidentiality. Reflecting on your own innovation process is an additional benefit for you. I will also be happy to provide a summary of the study´s findings.

🌐 **Know Potential Participants?** Your network could be the key! Share this post - recommendations are more than welcome. 💡

💬 **Interested in a Discussion?** I'm open to exchanging ideas and thoughts about my research. Your input is highly appreciated, and I welcome any insightful exchange.

🌱 #PlantBasedProtein #FoodInnovation #InnovationProcess #Sustainability #Research #UniversityOfWorcester #WorcesterBusinessSchool 🌐

10.6 APPROACHING INFORMAL BUSINESS CONTACTS

Subject: DBA thesis -Sonja Bruning-Mescher- Support for data collection

Dear (first name),

we met at the trade fair xy/event xy. Today I am writing to you on a professional matter of academic research. "The future of food is plant-based" - that is my vision of a future food system. I have already told you briefly that I decided some time ago to start a Doctor of Business Administration programme at the University of Worcester, to expand the academic knowledge in this field and gain new insights for practice.

My doctoral study aims to understand how food innovation happens in the plant-based protein food sector, which serves as an important example of innovation promoting the transition of food system towards sustainability and health.

The study primarily uses interviews to gain data. Each interview will be conducted via MS-Teams and will last around 60 to 90 minutes. Participation is voluntary. All participant-related information will be anonymised.

I am particularly interested in exploring the process of plant-based protein food innovation, to understand how organisations collaborate in this process and which capabilities and mindset manager require to innovate effectively. Therefore, I am looking for participants who are familiar with the innovation process in companies based in Germany with a purely plant-based protein food assortment. Preferably, senior managers in the function of innovation project lead or owner with one of the following job titles: Research &Development Manager, Innovation Manager, Marketing-, Brand-, or Product Manager or Commercial Manager.

As your company matches the company criteria, I would be very grateful if you could recommend or introduce me to any potential participant in your company who could be appropriate and be interested in participating in the study. Please do let me know if you are interested in discussing my research idea further.

Thank you very much in advance for your support. I look forward to hearing from you.

Kind regards,

Sonja

Sonja Bruning-Mescher E-Mail: brus2_19@uni.worc.ac.uk Phone: xxx

10.7 APPROACHING FOOD INNOVATION NETWORKS AND ASSOCIATIONS

Subject: DBA thesis -Sonja Bruning-Mescher- Support for data collection

Dear (first name),

Today I am writing to you on a professional matter of academic research. "The future of food is plant-based" - that is my vision of a future food system. I decided some time ago to start a Doctor of Business Administration programme at the University of Worcester in order to expand the academic knowledge in this field and gain new insights for practice.

My doctoral study aims to understand how food innovation happens in the plant-based protein food sector, which serves as an important example of innovation promoting the transition of food system towards sustainability and health.

The study primarily uses interviews to gain data. Each interview will be conducted via MS-Teams and will last around 60 to 90 minutes. Participation is voluntary. All participant-related information will be anonymised.

I am particularly interested in exploring the process of plant-based protein food innovation, to understand how organisations collaborate in this process and which capabilities and mindset manager require to innovate effectively. Therefore, I am looking for participants who are familiar with the innovation process in companies based in Germany with a purely plant-based protein food assortment. Preferably, senior managers in the function of innovation project lead or owner with one of the following job titles: Research &Development Manager, Innovation Manager, Marketing-, Brand-, or Product Manager or Commercial Manager.

I would be very grateful if you could distribute the research information in your network or recommend any potential participant. You find some more information about the study, as well as a draft text to distribute my request in appendix. Pleased do let me know if you are interested in discussing my research idea further.

Thank you very much in advance for your support. I look forward to hearing from you.

Kind regards,

Sonja

Sonja Bruning-Mescher E-Mail: brus2_19@uni.worc.ac.uk Phone: xxx

10.8 DRAFT TEXT PROVIDED FOR CONTACT BROKER

Subject: Call for data collection- doctoral study

Dear (network members),

I have received a request from a DBA student of the University of Worcester.

The doctoral study aims to understand how food innovation happens in the plant-based protein food sector. The researcher is particularly interested in exploring the process of plant-based protein food innovation, to understand how organisations collaborate in this process and which capabilities and mindset manager require to innovate effectively.

The researcher is looking for participants who are familiar with the innovation process in companies based in Germany with a purely plant-based protein food assortment. Preferably, senior managers in the function of innovation project lead or owner with one of the following job titles: Research &Development Manager, Innovation Manager, Marketing-, Brand-, or Product Manager or Commercial Manager.

Participation is, of course, voluntary. Each interview will be conducted via MS-Teams, or face-to-face in person, if the participant wishes and will last around 60 to 90 minutes. All participant-related information will be anonymised.

If you are interested to participating or could recommend a potential participant, please contact the researcher directly for further details and procedures:

Sonja Bruning-Mescher
DBA student
E-Mail: brus2_19@uni.worc.ac.uk
Phone: xxx

Thank you very much.

Kind regards,

10.9 INFORMED CONSENT FORM

INFORMED CONSENT FORM

Title of Project **"The future of food is plant-based"**
Exploration of the process of plant-based protein food innovation

Participant identification number for this study: 37
Name of Researcher Sonja Bruning-Mescher

I, the undersigned, confirm that (**please initial boxes as appropriate**):

1.	I have read and understood the information about the project, as provided in the Information Sheet dated 02.11.2023 or it has been read to me.	
2.	I have been able to ask questions about the project and my participation and my questions have been answered to my satisfaction.	
3.	I understand that taking part in this study involves participation in interviews. The interviews are audio recorded, and the researcher takes written notes. I am aware that the audio recording of my interview will be transcribed and analysed as text. The audio recording will be deleted after the analyses. I have been informed that the written notes taken during the interview will be shredded and the transcripts deleted after the study is completed.	
4.	I understand I can withdraw up to 7 days after receiving the transcripts of the interviews for review without giving reasons and that I will not be penalised for withdrawing nor will I be questioned on why I have withdrawn.	
5.	I understand that the information I provide will be primary used in summarized form for the purpose of dissemination through research reports, a thesis, conference papers, journal articles or other publications,	
6.	I agree that my information can be quoted in research outputs.	
7.	I understand that my real name will not be revealed, and pseudonyms will be used for quotes.	
8.	The procedures regarding confidentiality have been clearly explained (e.g., use of names, pseudonyms, anonymisation of data, etc.) to me.	
9	I understand that personal information collected about me that can identify me, such as my name, or where I live, will not be shared beyond the study team.	
10.	I consent to the audio/video recording.	
11.	I understand that other researchers will have access to this data only if they agree to preserve the confidentiality of the data and if they agree to the terms I have specified in this form.	
12.	I voluntarily agree to participate in the project.	
13.	I know who to contact if I have any concerns about this research	

Name of Participant	Signature	Date
Name of Researcher	Signature	Date

10.10 PARTICIPANT INFORMATION SHEET AND PRIVACY NOTICE

Version: 2
Date: 02.11.2023

PARTICIPANT INFORMATION SHEET AND PRIVACY NOTICE

TITLE OF PROJECT:

"The future of food is plant-based"
Exploration of the process of plant-based protein food innovation

Invitation

The University of Worcester engages in a wide range of research which seeks to provide greater understanding of the world around us, to contribute to improved human health and well-being and to provide answers to social, economic and environmental problems.

We would like to invite you to take part in one of our research projects. Before you decide whether to take part, it is important that you understand why the research is being done, what it will involve for you, what information we will ask from you, and what we will do with that information.

We will in the course of this project be collecting personal information. The UK continues to be bound by the provisions of the General Data Protection Regulation which is now the "UK GDPR". Under UK GDPR we are required to provide a justification (what is called a "legal basis") in order to collect such information. The legal basis for this project is "**task carried out in the public interest**".

You can find out more about our approach to dealing with your personal information at https://www.worcester.ac.uk/informationassurance/visitor-privacy-notice.html.

Please take time to read this document carefully.

What is the purpose of the research?

This study aims to explore the process of plant-based protein food innovation. Innovation is one of the key drivers to promote the transition of the food system towards sustainability and health. The plant-based protein food innovation serves as an important example of innovation promoting this transition.

The European Union identified collaboration as one of the key measures for further innovation of sustainability in the food sector. This study purposes to understand and gain insights how organisation collaborate in the plant-based protein food innovation process.

This study also aims to gain a deeper understanding of the role that management skills and mindsets play to effectively develop food innovation as well as in opening up innovation processes.

Who is undertaking the research?

Name: Sonja Bruning-Mescher
Position/Role on the project: Researcher in the "Doctorate of Business Administration" program

Who has oversight of the research?

The research has been approved by the Education Culture and Society Research Ethics Panel in line with the University's Research Ethics Policy. The University of Worcester acts as the "Data Controller" for personal data collected through its research projects and is subject to the UK GDPR and the Data Protection Act 2018. We are registered with the Information Commissioner's Office, and our Data Protection Officer is Helen Johnstone (infoassurance@worc.ac.uk).

For more on our approach to Information Assurance and Security visit: https://www.worcester.ac.uk/informationassurance/index.html.

Why have I been invited to take part?

You have received this invitation because you are familiar with, respectively responsible, for the innovation process in your company. Your company markets a pure plant-based protein food assortment and is one of the pioneering companies in this market segment. Furthermore, the geographical scope for this study has been set on German based companies, as Germany represents one of the largest European markets for these kinds of products and in order to create a regional limitation.

How do I take part?

It is up to you to decide whether or not you want to take part in this study. Please take your time to decide and talk to others about it if you wish. Deciding to take part or not will not impact my study and is completely voluntarily.

The process by which you can agree to participate is by e-mailing the researcher. The researcher will send out a reminder e-mail after 7 days.

If you do decide to take part participate, you will be asked to sign a consent form at the data collection stage.

How can I withdraw from this study after agreeing to participate?

Once you have agreed to participate you can withdraw from the study anytime during the data collection phase (the interview(s)) and up to 7 days after receiving

the transcripts of the interviews for review without explaining your reason(s) and without any consequences.
If you wish to have your data withdrawn, please contact us (our contact details are given below).

What will happen if I agree to take part?

If you agree to take part, the consent form must be signed by you and e-mailed to brus2_19@uni.worc.ac.uk. Please note that the exchange of data and information will only take place between you as participant and the researcher directly to ensure data privacy and anonymity.

As you are volunteering for participation, it is important that you feel comfortable during the whole study. Please feel free to ask any question, regarding the interview processing, data confidentiality, data processing or storage, via email or phone (see contact details below) at any time.

You could meet the researcher virtually for a live Q&A session, to clarify any questions or address any worries with the study and participation before you sign off the consent form. If you are interested, please send an e-mail to, or call the researcher so that an appointment for the Q&A session can be arranged.

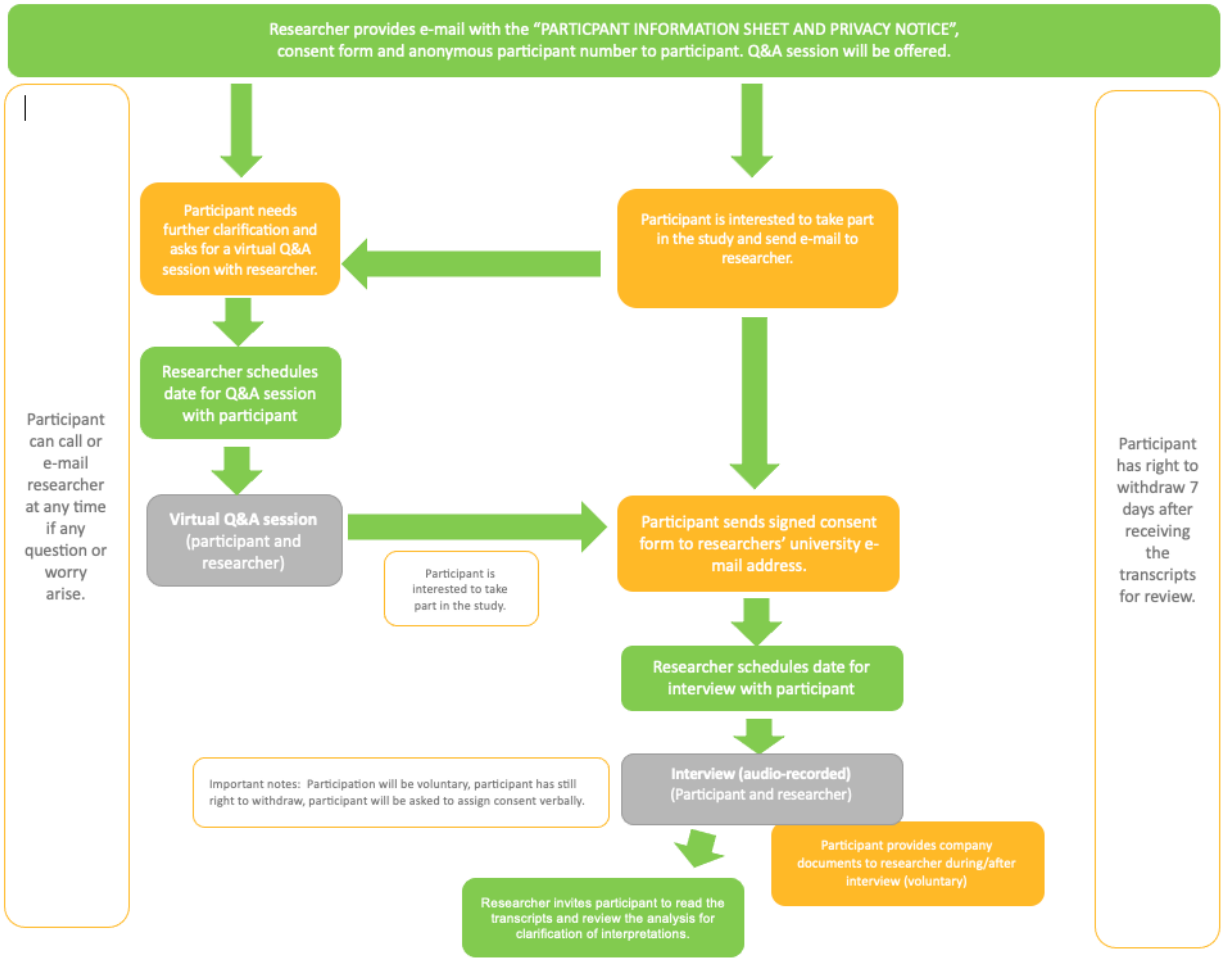
After receiving the signed documents, the researcher will contact you to arrange an appointment for the interview. The date and time for the interview will depend on your availability and should preferably be conducted into 4 weeks after you agreed to participate. The interview is scheduled for 60 to 90 minutes and should ideally by conducted without deadline pressure.

The interviews will be conducted as narrative interviews which enables an in-depth exploration of the process of innovation. This may be a little unusual for you, as the researcher will not ask questions immediately. Instead, you can start by talking freely about your experiences of the innovation process in your company. The interview will follow the following steps:

1. Introduction (welcome, recap of study´s purpose and voluntary nature, confidentiality and anonymization, check consent and recording, clarify procedure)
2. Narration phase (you can tell your story)
3. Question phase
4. Closing

The interview will be held as a video conference preferably by Microsoft Teams. Participants of the meeting are you and just the researcher. To enable the analysis of the data, the complete interview will be recorded. The recording will not be shared and will only be used to create anonymized transcripts. You are invited to read the transcripts and review the analysis for clarification of interpretations.

You can follow up all steps of participation in the following flow chart:



What are the benefits for me in taking part?

The insights gained from this study will contribute to the knowledge field of food innovation and overall promote the transition of the food system towards sustainability and health. By taking part in the interview, you are making an important contribution to this.

Furthermore, accelerating measures such as collaboration can be better understood and advice for practice can be derived.

So far, there is little theoretical knowledge about what managerial skills and mindset are required to effectively support innovation in the food sector overall. The insights gained from your and the other interviews conducted, will help to close this knowledge gap. Furthermore, a framework will be built for advisement in praxis from which you in turn can benefit.

The interview situation also offers you the opportunity to reflect on your own innovation process in your company. Furthermore, an exchange between theory and praxis delivers you new "food for thought" and will be always fruitful for your own development.

Are there any risks for me if I take part?

The research does not pose any immediate potential risks. The researcher is aware that your experience of your company-individual innovation process, as well as the topics of collaboration and innovation capabilities could be sensitive issues for you in terms of competitive advantage. You can be sure that confidentiality of information and anonymity of personal data are guaranteed in all cases.

To avoid any discomfort and to mitigate the risk of COVID-19 transmission, the interviews will be conducted using a video conferencing tool as default.

What will you do with my information?

Your personal data / information will be always treated confidentially; that is, it will not be shared with anyone other than the research project supervisor. It will also not be shared with any third parties specified in the consent form unless it has been fully anonymised. The exception to this is where you tell us something that indicates that you or someone else is at risk of harm.

During the project, all data / information will be kept securely in line with the University's Policy for the Effective Management of Research Data and its Information Security Policy.

We will process your personal information for a range of purposes associated with the project primary of which are:

- To use your information along with information gathered from other participants in the research project to seek new knowledge and understanding that can be derived from the information we have gathered.
- To summarise this information in written form for the purposes of dissemination (through research reports, a thesis, conference papers, journal articles or other publications). Any information disseminated / published will be at a summary level and will be fully anonymised and there will be no way of identifying your individual personal information within the published results.
- To use the summary and conclusions arising from the research project for teaching and further research purposes. Any information used in this way will be at a summary level and will be fully anonymised. There will be no way of identifying your individual personal information from the summary information used in this way.

If you wish to receive a summary of the research findings or to be given access to any of the publications arising from the research, please contact us.

How long will you keep my data for?

Your personal data will be retained until the project (including the dissemination period) has been completed.

At the completion of the project, we will retain your data only in anonymised form. This anonymised data will be archived and shared in line with our Policy for the Effective Management of Research Data.

How can I find out what information you hold about me?

You have certain rights in respect of the personal information the University holds about you. For more information about Individual Rights under GDPR and how you exercise them please visit: https://www.worcester.ac.uk/informationassurance/requests-for-personal-data.html.

What happens next?

Please keep this information sheet.

If you would be interested in taking part, please contact us using the details below and we will be delighted to answer any further questions you have about the research.

Our contact details are:

Sonja Bruning-Mescher,

DBA-student

Phone: xxx

E-mail: brus2_19@uni.worc.ac.uk

Thank you for taking the time to read this information.

If you would like to speak to an independent person who is not a member of the research team, please contact the University of Worcester, using the following details:

Michelle Jellis
Secretary to Education, Culture and Society Research Ethics Panel
University of Worcester
Henwick Grove
Worcester WR2 6AJ
ethics@worc.ac.uk