



SCHOOL OF
ECONOMICS AND
MANAGEMENT

The Changing Face of Dairy

Factors Influencing Innovation Strategies in Mature Markets
A Case Study of the Dairy Industry

By

Alissa Baethke

Eva Börnicke

May 2021

Master's Programme in International Strategic Management
BUSN09 – Degree Project

Abstract

When an industry has reached maturity, firms operating within the industry can face major changes affecting their operations, on occasion even a holistic change of the entire industry structure. Considering such changes, innovation is identified as a powerful tool to take these changes as chances to stay competitive. As a mature industry in the fast-moving-consumer-goods (FMCG) category, the dairy industry is lately faced with emerging trends originated in shifts in consumer preferences on various levels, such as environmental sustainability, health, and animal welfare. These trends and consumer needs have become accelerators for the increasing growth of plant-based dairy alternatives (PBDA); a call to action for dairy companies due to the increasing loss of their market share to PBDA. Considering the role of innovative activity in business strategy, the purpose of this study is to identify and understand the factors that influence innovation strategies of firms operating in mature industries. Employing a single case study design on the dairy industry, seventeen factors relevant for innovation strategy formulation were identified, obtained from literature and ten qualitative interviews. Based on the analysis, an empirical framework presenting the identified influencing factors is provided as a tool for decision makers in mature industries. The study further contributes three key findings: firstly, consumer-centric innovation strategies seem to prove successful in the FMCG environment of the dairy industry. Secondly, the type of a firm's ownership structure seems to be critical for innovation success: while cooperative organizations seem to be challenged by innovation, corporate organizations, in contrast, seem to benefit from their ownership structure. As an ownership structure cannot be changed short-term, leadership and organizational culture change can offer a starting point to adjust innovation strategy and increase cooperatives' agility. Lastly, findings allowed for the assumption that the dairy industry is undergoing a fundamental change in its structure due to the increasing presence of PBDA, which ultimately might lead to the transformation of one of the oldest industries in the food sector.

Keywords: Innovation Strategy, Mature Markets, Industry Structure Change, Dairy Industry

Acknowledgements

First, we would like to express our sincere gratitude to our supervisor, Matts Kärreman, for his efforts, time, and indispensable advice, which have been seminal to the success of this work.

Moreover, we express our appreciation to all the corporate participants for the valuable insights during the study, without which the study would not have been possible as it is. Further appreciation is given to our proof-readers whose efforts made it possible for us to provide the final editing touches to the thesis.

We would like to thank our fellow students and families who accompanied and supported us on the way to this and through the thesis.

Finally, we would also like to thank Arla and Tetra Pak for providing the interesting cases.

Table of Contents

1.	Introduction.....	1
1.1	Revisiting Established Theory	1
1.2	Aim and Objectives	3
1.3	Thesis Outline	4
2.	Literature Review.....	5
2.1	Innovation and Strategy	5
2.1.1	Embedding Innovation Strategy in the Context of Business Strategy	6
2.1.2	Value Creation Through Innovation	7
2.2	Factors Influencing Innovation Strategies.....	8
2.2.1	Industry-Level Factors Influencing Innovation Strategies	8
2.2.2	Firm-Level Factors Influencing Innovation Strategies	13
2.3	Summary & Preliminary Framework.....	21
3.	Methodology.....	23
3.1	Research Approach & Research Design	23
3.2	Case Selection & Data Sources	25
3.3	Data Collection.....	28
3.4	Data Analysis	29
3.5	Validity, Reliability & Ethical Considerations	31
3.6	Limitations	32
4.	Findings and Analysis.....	34
4.1	Analysis of the Case Industry.....	34
4.1.1	The Dairy Industry Defined	34
4.1.2	Existing Competition in the Dairy Industry.....	35
4.1.3	The Power of Customers and Consumers	36
4.1.4	Pressure Through Substitute Products	37
4.1.5	The Threat of New Entry	40

4.2	Factors Influencing Innovation Strategies.....	41
4.2.1	Industry-Level Factors Influencing Innovation Strategies	41
4.2.2	Firm-Level Factors Influencing Innovation Strategies	47
4.3	Additional Factors Influencing Innovation Strategy	60
4.4	Revised Framework.....	63
5.	Discussion and Conclusion	66
5.1	Main Findings	66
5.2	Practical Implications	68
5.3	Limitations and Implications for Further Research.....	71
	References.....	73
	Appendix A.....	84
	Appendix B	85
	Appendix C.....	88

List of Abbreviations

CAGR	Compound Annual Growth Rate
Co Op	Cooperative
FMCG	Fast Moving Consumer Goods
M&A	Mergers & Acquisitions
PBDA	Plant-based Dairy Alternatives
RBV	Resource-based View
VRIO	Valuable, Rare, Inimitable, Organized

List of Tables

Table 1 - Overview of Participants26

List of Figures

Figure 1 – Analytical Framework (Business and Innovation Strategy) (Onufrey & Bergek, 2020).....6

Figure 2 - Industry Life Cycle (Frost, 1983)8

Figure 3 - Preliminary Framework on Factors Influencing Innovation Strategy22

Figure 4 - Marketing Channels of Milk in Farms (Artukoglu & Olgun, 2008).....36

Figure 5 - Environmental Footprint of Milk and PBDAs (Brown, 2019).....39

Figure 6 - Empirical Framework on Factors Influencing Innovation Strategy.....65

1. Introduction

Innovation seems to be on everyone's agenda in the business world. It is seen as a powerful tool for companies to dominate competitors, change industry conditions, decrease costs and increase productivity, while its ultimate goal is to increase and create value (Greenhalgh & Rogers, 2010). In the early ninety's, Christensen (1992) introduced the technology s-curve as a framework to contextualize the substitution of old technologies by the introduction of newer technologies. Innovation is put at the centre of attention in his research, claiming that innovation builds the foundation for companies' long-term success. Henderson & Clark (1990) support this attention to innovation and explicitly introduce the concept of a dominant design, where a particular innovation becomes industry standard and therefore brings significant competitive advantage to the introducing firm. In the recent years, globalization and the associated economic developments towards an increasingly interconnected world have contributed to an intensified frequency of change, resulting in a highly dynamic economic landscape. As one of the aspects in the centre of these developments, changing consumer demands and the frequent emergence of new trends and lifestyles represent major triggers for innovation and therefore both challenge and opportunity for organizations (Baregheh, Rowley & Sambrook, 2009). These consumer demands and trends are complemented by political initiatives on a global level, such as the Sustainable Development Goals that encourage sustainable consumptions, human and planetary health (United Nations, n.d.a), and the Paris Climate Agreement, a global treaty on climate change, signed by 196 countries across the globe that aim to limit global warming (United Nations, n.d.b). Not only are organizations influenced by these changes; they can themselves become the origin that triggers change by taking actions such as the establishment of new standards or disruptive technologies that force competitive participants to follow. Conclusively, innovation can be seen as a substantial, if not fundamental tool for organizations' success and performance.

1.1 Revisiting Established Theory

An interesting observation widely discussed in literature is that innovation types and techniques vary based on the specific stage in an industry's life cycle (Frost, 1983; Tavassoli, 2015). Particularly in the mature stage of an industry, many argue that incumbents generally have an advantage over smaller firms due to their depth and long-term acquired knowledge (Bergek,

Berggren, Magnusson & Hobday, 2013; Hopenhayn, 1992; Porter, 1989). Incumbents, as opposed to new entrants, can be described as established firms which have been operating in an industry for a long period of time and often hold a significant share of the respective market. Rosenbloom and Christensen (1994) take on a more differentiated view on this matter; their study revealed that incumbents' advantage over new entrants to a mature industry is given only in case these incumbents possess the relevant resources to innovate and no change in the firm's strategic direction is required. Their line of argumentation implies that an innovation can be disrupting even if simple, provided that the incumbent needs to establish novel resources to be able to compete. In relation to the argument of the incumbents' advantage over new entrants, Porter's (1989) renowned paper 'The five competitive forces that shape strategy' entails that new entrants to mature markets do display a threat to incumbents, which is also widely supported by literature (Barney, 1991; Hopenhayn, 1992; Rosenbloom & Christensen, 1994) .

But are these claims universal for mature industries? Have they changed since their initial contribution? In recent years, various market developments have shown that smaller firms can in fact become critical competitors in mature industries, evident in many examples: newly entered, specialized automobile producers such as Tesla have disrupted the automotive industry which has reached maturity since years but is challenged and pressured to change ever since Tesla's entry. While global mature industries commonly require the ability of companies to offer products with high scalability potential, innovative activities have increasingly moved to the centre of attention in such industries, alongside consumer centricity (Blake, Cucuzza & Rishi, 2003). Especially incumbents are forced to re-assess their operations and invest in innovative activities to remain competitive. Another topical example is Oatly, the once fameless oat milk producing company that is remarkably influencing the activities of incumbent dairy companies as it shapes the emerging trend for plant-based dairy alternative products (PBDA), addressing environmental sustainability and planetary health as the core of their purpose (Koch, 2020). These examples display exceptions to the arguments introduced earlier, challenging long-taught theory on innovation strategies, business activities and their consequences.

Gaining significant traction, there seems to be a shift of organizations' strategic foci, moving consumers and emerging trends to the centre of attention more than ever before, resulting in

many organizations taking on a consumer-centric approach shaped by faster innovation and time-to-market, and a strong focus on consumer needs (Blake, Cucuzza & Rishi, 2003).

1.2 Aim and Objectives

Intrigued by this phenomenon of divergence between the long-established and common theories on business strategy and innovation, and the recent developments and arguments, the purpose of this study is to determine and understand the elements impacting innovation strategies of companies in mature industries. It addresses a range of factors that previous research found to be important to innovation strategy formulation and relates those to the nature of mature industries. The aim of the developed framework is to provide a tool that ideally displays an aid for successful decision making in the context of innovation strategies for firms in relation to the PBDA market developments and developments in other mature markets. To tailor existing research's theoretical concepts related to innovation strategy formulation to the context of a mature industry, the dairy industry was chosen as a case for this study. The underlying research question is therefore:

*What factors influence and shape the innovation strategy development
in firms operating in mature industries?*

As mentioned, the dairy industry was chosen as the case for this study as it displays a suitable, highly current research subject for various reasons that are elaborated further in Chapter 4.1. Two placative reasons, however, are the rapidly accelerating growth of PBDA products introduced by new entrants, as well as the fact that the PBDA market is not a parallel market to the dairy market, but instead is slowly taking on market share of dairy companies, turning it into a pressing topic for incumbent dairy processors (Matthieu, Dairy Expert 1). Bearing a particularly interesting set of rather recent developments, no significant stream of research investigating innovation strategies in the dairy industry and the elements influencing them could be found in existing literature. The study therefore addresses the implications for dairy producing or processing firms' innovation potentials from a strategic management perspective, aiming to fill the identified research gap. Putting the theoretical considerations into a real-life perspective, an in-depth analysis of the latest developments in the dairy industry and the PBDA market developments is provided in Chapter 4.1.

The study aims to show the elements that influence firms' innovation strategies in mature markets by means of the dairy industry which is confronted with increasing competition by PBDA products that are gaining significant market share. For the purpose of this study, innovation is considered from a strategic rather than from an operational perspective, which is why regularly targeted aims of innovation projects, such as the reduction of cost and the increase of profitability, are not the focal point of this thesis. As these are common goals of a firm's operations and respectively also drivers of innovation, as, amongst others, insinuated by Drake, Haka and Ravenscroft (1999), Franke (2007), Love, Roper and Du (2009) and Roos (2014), these elements are not considered as representing a gap in academic research. Therefore, they are only touched upon peripherally, while the main purpose lies on shedding light on factors influencing innovation strategy development from a more strategic perspective.

1.3 Thesis Outline

The thesis is divided into five chapters. The first chapter after the introduction, Chapter 2, consists of a literature review that addresses the elements influencing innovation strategies of companies in mature markets, building a foundation for the subsequently constructed theoretical framework which is presented at the end of the chapter. Chapter 3 describes the methodological choices, research approach and design used to conduct this study. Chapter 4 begins with an analysis of the dairy industry as the case industry, putting the study into perspective and relating it to the theoretical context presented in the literature review. This analysis aims to provide the reader with an adequate background on the case industry by offering a deeper look into the changes within the dairy industry, various factors that trigger these changes, and the PBDA market developments. Chapter 4 continues with the findings and analysis of the data collected in the interviews, connecting primary data with the theories presented in the literature review. Chapter 5 as the final chapter offers a discussion of the presented findings and analysis and concludes with both practical implications and suggestions for further research.

2. Literature Review

This literature review is concerned with aspects that help to gain an understanding of the various elements that build the foundation for an informed execution of primary research (Creswell & Creswell, 2018a). The review of existing literature contributed to the detection of the research gap that this study addresses, and subsequently to its purpose. The initial definition of the research objective was followed by a screening of academic literature (Saunders, Lewis & Thornhill, 2016a) to identify relevant concepts and theories related to the research topic. The literature review was conducted iteratively; search terms were continuously refined and updated in response to the researchers' increased familiarity with the subject matter with time. Overall, the concepts and topics presented are intended to contribute to answering the research question and develop or expand theory, thus the contents were carefully chosen based on their relevance and potential to deliver appropriate answers. The literature review was organized based on the influence of innovation on two levels: the (internal) firm level and the industry level. This categorization was based on a similar pattern detected in research during the literature review process and allowed for a structured and clustered elaboration of the related research streams.

The foundation for the literature review is based on Melissa Schilling's (2017e) book 'Strategic Management of Technological Innovation' and extended with additional factors that were deemed important in related literature. While Schilling (2017e) provides a detailed overview of factors influencing innovation strategies in general, some more specific factors are not covered in the scope of her book. To provide a holistic theoretical overview, the literature review commences with rather general factors such as the concept of innovation in the context of strategy and the primary goal of innovation. These factors were considered relevant to provide the reader with a sufficient and informing background. Additional factors were chosen based on the richness of discussions in existing literature that claim such factors as influential in the context of innovation strategies.

2.1 Innovation and Strategy

Innovation is described as the practice of creating significant new value for both the firm and its customers by changing one or several dimensions of the current business, while the focus

lies on the generated value, rather than new products or services as such (Sawhney, Wolcott & Arroniz, 2007). As opposed to an invention, which represents the discovery of new knowledge and ideas, an innovation represents the actual knowledge implementation, turning it into a value creating product or service that is part of the economic system (Greenhalgh & Rogers, 2010). There are various sources innovation can emerge from. According to Drucker (1998), innovation can be prompted by unexpected occurrences, incongruities, process needs, industry and market changes, demographic changes, changes in perception and new knowledge. The following section embeds innovation into the broader context of business strategy. The sources and types of innovation and its relationship to business strategy is outlined based on several aspects, considering the existing dynamics between innovation and strategic considerations.

2.1.1 Embedding Innovation Strategy in the Context of Business Strategy

In the business context, an innovation strategy can broadly be described as “a set of decisions with regard to the development and renewal of a firm’s offer, i.e. what innovations to pursue, why and how”, mainly related to how a company allocates its resources (Onufrey & Bergek, 2020, p.3). Onufrey & Bergek (2020) present an analytical framework (Figure 1) that demonstrates the relationship between business strategy and innovation strategy, particularly addressing the dynamics of firm resources and the firm’s competitive environment, and how particular decisions in each of these fields lead to different strategic outcomes. The authors further describe two different positional facets of innovation strategies: the competitive position and the resource position. The former implies the different perspectives of product innovation, process innovation and technology leadership. The latter is concerned with the firm’s internal resources and implies two contrary perspectives: exploitation, where existing resources are used to expand existing knowledge in existing market structures, and exploration, where the goal is discovery and development of new products in new markets (Onufrey & Bergek, 2020).

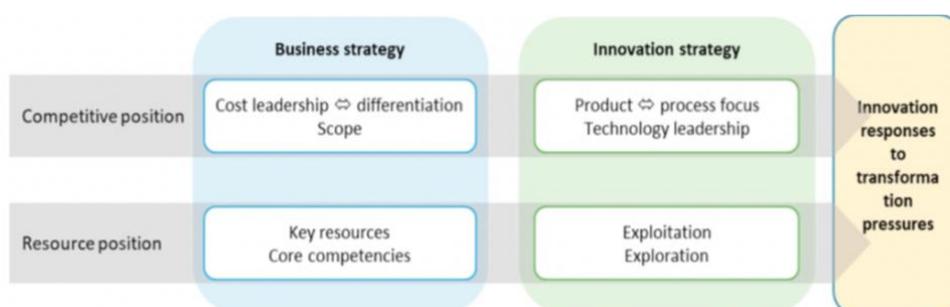


Figure 1: Analytical Framework (Business and Innovation Strategy) (Onufrey & Bergek, 2020)

López (2005) explicitly supports the argument that the practice of exploration needs to be prioritized by firms to ensure their ability to compete; therefore, it should play an important role in strategy formulation, which ultimately aims for 'future viability'. Pisano (2015) additionally emphasizes the importance of creating a fit between innovation and a firm's business strategy for, among other factors, accurate resource allocation.

The influence innovation on firm performance differs among industries. For example, research has shown that the practice of innovation, especially in fast-moving consumer goods (FMCG) industries, is directly related to the likelihood of firms' survival (Audretsch, 1995). Firms that enter such industries and successfully survive the first years post entry can achieve significantly higher growth rates than in less innovative industries. Generally, a lack of innovation can lead to economic failure in industries with increasing knowledge-intensity (Hartwich & Negro, 2010). Furthermore, the growing industrialization of the agricultural sector and the resulting environmental consequences require and lead to a general need for structural changes; a factor that may ultimately influence company performance as well.

2.1.2 Value Creation Through Innovation

According to Pisano (2015), the formulation of an innovation strategy requires the company to articulate a clear vision on how to achieve sustainable competitive advantage by creating value through innovation. Taking the value creation aspect into consideration helps the company to determine the type of innovation that is likely to be successful and subsequently allocate its resources based on these predictions. In light of value creation through innovative activities, Hockerts & Wüstenhagen (2010) outline interesting complementary facets of incumbents and new entrants. They explain that new entrants can stimulate market participants and consumers through the introduction of innovations that trigger changes in consumption patterns, which in turn signals to incumbents the viability of such innovations for their own concerns. Diekhof & Cantner (2017) support this argument as they claim that incumbents can be stimulated by new entrants to transition into directions differing from the original, thereby creating a greater value through innovation by focusing on factors such as environmental sustainability.

After having contextualized innovation with business strategy, the following chapter presents the factors that are assumed to be affecting the development of innovation strategies as they can trigger firms to react to any kind of market disruption or industry change.

2.2 Factors Influencing Innovation Strategies

The nature of the factors influencing innovation strategies identified in literature allows for a categorization of these elements into two different levels of influence: the industry level and the firm level. In the following section, these factors are presented within their respective category.

2.2.1 Industry-Level Factors Influencing Innovation Strategies

The following factors influencing innovation strategy based on literature were deemed to belong to the industry level based on their nature of influence.

2.2.1.1 Industry Lifecycle Stage

Industries commonly undergo several development stages over time: an initial technological breakthrough, the early market development, market segmentation, early maturity, stable maturity, and unstable overcapacity, usually followed by a particular type of restructuring regarding location, technology, or a certain form of integration. This process is described as the ‘industry lifecycle’ (Frost, 1983), visualized in Figure 2. Industries shaped by relatively little new applications of products, little product differentiation, a general emphasis on innovations that improve productivity and reduce cost, an increased number of substitutes offered by competitors, relatively slow growth, a focus on price competition, and overcapacity throughout the business cycle are described as mature industries (Frost, 1983).

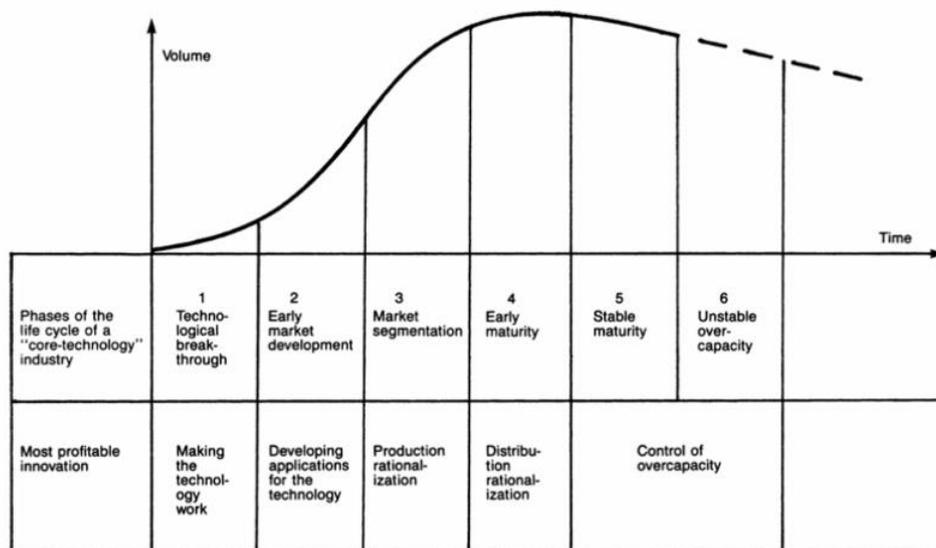


Figure 2: Industry Life Cycle (Frost, 1983)

Firms' innovation strategies usually change with the respective stage within the industry life cycle: research revealed that firms mostly employ product-focused innovation within the growth stage, and process-focused innovation within the maturity phase of the industry life cycle (Cucculelli & Peruzzi, 2020). As it concerns firms' continued operations in mature industries, Frost (1983) argues that either product diversification or ongoing emphasis on innovation can be successful strategies to be employed during maturity. Gilbert and Strebel (1987) explain that industries can undergo transitions of an evolutionary kind as they develop throughout their lifecycle. The authors emphasize that a firm's competitive advantage can only then be sustained during a transition if a thorough understanding of the transition is assured.

Particularly related to mature industries, research shows discrepant theories regarding new entrants and incumbent firms. Porter (2008) claims that new entrants to an industry display a threat to incumbents. Conversely, Bergek, Berggren, Magnusson and Hobday (2013) provide evidence for the fact that firms can hold significant advantage over new entrants to the market through general depth and breadth of long-term-acquired knowledge in the respective industries. This phenomenon is related to the concept of 'creative accumulation' which was first introduced by Pavitt (1986) and describes the practice of innovation by incumbent companies based on their accumulated knowledge and established capabilities. Subsequently, potential entrants face significant barriers to market entry due to the complex practice of combining new and existing technology and knowledge. Simultaneously, incumbents do face challenges lying in the creative aspect of new knowledge and therefore cannot solely rely on their established capabilities and assets (Bergek et al., 2013) when forming innovation strategies. Bergek et al. (2013) therefore recommend firms that need to engage in both exploitation and exploration in their innovation strategies to diversify their way of innovation activity.

2.2.1.2 Competitive Environment

In the process of innovation, the assessment of a company's competitive environment helps the firm to develop a successful innovation strategy (Schilling, 2017a). As one of the most cited frameworks in management, 'Porter's Five Forces' entail the threat of new entrants, bargaining power of buyers and suppliers, the threat of substitutes, and rivalry among existing competitors (Porter, 2008). An assessment of these elements provides the foundation to understand the origins of the firm's profitability and interpret competitors' successes and failures as well as

influencing factors of such. The Five Forces vary in their intensity based on the industry a company operates in. Importantly, a company not only needs to assess the Five Forces, but more so understand the underlying drivers for them to successfully establish strategies.

Besides these factors, Porter (2008) stresses the importance of industry structure as the industry's determinant of long-term profit potential. It is therefore important to consider industry structure when assessing the competitive environment, particularly industry growth rate, the industry's degree of technology and innovation, governmental regulations and general influence, and the availability and importance of complementary products and services (Schilling, 2017a). If the structure of an industry changes, all Five Forces can be shifted in various directions. If a company manages to shape industry structure by leading it in a beneficial direction, it can simultaneously shape the impact of the Five Forces within it. The adequate definition of the respective industry is hereby of utmost importance to make successful strategic decisions (Porter, 2008). Gilbert and Strebel (1987) claim that particularly in mature industries, products are seen as a commodity, which often leads to price competition among competitors and cost reduction as focal strategies. Alongside with this, incumbents might be threatened by "sudden product or process obsolescence" (Gilbert & Strebel, 1987, p.5). Furthermore, competition represents a critical driver of market disruption, as it often is the source of innovative activities, supporting the relevance of the competitive environment in innovation strategy formulation (Hill & Rothaermel, 2003).

2.2.1.3 Consumers & Trends

Consumers can have mentionable impact on a firm's innovation strategy. For many years, researchers described innovation as being originated in the firm (Hauser, Tellis & Griffin, 2006). More recent research has though exposed that consumers, or users, increasingly contribute to innovation; not only concerning the design of actual products or services, but, more strikingly, shaping and influencing the image and norms of markets (Harrison & Kjellberg, 2016). Harrison and Kjellberg (2016) argue that research related to the connection between users and markets generally remains discrepant, indicating that the influence of users on markets tends to be both understated and exaggerated. Their study reviews five subprocesses of market shaping in which users can be involved, namely "qualifying goods, fashioning modes of exchange, configuring actors, establishing market norms and generating market representations" (Harrison & Kjellberg, 2016, p.1). They further claim that user influence

varies both between markets and in the extent of influence on each of the subprocesses. Thus, in some market environments, users may take on rather passive roles, while in others they more dominantly influence market shape.

Another stream of research addresses the phenomenon of lead users, or consumers, as sources of innovation (Schweisfurth & Raasch, 2015; Von Hippel, 1986; Wadell, Ölundh Sandström, Björk and Magnusson, 2013). As the inventor of the term ‘lead users’, Von Hippel (1986, p.1) defines them as “users whose present strong needs will become general in a marketplace months or years in the future”. Due to their predictive capability, lead users can be used as a source for foreseeing potential market developments, as well as for the development of actual product innovation concepts. Von Hippel (1986) further claims that lead users can be particularly important in industries that are frequently subject to changes, and are inevitable for successful market research. Related to user influence, Von Hippel’s (1986) theory on lead users also critically distinguishes between different types of markets, exemplified by the contrasting markets of consumer goods and industrial goods. The author describes trend identification to be rather difficult in the consumer goods industry due to the inconsistency of consumer perceptions of consumer goods.

Another dimension of consumer impact on innovation strategy considers that consumers, when faced with product innovations or altered technologies of the products they use, are likely to adhere to the products or services they have experienced to be positive for them (Kim & Pennings, 2009). This may hamper the adoption of innovation and thus the innovation’s success. Kim & Pennings (2009) argue that one positive contributor to innovation adoption is active consumer education regarding the introduced innovation. Furthermore, engaging ambassadors for products or services positively contributes to innovation adoption.

According to a projective report on the consumer sector (Benson-Armer, Noble & Thiel, 2015), the main forces driving consumers in the FMCG industry are changing consumer demographics, geopolitical factors evolving, new personal consumption patterns, technological advancements, and structural shifts in industries. Please find the detailed overview of the driving forces in Appendix A. These forces should respectively be considered in the development of innovation strategies according to their relevance and applicability for the industry a company operates in. Given these drivers for consumer behaviour, a study by

Naspetti, Mandolesi, Buysse, Latvala, Nicholas, Padel, Van Loo and Zanolli (2021) on consumer perception of sustainability revealed that consumers were less likely to be attracted to organic dairy products if these products did not address common concerns on ethics or generated benefits for society in general, highlighting the relevance of meeting the highly sensitive demands consumers raise towards the products they consume.

2.2.1.4 Environmental Regulations

The effects of governmental influence on innovation in companies are twofold. On the one hand, government regulations can and should support innovation activities (Jaumotte & Pain, 2005; Pavitt & Walker, 1976; Rothwell & Zegveld, 1988). This may be done by the formulation of governmental policies that enhance "the innovatory potential of companies" (Rothwell & Zegveld, 1988, p.19). On the other hand, government regulations are said to be likely to stifle innovation (Lim & Prakash, 2014; Ramanathan, Black, Nath & Muyldermans, 2010). Ramanathan et al. (2010) emphasise that the negative impact of environmental regulations on innovation is particularly important to contemplate in the short run.

Although the 'Porter Hypothesis' established in 1995 states that (environmental) regulations do not necessarily have a bad effect on firms (Ramanathan, Ramanathan & Bentley, 2018), but may even promote the introduction of new technologies, which is referred to as 'the innovation effect' (Wagner, 2004), there are, by contrast, several studies suggesting that there is either no or even a negative relationship between these regulations and the performance of companies (Aras, Aybars & Kutlu, 2010; Borsatto & Amui, 2019; Brammer, Brooks & Pavelin, 2006; Trevlopoulos, Tsalis, Evangelinos, Tsagarakis, Vatalis & Nikolaou, 2021; Netherlands Ministry of Economic Affairs, 1972 cited in Ashford & Heaton, 1976; Chase Econometrics Associates, Inc., 1972 cited in Ashford & Heaton, 1976). This discrepancy in academic literature can be explained by the flexibility that regulations do or do not grant companies. While stricter regulations that imply less flexibility for firms lead to lower effectiveness in terms of innovation capabilities and financial performance, regulations that allow more flexibility tend to increase innovation capabilities and thus lead to improved financial performance (Ramanathan, He, Black, Ghobadian, & Galleary, 2017; Ramanathan, Ramanathan & Bentley, 2018).

However, literature suggests that the impact of government regulation is not only dependent on the degree of flexibility it provides to the firms but must be considered in conjunction with several other factors. For example, while large firms can often benefit from a rather stimulating effect of regulations on innovation, it is assumed that comparatively small firms may be affected significantly differently by the same regulations (Ashford & Heaton, 1976; Borsatto & Amui, 2019). Ashford and Heaton (1976) further state that a firm's response to regulations depends not only on its size but also on the industry it operates in. The authors add that the mode of regulation, for example whether it is standard-setting or incentive-focused, influences its correlation with innovation. Blind (2012) complements that product legislations including environmental laws as a specific form of regulation can influence innovation activities as well. More specifically, it can be assumed that such legislation has a negative short-term influence, whereas innovation projects of companies can benefit from it in the long term. Borsatto and Amui (2019) add the degree of internationalisation to the above factors, which moderates the influence of environmental regulation on innovation, as the competitiveness of countries affects innovation in a negative way.

2.2.2 Firm-Level Factors Influencing Innovation Strategies

Next to the factors influencing innovation strategies stemming from the industry level, literature addresses several factors that influence innovation strategies that are originated in individual characteristics of the firm. A number of these factors will be presented in the following, based on frequency of appearance, and determined relevance in existing research.

2.2.2.1 Internal Strengths and Weaknesses

According to Schilling (2017a), the company's strengths and weaknesses play a vital role in innovation strategy formulation. Well-known tools to evaluate company strengths and weaknesses are Porter's Value Chain Analysis (Schilling, 2017a) and Barney's Resource Based View (RBV) (1991)(Barney, 1991). The former elaborates on the concept of 'sustainable competitive advantage', which is defined as a strategy a firm employs that cannot be imitated or simultaneously obtained by its current and potential competitors for a certain amount of time(Barney, 1991). The outcome of the Value Chain Analysis pinpoints the elements that are a potential source of sustainable competitive advantage. In relation to the phenomenon of sustainable competitive advantage, Barney (1991) introduced the aspects of valuable, rare, inimitable and organized (VRIO) resources and summarised these characteristics in his RBV.

If one or several resources of a firm can be characterized with the four VRIO aspects, they are likely to be a source of sustainable competitive advantage. Choosing the type of innovation therefore greatly depends on the strengths and weaknesses of a company in relation to their competitors. In his article ‘Strategic Innovation’, Markides (1997) supports this argument, explaining companies should either utilize their existing core competencies in order to develop novel products or processes, or expand their assets and build new knowledge through learning to successfully innovate. Also, assessing the unique competencies a company possesses in order to meet customer needs can display an aid for successfully competing in the market (Markides, 1997).

2.2.2.2 Strategic Intent

In 1989, Hamel & Prahalad (1989) initially introduced the concept of strategic intent, which has since gained wide acceptance in research and academia. They describe a company’s strategic intent as a long-term, strong purpose to reach an ambitious goal. The intent is underscored by a particular management style directed towards achieving the ambitious goal by emphasizing the communication of a strong vision that was co-developed with employees, and most importantly, stresses the ultimate value for the organization (Hamel & Prahalad, 1989). The distinction between strategic intent and other models of strategy lies in the fact that strategic intent creates a long-term, greater goal for the organization, while particularly assessing existing gaps related to the firm’s resources and capabilities that need to be overcome to achieve this higher goal (Schilling, 2017a).

In the particular case of mature industries, Diekhof & Cantner (2017) argue that the main intentions of new entrants to an established industry are often not primarily profit-driven but rather relate to other aspects such as social change. Due to the general lack of dominant design competencies, these new entrants often fail to exploit established technologies, thus focus on introducing offerings differing from those offered by incumbents. As a result, the authors specifically describe that incumbent firms often focus on incremental improvements in their existing product offerings, which prevents them from transitioning into, for example, environmentally friendlier solutions. The strategic intent of incumbent companies, in other words their long-term aspirations, is therefore considered highly relevant for innovative activity towards a generally changed economic and ecological mindset.

2.2.2.3 Asset and Resource Base

Since "the resources ... of a firm are the central considerations in formulating its strategy" (Grant, 1991, p.20), the resources – or assets – should be analysed especially with regard to their specificity to determine the corresponding implications for strategy development. More precisely, the significant implication of asset specificity regarding the extent to which a company's assets can be used for purposes other than those initially intended (IGI Global, 2021) should be taken into account. Amongst others they affect the financing decisions of firms and might lead to a strategic advantage – or disadvantage. Williamson (1988) argues that a high asset specificity usually implies that the company finances expenses through equity instead of debt.

Hill and Rothaermel (2003) emphasize the possibility of incumbent failure as a reaction to the appearance of new technologies, as elaborated already by Christensen (1997). According to the authors and based on the resource dependence theory (Pfeffer & Salancik, 1978) the firms' internal resources and their allocation are "designed to optimize the profitability of the firm's current operations" (Hill & Rothaermel, 2003, p.5). This, in turn, might especially present a challenge for incumbent firms, as the allocation of their resources is often not prepared to optimize a new operational approach due to the commonly high specificity of their assets. Thereby, incumbent firms might fail to adapt their operations to pursue a new purpose – or, to innovate – especially compared to new market entrants. In comparison, new entrant's assets tend to not yet be ideally allocated but rather unspecific and flexible, which can, in the context of radical innovation, often lead to a pioneering behaviour of these firms (Hill & Rothaermel, 2003).

2.2.2.4 Innovation Process Design

An innovation process usually entails several contributing elements, which Roper, Du, and Love (2008) suggest to form what they call the innovation value chain that consists of a 'recursive process of knowledge sourcing, transformation, and exploitation'. According to their study, knowledge sourcing can be practiced in various ways, namely research and development (R&D), forward sourcing through client and customer contacts, backward sourcing through suppliers or consultants, horizontally through competitors or joint ventures, and publicly through institutions such as universities or research institutes. To successfully source knowledge, companies must place emphasis on building strong relationships with the

mentioned knowledge sources (apart from internal sources) to create beneficial economies of scope (Roper, Du & Love, 2008). Besides the actual routes of knowledge sourcing, Roper, Du and Love (2008) also highlight that company size influences the benefits that can be derived from different knowledge sources: here, multinational companies tend to rather pursue public knowledge sourcing than internal R&D, while firms with financial limitations tend to engage in horizontal knowledge sourcing. Related to the firm's ability to innovate, the authors found that diversified knowledge sourcing positively influences innovation.

In a comparative study on lead users as a source of innovation and connected to Von Hippel's (1986) approach, Schweisfurth (2017) categorizes lead users into internal lead users (employees) and external lead users. The author's findings show that the quality of ideas contributed by external lead users tends to be higher than the idea quality of internal lead users, however both categories of lead users contribute to innovation and thus influence strategic choices in innovation management. Despite the degree of user influence, the direction of such influence is also noteworthy, particularly in the case of firms engaging users by assigning them certain roles in the process, most commonly apparent in new product development. Hence, awarding users with roles can be assumed aim for steering user influence in a certain direction to ultimately benefit from the resulting user engagement (Harrison & Kjellberg, 2016).

In their study on the New Zealand dairy industry, Hartwich and Negro (2010) highlight the relevance of partnerships particularly in relation to innovation, as it emerges based on the collaboration of various actors within the industry, which differently contribute to the process. The main parties within the innovation value chain are agents from the private sector agents from the public sector and agents representing industry interests; all following diverse goals (Hartwich & Negro, 2010). They concluded that companies in the dairy sector need to respect the various agents involved in the innovation process and their diverse interests when taking strategic decisions.

Schilling (2017b) discusses the implications of different innovation process designs especially in regard to the internal management of new product development processes. The author explains that some process characteristics are particularly beneficial. For example, the stage-gate approach which is implemented by about 60% of firms is said to reduce the time needed for the development of a new product, leading to an increased "ratio of internally developed

products that result in commercial projects” (Schilling, 2017b, p.252). Cooper and Kleinschmidt (2001) emphasize the benefits of the stage-gate approach by elaborating how it incorporates key lessons regarding the improvement of success chances and the time to market. Process designs as the ‘Quality Function Deployment’ and ‘Design for Manufacturing’ are usually implemented to improve the product-customer fit as well as the production process by “lowering costs and increasing product quality” (Schilling, 2017b, p.255).

2.2.2.5 Ownership Structure, Leadership and Organizational Culture

Literature suggests several aspects of organizational culture that have an impact on innovation and innovation management in organizations. These include power concentration, personalism, paternalism, expectant posture, formalism, impunity, personal loyalty, conflict avoidance and flexibility (Bruno, 2011). While some of these factors such as personalism or flexibility have a positive impact on a company's innovation capability, other factors, particularly power concentration, formalism, and conflict avoidance, should be reduced to promote an innovation-friendly corporate culture.

Since both factors with a positive and factors with a negative influence on the corporate and innovation culture are described as closely interwoven with the leadership within a company (Bruno, 2011), it can be deduced that not only the overall organizational culture but also the leadership culture has an impact on corporate innovation. Bruno (2011) emphasizes that executives’ attitudes and behaviours are especially influential because they affect "the involvement and effective participation of all the stakeholders of the organization" in the context of a company's innovation. An interesting observation of a study in this respect is that 65% of the senior executives surveyed are "generally disappointed in their ability to stimulate innovation" (Barsh, Capozzi & Davidson, 2008, p.38). As stated by Oke, Munshi & Walumbwa (2009), awareness of the fact that a leadership formula for success does not exist, but that different leadership styles are required for different innovation activities, should be awakened. Generally, however, it can be said that a mix of transformational and transactional leadership is required in order to successfully innovate (Oke, Munshi & Walumbwa, 2009).

Although a growing separation between executive management and ownership in public companies can be observed (Berle & Means, 1933), literature has established the assumption that effects of leadership on organizations are nevertheless influenced and, in some cases,

moderated by the ownership structure of the company (Cui, Li, Meyer & Li, 2015). In order to be congruent with both the ownership and the leadership of a firm, the organizational fit of strategic objectives and supporting resources should be sufficiently considered (Cui et al., 2015). A comparison of cooperatives and non-cooperatives, which differ, among others but not exclusively, in terms of ownership, shows that the priority of innovation is lower in cooperatives than in other firms (Brat, Martínez & Ouchene, 2016). The reason for this lies in the higher weighting of the social role of cooperatives, which shifts the focus to supporting the social economy and improving sustainable development (Brat, Martínez & Ouchene, 2016). In contrast to the non-cooperatives studied, however, many cooperatives already rely on decentralised innovation management (Brat, Martínez & Ouchene, 2016), which, in contrast to the aforementioned power concentration, creates a corporate culture that, in theory, promotes innovation.

In summary, to develop a successful innovation strategy, a company should be aware of the influence of its ownership structure, its leadership, and its organizational culture on innovation projects and, if necessary, engage in suitable adjustments.

2.2.2.6 Path Dependency

The term path dependency refers to the phenomenon that “end results depend greatly on the events that took place leading up to the outcome” (Schilling, 2017c, p.76) or, in other words, to situations “where present strategic activity is induced by its past” (Thietart, 2015, p.12). Path dependency has a significant influence on general strategic activity: concurrently with the factors ‘chance’ and ‘self-organization’ it leads to the fact that dynamics in a company are relatively random (Thietart, 2015). According to Thietart (2015), this would lead to the timing of strategic activity being uncontrollable. The impact of path dependency is described in a somewhat less radical way by Min, Wang, Liu and Huang (2018), according to which it would not lead to random, but to asymmetric responses of strategic behaviour. A study of the strategic actions and their timing of managers from the dairy processing company Danone summarily revealed that there is a “need to be far more modest in relating choice to consequences, since strategy consists of both content and timing” (Thietart, 2015, p.30). Generally, it can be assumed at this point that the degree of path dependency influences the way of strategy formulation.

Another perspective on the importance of path dependency for the strategic direction of a company and thus also for its innovation strategy is provided by Schilling (Schilling, 2017a). According to the author, path dependent resources of a firm, such as *knowledge* or *talent*, can be difficult for competitors to imitate and can thus likely lead to a first-mover advantage based on path dependency. Hill and Rothaermal (2003) further claim that established organizations that operate within relatively stable economic environments tend to adhere to long-developed routines and processes as they aim to maximize productivity and efficiency, focused on their existing offerings. In consequence, these organizations frequently show a limited degree of engagement in innovative activities, resulting in limited ability to respond to disruptive market changes.

2.2.2.7 *Timing*

Timing plays a decisive role in the context of strategy formulation. A common model incorporated in many academic contributions in the field of innovation is the '(technology) S-curve', which visualizes the need for innovation by illustrating decreasing product performance with the passing of time. However, Christensen (1992) already emphasized significant limitations of this model. According to the author, the (technology) S-curve framework offers useful insights on an industry level, but not on a managerial level. For this reason, more specific consideration should be placed on the appropriate time for the respective company to innovate and the impact timing might have on the success of its innovation.

Academic research on the timing of innovation and the timing of entry into new markets often divides companies into three categories: first movers, early followers and late entrants (Schilling, 2017d). While early research often describes first movers to have special advantages - specifically, long-term competitive advantages based on a "direct relationship between order of entry ... and market share" (Kerin, Varadarajan & Peterson, 1992, p.1) - this approach has meanwhile been put into a relative perspective. More recent research suggests that the imitation of competitors stimulates learning and reveals actual opportunities to innovate - which in turn would lead to a higher product innovation frequency among imitators (Katila & Chen, 2008). Katila and Chen (2008) further add, however, that companies can have a significant innovation head start if their competitors are slow to catch up. They conclude by recommending companies to combine both approaches in terms of timing innovation.

For the context of this paper, it is derived from existing research that the optimal timing of innovation depends on the goal of the innovation project. While market pioneering may primarily offer advantages in terms of the positioning of a firm and in the best case provides a short-term 'head start' advantage (Katila & Chen, 2008) but not a direct actual competitive advantage (Kerin, Varadarajan & Peterson, 1992), a firm may benefit more significantly from pursuing innovation after observing the innovation activities of its competitors and thereby innovating more effectively itself (Katila & Chen, 2008). Both approaches, however, require that a firm's individual timing of innovation is aligned with, though not dependent on that of its competitors.

2.3 Summary & Preliminary Framework

The literature review provides a general understanding of innovation as a concept, innovation strategy considerations and its relation to business strategy, followed by a detailed overview of eleven factors that influence the formulation of innovation strategies of firms in mature markets. The factors presented were identified by synthesizing existing literature streams related to innovation strategy and the elements that influence innovation strategy formulation. Given the fact that no comparable research has yet been conducted on the factors influencing innovation strategies holistically within mature industries, the aim of this study is to provide a preliminary framework that provides an overview of such factors.

The literature review informed the conceptual framework by building the foundation for the study and allowing the researchers to identify relevant themes in literature (Saunders, Lewis & Thornhill, 2016a). The identified factors are factors influencing innovation strategies of firms in mature markets. Choosing the dairy industry as the case example for a mature market is expected to allow for an appropriate degree of generalization, considering the scope of this study. On the basis of the reviewed literature, three assumptions were made by the researchers:

- 1. The presented elements influence innovation strategies of firms in mature markets.*
- 2. The presented elements influencing firms' innovation strategies can be divided into two relevant dimensions: the industry level and the firm level.*
- 3. The presented elements influence innovation strategies of firms in mature markets to different extents.*

The preliminary framework presented below was developed based on the conducted literature review, and is extended, confirmed, or adapted based on the conducted analysis of the generated primary data.

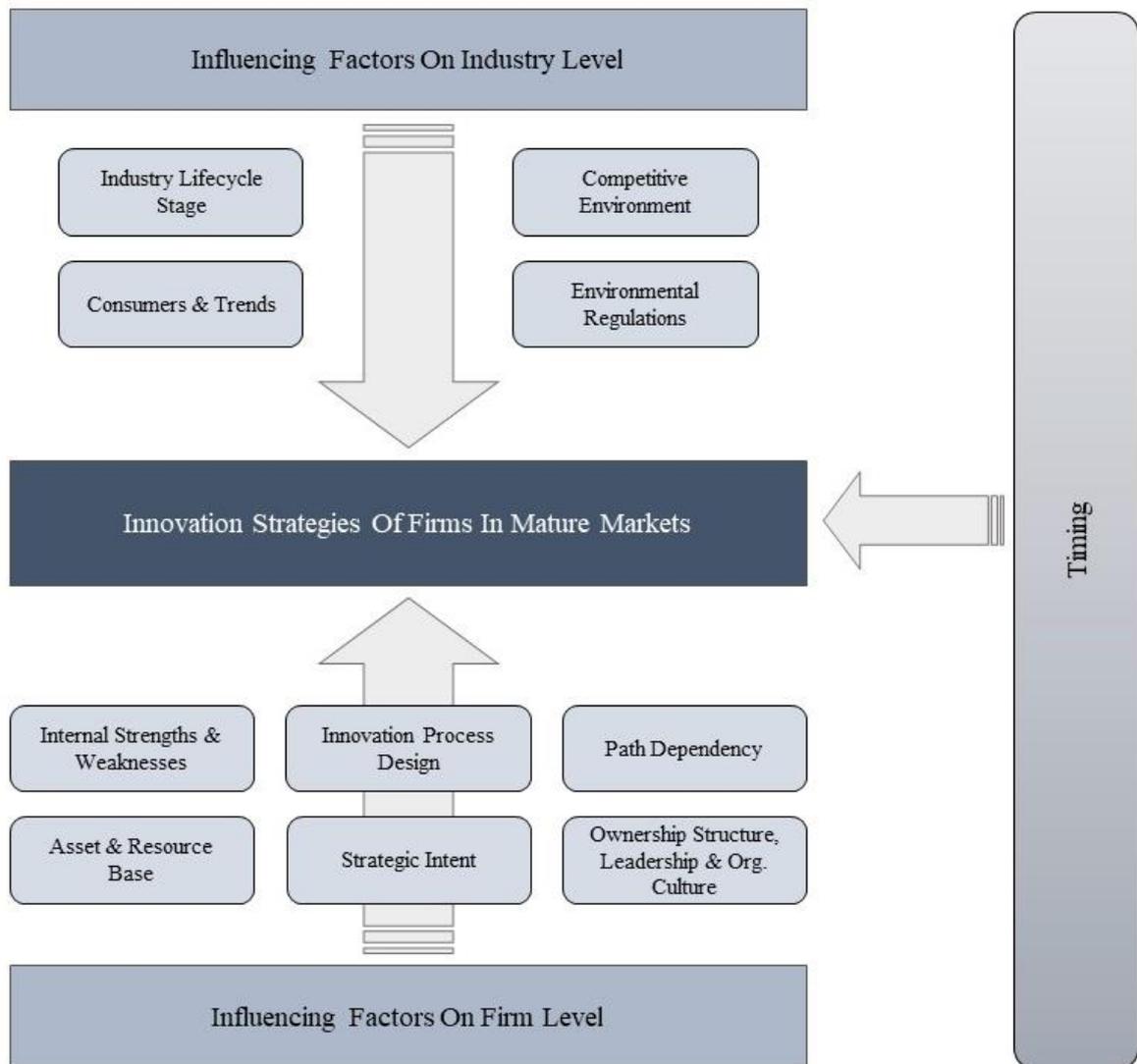


Figure 3: Preliminary Framework on Factors Influencing Innovation Strategy Development

The presented factors were chosen based on the frequency and relevance ascribed to them in existing literature streams, while the way they are presented in the preliminary framework does not indicate any rank, order, or relationship among them but solely indicates the type of level they stem from. In explanation, the elements ‘strategic intent’ and ‘innovation process design’ do not have any different importance than the other presented elements. The factor ‘timing’ is considered as overarching, as it relates to both industry level and firm level.

3. Methodology

This chapter provides information on the methods used for conducting this study. Starting with the chosen research approach and its design, the selected case is presented in detail regarding its context and the units of analysis. Further, the data sources and the method for data collection are explained, followed by the methods for data analysis and ending with concerns regarding validity and reliability as well as the limitations to this study.

3.1 Research Approach & Research Design

The research approach builds the fundamental plan to the development of theory (Saunders, Lewis, Thornhill & Bristow, 2016), and its design represents the general aim of the research, and the detailed plan for answering the research question (Saunders, Lewis & Thornhill, 2016b).

This study intends to explore the research gap articulated in Chapter 2 by investigating the factors influencing innovation strategies of firms in mature markets. Given the diversity in approaches and techniques in strategy formulation, particularly in the context of innovation, the research approach of this thesis is designed as an abductive approach. Testable conclusions were drawn from existing literature (Saunders et al., 2016), while the primary data collection was used to identify patterns in the findings that allowed an assessment of the relevance of the previously identified influencing factors for the context of the study (Creswell & Creswell, 2018b). An abductive approach allows for the emergence of theories and themes during the research process, which ultimately enables to generate new theory, modify or advance a relevant theory (Saunders et al., 2016).

The aforementioned research approach is implemented by a qualitative study, as this type of study facilitates the “exploring and understanding [of] the meaning individuals or groups ascribe to a social or human problem” (Creswell & Creswell, 2018c, p.41). As opposed to quantitative research, which usually implies large samples and quantifiable survey data, qualitative studies aim for diverse individual viewpoints and experiences, gathered in rich and in-depth data sets (Saunders et al., 2016). Although a quantitative approach would not have been inapt for this study’s research question, the qualitative approach was preferred to gain an

in-depth understanding of the topic at hand for several methodological aspects. Firstly, qualitative research aims to build the foundation of a theory creation regarding the subject matter to be investigated, through “inductively building from particular to general themes, and the researcher[s] making interpretations of the meaning of the data” (Creswell & Creswell, 2018c, p.41). Secondly, since the intention of this study is to contribute to the existing research by exploring a research problem that has not been researched yet in a comparable manner, the qualitative research method is considered adequate (Creswell & Creswell, 2018c). The explorative purpose of this research is furthermore supported by the fact that a qualitative study allows questions to emerge during the research process (Creswell & Creswell, 2018c). Conclusively, qualitative studies are purposed to build a fundamental understanding of a phenomenon and its contextual aspects by understanding and amplifying beliefs and behaviours. Thus, a qualitative study was perceived as most value-adding, given the underlying limitations of time and scope outlined in section 1.5.

The research design links together the research approach and the resulting methods used for data collection and analysis (Saunders, Lewis & Thornhill, 2016b). To address the research question, a case study design was chosen. Case studies can be designed as single and multiple case studies (Yin, 2018a). They contextually investigate phenomena in a real-life setting within a particular context, one or several cases within this context, units of analysis, and potential sub-units (Yin, 2018b). Case study research commences with a thorough review of existing literature and provides the theoretical foundation and background for the study. Yin (2018b) highlights that multiple case studies are often considered to be more captivating than single case studies, but they simultaneously have a high requirement of resources and are time-consuming. Due to the limited time and scope of this study, a single-case study design was chosen. The case under study is the dairy industry, purposely chosen due to limited existing research (Saunders, Lewis & Thornhill, 2016b) and its increasing relevance due to recent developments and changes in the industry. The context of the study is the mature industry lifecycle stage of the dairy industry, while the units of analysis are the companies operating within the industry. The sub-units of the study are the participating interviewees as representatives of these companies. As the units and sub-units of this study can be logically identified and enable a focus more narrow than “the global nature of an organization” (Yin, 2018a, p.50), the study follows the embedded rather than the holistic approach.

During the research process, the researchers took on the role of informed interviewers, while focusing on an un-biased and neutral perspective towards the contents discussed in the interviews. The researchers suggest complementing the conducted qualitative research with quantitative research that generates statistically analysable, numbered data (Creswell & Creswell, 2018c) specifying the absolute impact of individual factors on decision making and strategy formulation in addition to the relative impact surveyed in the presented study.

3.2 Case Selection & Data Sources

The dairy industry is chosen as the case under consideration in the context of mature industries for two reasons. First, the suitability of this industry as an example for a mature industry is apparent given the specifics analysed in Chapter 4.1. Through its evident characteristics of a mature industry, an appropriate degree of generalizability of the academic findings is aimed for. Second, the study's research outcomes are assumed to provide relevant and value-adding insights for this specific industry, aiming to contribute to the identified research gap. While the dairy industry is considered the case of the undertaken study, four units of analysis compose the scope of this case, represented by delegates of accordingly classified companies:

Interviewees with a background in the dairy industry represent the first two categories: experts from dairy firms that exclusively operate in the dairy industry (in the following Dairy Experts), and representatives of companies that participate, amongst others but not only, in the dairy market (in the following Industry Participants). These participants are expected to enhance clarity about innovation-supporting factors and arguments specifically opposing a PBDA market-entry. Examples of interviewees include top management, individuals working in corporate or product development, research and development, and experts within innovation and business development. The third category consists of interviewees that are experienced in the strategic processes of companies operating in the PBDA market segment (in the following Plant-Based Experts) that may reveal an imbalance between the expected relative influence of factors – especially the hindering ones – from the perspective of dairy companies, and the actual relevance of these factors. Industry consultants experienced in advising companies regarding product portfolio transitions in the context of evolving consumer preferences in the food industry (in the following Industry Consultants) present the fourth category of interviewees. Their insights are supposed to deliver more neutral answers regarding difficulties in innovation processes, as they result from an objective rather than subjective perspective.

Initially, a further split of the first group of interviewees, the representatives of ‘dairy-only’-firms, was intended: A differentiation between dairy companies that already innovated their operations to adapt to the PBDA trend, and companies that did not (yet) innovate to stay competitive against PBDA seemed value-adding. During the process of researching suitable companies to interview, however, it became apparent that most dairy firms either have already innovated in the PBDA, or at least have investigated potential PBDA projects. Therefore, it was refrained from splitting the first unit of analysis to avoid a too narrow group of samples. Another trade-off regarding the fourth unit of analysis had to be considered. Due to the very limited responsiveness of consultancies or persons in consulting roles it was discussed to completely renounce this group. However, a higher degree of objectivity was yet expected from a comparably small number of consultants as compared to rather subjective, less generalizable insights from the other groups of interviewees. The actual participants of this study were entirely selected and approached by the researcher. A detailed overview of the interviewed participants can be found in the following table.

Table 1: Overview of Participants

Number	Alias	Company Type	Current Position	Expertise
Dairy Experts				
1	Matthieu	Large, multinational dairy producing and processing company	VP Research & Science	22 years experience in the dairy processing industry in the US and Canada. Involved in the design of a new R&D center of his employer. A passionate advocate of dairy as a product, however well informed about trend in the dairy industry.
2	Karl*	Large, multinational dairy producing and processing company	Head of Communication, Sustainability & Public Affairs	Extensive experience as an expert in regulatory affairs and trade policies, member of various boards including the Danish Dairy Board and the European Dairy Association. Activities involved lobby work for the milk industry as well as environmental sustainability.
3	Claire*	Large, multinational dairy producing and processing company	Head of Product & Process Design and Open Innovation	Experienced in research and food product development as a leader in several companies selling medical food products, among others. Heading the product development department of a large global dairy processing company and leader of open innovation activities.

Industry Participants				
4	Michael	Multinational functional foods producing company specialised in vegan nutrition	Managing Director Germany & Austria	More than 20 years experience in the FMCG industry, ranging from food to liquids to functional foods. Has an impressive degree of knowledge and insights due to his exposure to diverse business approaches and product types. Able to provide insights from several perspectives but particularly on innovation success and scalability.
5	Albert	Large, multinational beverages producing company, offering dairy and PBDA products	Senior Director Global Marketing, Dairy & Plant-Based Beverages	20 years experience in the FMCG industry, specialized in marketing on a global level, leader of the dairy and plant-based beverages segment. Experienced across continents in the industry and therefore possesses a diverse set of knowledge in marketing strategy.
6	Nicole**	Large, multinational food-processing company offering dairy and PBDA products	Market Strategy Manager	Working in market strategy for a global FMCG company focused on dairy and water products which has been growing in the plant-based market segment since 2016.
7	Isabel**	Large, multinational food-producing company offering dairy and PBDA products	Plant Based Acceleration Director	More than 15 years experience in the FMCG industry of a global FMCG company focused on dairy and water products, heading the business development. Driving the development of plant-based alternatives including specialized nutrition for allergy patients and children. Particularly knowledgeable in the environment of mature markets.
Plant-based Experts				
8	Jakob	German food-producing company specialised in the production of meat and meat alternatives	Chief Sales Officer	14 years experience in the FMCG industry including global players in alcoholic and non-alcoholic beverages. His most recent position is within a leading German producer of meat and sausages, which has recently started to innovate in the plant-based meat alternative segment showing growing with an extremely fast pace. Knowledgeable in consumer insights and the transition to producing PBDA products as well as traditional products.
9	Samuel	Plant-based food and beverage producing company, former dairy company	VP of Innovation and Product Introduction	Research professional with a focus on agricultural and food products, working for one of the most well-known companies that have transitioned from dairy-only products to plant-based only products. Highly knowledgeable in consumer insights and trend development due to his role in innovation management and product introduction.
Industry Consultants				
10	Greta	Initiative consulting dairy producers regarding the transition towards PBDA	CEO & Founder	Experienced professional in the start-up environment and founder of one of the few companies that consults farmers in the transition to plant-based sustainable farming. Knowledgeable in the issues related to dairy producing farmers and their influence on decision making.

* same company

** same company

The above presented participants were chosen not only based on their current position but also considering their previous experience. A special focus was put on executives with an extensive experience in several positions and optimally with a background from different dairy industry-

related companies. The accumulated insights gained through interrogating the four groups of interviewees provided the researchers with a sound understanding of the different processual elements to be considered when answering the research question, creating a well-rounded depiction of the case industry. Additionally, appropriate findings from multiple secondary data sources are incorporated to enrich the statements and derivations of primary data.

3.3 Data Collection

Specifying the qualitative approach of this study, a study consisting of semi-structured interviews with a flexible number of participants (Saunders, Lewis & Thornhill, 2016b) and an analysis of several industry and annual reports was conducted. Interviews mostly included open-ended questions to allow for the emergence of data by gathering first-hand practical information about relevant key issues, ultimately contributing to informing the main research question (Saunders, Lewis & Thornhill, 2016c). The questionnaire for the hereafter elaborated groups of interviewees was composed of two parts. The first part consisted of a set of questions serving to determine the interviewees' attitude towards strategy and innovation in general, and their perception of the market environment their companies operate in. The second part included a collection of specific questions that shed light on the ongoing or planned innovation activities of the respective companies. These questions varied between the groups of interviewees, depending on their corporate background. The described interview guidelines can be found in Appendix B.

The division of the interview questionnaire into two sections was motivated by two reasons. First, exploring the commonalities and differences in the basic understanding of the theoretical concepts underlying this work should make the units of analysis comparable to facilitate a generalization of subsequent, more specific findings. Second, the questions tailored to the four categories should allow for a more in-depth understanding of the according context. Therefore, where appropriate, a conditional logic was used when selecting further questions that enabled more relevant insights to be gained based on previous answers. During the research process, the data collection procedure was adapted in the sense that the initially developed interview questionnaire was treated as a pool of potential questions from which the ultimately posed questions were chosen according to the evolving focus of the interview.

The adequate number of interviewees was determined based on the research approach and the according type of experts chosen to ensure reliability and validity. Ten suitable interview

partners were selected in a non-probabilistic approach. First, a purposive selection (Business Research Methodology, 2021) based on the researchers' assessment regarding relevant professional experience and diversity of backgrounds was made. Incorporating aspects of the theoretical sampling method, further samples were selected until now additional input was expected to stem from these (Saunders, Lewis & Thornhill, 2016b). The researchers aimed to reach saturation (Charmaz, 2006 cited in Creswell & Creswell, 2018c), which, however, underlies certain boundaries due to the limited access to primary data.

Following a research approach as the one chosen for this study, data is typically collected in the participant's setting (Creswell & Creswell, 2018c), which is, besides the actors of the study themselves, one relevant aspect shaping the circumstances of a qualitative study (Miles & Huberman, 1994). In the context of this work, this can be understood by the fact that the interviews were conducted via online video conferencing tools of their choice. The duration for a single interview ranged between 30 and 60 minutes, depending on the number of questions asked following the conditional logic. While the first part of the each interview was held rather structured and consisted of a concise introduction to the topic and of the interviewers, and clarifies the interview procedure, the second and third part took place in a less structured and more conditional way: in the second part of the interview, the prepared questions were elaborated and adapted following the direction of the answers, while the final part left room for further discussion based on the participants' perceived importance of additional sub-topics. The primary information derived from the interviews was recorded and transcribed to ensure accuracy.

3.4 Data Analysis

The data analysis in a research study represents the translation and sense-making of the data gathered during the primary data collection process (Creswell & Creswell, 2018). In qualitative studies, the data analysis often runs as a parallel process to the ongoing data collection. Since qualitative interview data is often rich and contains both less and more relevant information, winnowing and coding the collected data represents an important step during the data analysis as it allows the researchers to focus on the key messages that can contribute to answering the research questions. The data analysis of this study followed a template approach as a form of thematic analysis and allows for the analysis of rich qualitative data sets to identify patterns and themes, and their interrelationships (Saunders, Lewis & Thornhill, 2016d).

Creswell and Creswell (Creswell & Creswell, 2018d) recommend the data analysis and coding process to follow five constitutive steps which were applied in this study's analysis. Firstly, the information from the conducted interviews was transcribed and divided into the four categories of interviewees presented in section 1.2. Secondly, the transcripts were roughly reviewed to extract initial general insights and gain an overview of the topics discussed. Step three involved the coding of the transcribed data via the software 'MAXQDA' which is a tool to organize, structure and code qualitative data. The process of coding can be described as a categorization and interrelation of the generated data (Strauss & Corbin, 1998). The codes for this research were created in several steps, starting with the review of the first three transcripts and the creation of a preliminary code template based on the researchers' informed judgement of the relevance of the statements for the study. A list of the preliminary codes based on the first transcripts was created which was then applied in subsequent transcripts. The data items were constantly compared with each other, also resulting in some iterations of the code template by adding new codes or removing existing ones as new data emerged (Saunders, Lewis & Thornhill, 2016b). After completion of the coding in all transcripts, including iterations such as addition and deletion of codes based on the richness of information, the codes were organized in categories reflecting the eleven factors identified in the literature review. Five factors were added based on insights from the interviews that had not been considered in the preliminary review of the literature. The code list and categories can be found in Appendix C. The categorization also reflects the next step in qualitative data analysis, which involves generating and describing themes that elaborate on various factors of the study, resulting in more detailed descriptions beneficial for case studies (Creswell & Creswell, 2018). The determined themes represent the major findings in the study and were used to divide the data analysis section into its different parts and can simultaneously be used to compare statements from the different units of analysis.

The findings from primary data were linked to the theoretical aspects found in existing research to establish connections, test and advance the preliminary framework. The potential of the researchers' bias through excessive reliance on existing theory was reduced through the continuous focus on the primary data collected (Glaser, 1978). Categories were built from the newly collected data, while the initially reviewed literature served as a complementary source to conduct the interviews in an informed manner. The coding process was split into two sequences, where both researchers coded the interviews separately prior to developing the

preliminary code list, aiming to reduce bias in both researchers, as the code lists were developed independently from the opinion of the other person.

3.5 Validity, Reliability & Ethical Considerations

As validity and reliability are central factors influencing the quality of qualitative research (Saunders, Lewis & Thornhill, 2016b), several methods to increase these factors are applied. While the validity of the collected data is optimized through providing an accurate and reflective data analysis, the reliability is achieved by ensuring consistency (Saunders, Lewis & Thornhill, 2016b).

Due to the limited scope of this study, a certain degree of bias was expected. By selecting a wider variety of interviewees with diversity in background and opinions, this issue will be addressed. Especially the data collected by interviewing consultants, whose personal involvement in the decision for or against innovation activities is considered rather moderate, was meant to discover biased answers from the other participants, whose individual affectedness might have been comparably high. Using multiple sources of evidence is expected to positively influence construct validity as explained by (Yin, 2018b). In order to avoid misaligned answers based on misperceptions of the questions posed, the topic and related context was stated clearly, using thorough descriptions of the research setting (Creswell & Creswell, 2018d). Further, to prevent imprecise responses being induced by unfavourable circumstances such as the date and the specific time of the interview, which could influence the ability and willingness to collaborate (Saunders, Lewis & Thornhill, 2016b), the researchers decided to let the participants determine these parameters. As different forms of biases may not only influence the interviewees' responses, but to certain extent also the researchers handling of the collected data, seminars including peer debriefings increased the study's validity (Creswell & Creswell, 2018d). Presenting findings from previous interviews to the study's participants validated the researchers' assumptions regarding relevant themes, which is referred to as 'Triangulation' (Creswell & Creswell, 2018d; Yin, 2018b). Finally, an external reviewer unfamiliar with the topic under discussion was consulted to review the study contents and the coherence between the study results and the derived framework, obtaining an external, more neutral viewpoint on the topic (Creswell & Creswell, 2018d).

To ensure the reliability of the processed data, the transcripts of all interviews were reviewed manually, which positively influenced the data's reliability according to Creswell and Creswell (2018c). Subsequently, the transcribed data was coded, which reduced misinterpretation based on the researchers' own biases. Here, aligning the used codes was vital to prevent inconsistency in the analysis and results (Creswell & Creswell, 2018d). Regular meetings to document and cross-check the coding process provided additional reliability (Creswell & Creswell, 2018d).

Additionally, the above-mentioned actions were implemented to enhance validity and reliability throughout the data collection and data analysis process. To address potential ethical issues during the data collection process, the study's participants could ask questions regarding the topic, the procedure and the usage of the data anytime (Saunders, Lewis & Thornhill, 2016e). However, a certain lack of transparency and candour in the responses of the interviewees influencing the validity of the data was expected due to the criticality of the circumstances within which their companies operate. More specific, the industry under study is subject to several scientific, environmental and ethical issues (Croney, 2019; Rauch & Sharp, 2005) which, in the case of the analysed companies, are not, or only partially, disclosed during the conducted interviews. This constraint is mostly based on the probability that potential bias in favour of the represented companies might be inherent in the expressed views due to probable corporate regulations. In order to reduce this aspect in the context of the work, especially critical opinions and those that contradicted the prevailing opinion as well as discrepant information were presented to closer reflect the reality of different perspectives (Creswell & Creswell, 2018d). In this regard, special attention was paid to guaranteeing the anonymity of the interview partners if demanded, ensuring an ethical analysis of the information provided (Creswell & Creswell, 2018b).

3.6 Limitations

Due to the qualitative nature and limited scope of this study the outcome underlies certain limitations. First, although case studies are considered generalizable to related theoretical propositions, (Yin, 2018b), the results may provide only limited generalizability resulting from the relatively small number of interviewees and the accordingly confined data samples (Saunders, Lewis & Thornhill, 2016b). This is rooted in the time frame available for the empirical research, which has necessitated a narrower scope. Further, the responsiveness of potential interviewees was inferior to what was expected, which made it challenging to collect

a sufficient amount of data. This may be reasoned by the specificity and potentially critical aspects of the chosen research topic.

Second, the researcher's role in the process of data collection and data analysis is supposed to set certain boundaries to the external validity, and, more specific, to the generalizability of the insights derived from the collected data. This is reasoned by the fact that "attention is focused on topics that the researcher considers meaningful or important" (Cassell & Symon, 2004, p.229). This applies to both data collection and data analysis. In more specific terms, the researcher's limited experience in qualitative research and expertise in leading semi-structured interviews may have influenced the interviewing process, as the selection of questions from the pool of questions might be partly subjective. A subtle degree of subjectivity can also not be dismissed in the context of the data analysis, as the choice of codes to be used during the coding process is, amongst others, also dependent on the interviewer's knowledge in the field of the chosen industry.

Third, it is assumed, that the outcome of this study significantly depends on the choice of participants and the specific, momentary information offered by them. Therefore, a replication of the study at a later time might lead to different outcomes, which should be kept within a reasonable frame by the appropriate documentation of the procedures (Creswell & Creswell, 2018c; Gill and Johnson, 2010 cited in Saunders et al., 2016).

Fourth, the software chosen to process and analyse the collected data is said to shape the research outcome to a certain extent, resulting from the tendency of biased interpretation of the data following the logic of the tool (Müller, 2019). The tool used for the data analysis of this thesis, MAXQDA, works with a hierarchical logic that allows to create a layered structure of categories, codes, and sub-codes. A parallel data processing with an additional tool, e.g. ATLAS.ti, might reveal further insights, as these tools facilitate the development of a data network rather than a hierarchical tree structure and expose different interrelations (Müller, 2019).

4. Findings and Analysis

4.1 Analysis of the Case Industry

The subsequent description of the industry under consideration, together with the theoretical concepts presented in Chapter 2 regarding the factors influencing innovation strategies, provides the foundation for the empirical research of this thesis. It also demonstrates the adequacy of the dairy industry to illustrate the investigated correlations for mature industries. A definition and delimitation of the dairy industry is followed by a specification of this market, structured according to the Five Forces Framework by Porter (1989).

4.1.1 *The Dairy Industry Defined*

The competitive environment in the dairy industry includes both the dairy and the PBDA segment, hence it includes companies that either produce milk, process milk, or both, and companies that produce PBDA. The dairy industry falls into the category of FMCG industries. FMCG industries can generally be characterized to be fast-changing, following global trends related to healthcare, technology and economics (Benson-Armer, Noble & Thiel, 2015). Further, these companies are subject to a variety of external factors that cause the dairy market to be one of the most volatile of all agricultural markets (Jacoby, 2017). These factors include seasonality, weather, and climate, which make the industry comparatively unpredictable, potentially resulting in production challenges (Jacoby, 2017). Other influencing factors involve consumption trends, which also affect the cyclical nature of the dairy market, and federal interventions affecting price certainty and risk management (Jacoby, 2017).

The multitude of influencing factors on the entire dairy market and their possible characteristics already indicate that the companies operating in the dairy industry should weight the individual influencing factors according to their operational focus. To enable a discussion of factors influencing innovation strategy development of firms operating in the dairy industry from different perspectives, the challenges of transitioning from a dairy-only to a dairy and PBDA-balanced product portfolio are also elaborated from the perspective of PBDA producing firms. It is assumed that the comparison of the two perspectives will reveal which external and internal factors influence decision making regarding innovation only seemingly, and factually.

Since the development of a strategy is not only, but significantly also dependent on the external factors mentioned above, which can be well assigned to the Five Forces according to Porter (1989), the industry structure of the dairy market is analysed based on the review of relating theoretical concepts considering the customer group of incumbent dairy companies, their direct current and potentially new competitors, their supplier relationship as well as the influence of new competitive products.

Although the Five Forces Framework itself does not provide a weighting of the individual factors for the industry description, in the following and throughout the entire thesis the focus primarily lies on changing consumer demands, the accompanying threat through new substitute products as well as on the ongoing competition on the dairy market as factors influencing the dairy companies' corporate and innovation strategies. The threat of new entry will be addressed only peripherally, as related research stresses the major importance of the aforementioned three factors. The delimitation of supplier relationships in the context of this thesis is reasoned by the technical diversity which characterizes the nature of suppliers. Since the first stage(s) of the dairy supply chain would go beyond the scope of this thesis, the supplier companies to be analysed would range "from engineering and packaging to food science and laboratory expertise" (Dairy Foods, 2020, n.p.).

4.1.2 Existing Competition in the Dairy Industry

Not only the supplier landscape but also that of the competition in the existing dairy market is highly diverse. This diversity can be illustrated by the observation that the largest player in the global dairy market has a market share of merely 3.5%, while the twenty largest dairy companies worldwide have a cumulative market share of 24.3% (Shahbandeh, 2019). While 45% of these companies are located in Europe, the remaining eleven companies are distributed in North America with 35% market share and 20% market share in the Asian region (Shahbandeh, 2019). If one takes into account the global distribution of the dairy products market volume, which shows that 37% of the volume is accounted for by Europe, while 29% is distributed over Oceania and 13% in North America (Shahbandeh, 2020) it is reasonable to assume that the market in North America is comparatively even further dispersed and in Europe somewhat more concentrated in this comparison. In none of the regions, however, one can speak of market dominance, which would be given if only one single market participant held at least 40% of the market shares (Financial Dictionary, 2021). Since in the case of the dairy

industry there is consequently no monopoly situation that could "eliminate competition in terms of price, quality, service, and variety" (Hannaford, 2007, p.1), it can be concluded that the relationship between the incumbent market players is indeed highly competitive. Not least for this reason, the dairy market is characterized by constant innovation in the form of new products, new flavours or new organic product lines, and along vertical supply chains by new types of packaging, which allows market participants to remain competitive by offering an improved product value (Špička, 2013).

4.1.3 The Power of Customers and Consumers

Besides end-user demand, this diversity of innovation in the conventional dairy industry is highly driven by a variety of intermediaries, shown in Figure 4.

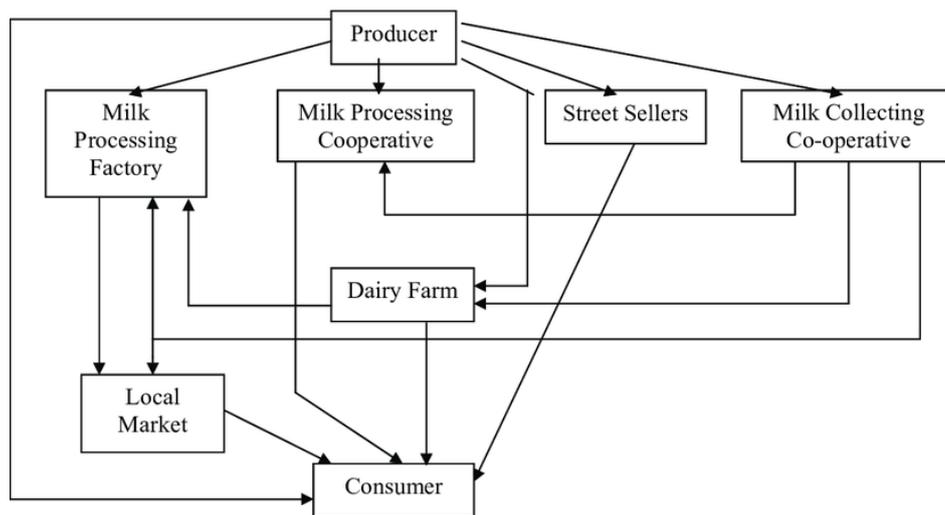


Figure 4: Marketing Channels of Milk in Farms (Artukoglu & Olgun, 2008)

The end consumer value and its consideration should be central in every stage of the supply chain in order to achieve a distinct advantage in competition (Zokaei & Hines, 2007). Within the scope of this work, primarily the influence of the demand and the behaviour of the end consumer on the incumbent dairy companies is addressed, even if in practice this influence is not always directly, but rather indirectly given. This limitation is justified by the assumption that the interest of the end consumer is decisive in every stage of the dairy value chain (Zokaei & Hines, 2007) and thus has at least an indirect effect on every form of dairy companies.

Regarding the current developments in the end consumer segment as another market force, it can be stated that recent developments have led to a shift in consumer preferences towards a

general health-oriented mindset, including but not limited to increased consumption of plant-based dairy alternatives (Aydar, Tutuncu & Ozcelik, 2020). Partially originated in the general desire to improve the nutritional value of food intake, the rising interest in environmental sustainability and the related need for a reduction of animal product consumption, as well as an increase in food intolerances, the trend towards plant-based alternatives leads to a variety of challenges for dairy producing and processing companies.

These need to be recognized and considered with adequate priority, even though the starting position for dairy companies does appear to be relatively favourable. Developments such as the increase in milk consumption, which rose by 5.2% worldwide between 2013 and 2016 (Statista Research Department, 2014), and the increase in cow's milk production, which has also risen by 6.3% in the last five years (Shahbandeh, 2021), initially point in a promising direction. Given this seemingly optimistic trend, a look into changing consumer needs to surmise how dairy industry could, if not should, evolve in the upcoming years. According to a study from 2017, 9.6% of the population of selected European countries already lived vegan and thus entirely abstained from dairy products in their diets at that time (Wunsch, 2019). In 2019, 53.1% of the participants in a study stated that they consciously abstain from consuming dairy products or would like to do so (van Gelder, 2020).

The relevance of recognizing such trends becomes clear when one considers that, despite an estimated increase in the market value of organic dairy products worldwide of around USD 9 billion from 2018 to 2024 (Wunsch, 2020a), the growth in retail sales value, represented by the compound annual growth rate (CAGR) of organic dairy products, is expected to decline latest by 2024 (Wunsch, 2020b). Considering that "disposable incomes, increasing population, and increasing health consciousness have propelled the growth of the industry" (Expert Market Research, 2021, n.p.) and there already is a positive impact on the development of demand for organic dairy products, it is even more important for the entire dairy industry - not just the organic dairy industry - to consider that the overall demand for these dairy products will nevertheless decrease.

4.1.4 Pressure Through Substitute Products

The pressing impact of PBDA on the traditional dairy industry becomes particularly clear considering a forecast showing the CAGR of dairy alternatives between 2018 and 2022.

According to the data, the CAGR for plant-based dairy alternatives over this period averages 15.1% (Coppola, 2021), while the CAGR for dairy products is estimated to be 7.35% in the same period of time (Markets Insider, 2018). This significant difference in the CAGRs demonstrates the urgency for conventional dairy companies to engage with this fast-growing industry and the accompanying potential substitute products. Not at least, this rapidly increasing demand for respective substitutes can be assumed as one of the main reasons that "by 2030, demand for cow products will have fallen by 70%" (Tubb & Seba, 2019, p.7).

The main drivers of the substitution of conventional dairy products with dairy alternatives are said to be the "desire for clean label products, compatibility with vegetarian, vegan and flexitarian lifestyles and [addressing] concerns about sustainability and animal welfare" (Bizzozero, 2019, n.p.). Looking at three of the factors most associated with sustainability – water and land use, as well as greenhouse gas emissions – it becomes apparent why dairy alternatives are gaining ground within the context of sustainability: PBDA such as soy, almond, oat or rice milk require only about 10% of the land to produce the same amount of product as cow's milk, while emitting only about one-third of the CO₂ gases (ProVeg e.V., 2019). Also, water intake in the production of plant-based milk alternatives is significantly lower than in conventional milk production. For example, the most popular plant-based milk alternatives require between 28 litres and 371 litres of water per litre of end product, while the water required to produce one litre of cow's milk amounts 628 litres (ProVeg e.V., 2019). This results in water savings in production ranging from 59% to as much as 95.5%, depending on the specific plant-based milk alternative. Concluding, a study from 2018 estimated that "the transition to a more plant-based diet could reduce land use by up to 76% and reduce greenhouse gas emissions from the food sector by up to 50%" (ProVeg e.V., 2019, p.20).

Which milks leave the biggest footprints? (per litre of milk produced)

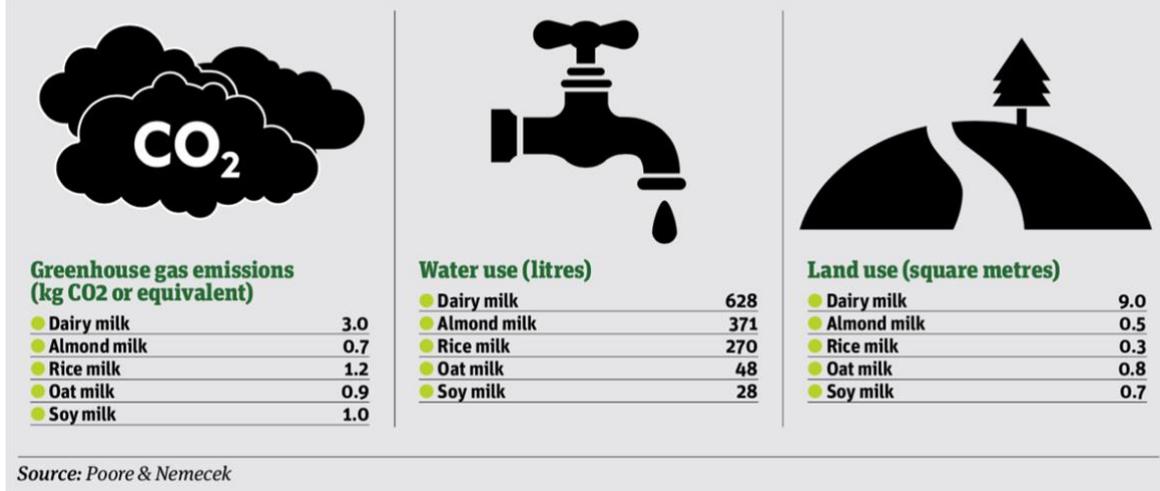


Figure 5: Environmental Footprint of Milk and PBDA (Brown, 2019)

While the plant-based dairy alternatives described previously can therefore be produced in a more environmentally friendly manner than cow's milk, they also offer several nutritional advantages. Besides an average lower calorie and fat content than cow's milk, most plant-based dairy alternatives are also characterized by a lower sugar content as well as a higher calcium content (Ferreira, 2019). With their special nutritional values, PBDA thus appeal not only to people with special health needs, but also to the so-called 'dairy-free curious' – a target group that "typically purchases dairy products but is also seeking dairy-free options ... without having to compromise on taste and texture", and pays particular attention to product quality and trustworthy brands (Canning, 2020, n.p.). However, as most PBDA products are lower in protein than the comparable dairy product (Ferreira, 2019), it is concluded that the decision for dairy or PBDA depends on the specific, individual demands on a product.

This comparative assessment of cow's milk and PBDA in terms of sustainability and nutritional benefits illustrates consumers' motivation to often pay more than twice the price for PBDA as for regular dairy products, as shown in a report by MarketWatch (Settembre, 2021). In the midst of these developments and changes, incumbent dairy companies are thus facing increased competition with companies producing PBDA due to the fact that "the recent surge of market share of the plant-based non-dairy alternatives into the beverage industry has seriously dampened the prospect of steady growth of the traditional milk and dairy industry" (Park, 2021, p.1). The pressure that substitutes exert on the market for conventional dairy products is therefore immense and should not be underestimated.

4.1.5 The Threat of New Entry

Companies wishing to enter any form of food industry are often confronted with comprehensive laws and regulations that range from food safety interventions (Ruegg, 2003) to regulations regarding the packaging of dairy products and marketing standards (European Commission, 2021) to federal and state-controlled price-setting processes (Blank, 1985). Among others, the multitude of these regulations is assumed to be one of the main reasons why the threat of new entry remains small. Other reasons for the rather small scope of new entry into the dairy market were discussed in a study, showing that new entrants to the market would face "considerable challenge[s] in managing the efficiency of milk collection and related logistics" (Ncube, Nkhonjera & Paremoer, 2016, p.78), which, according to the authors, could have a significant impact on the cost of operations. Furthermore, new market entry is constrained by increasing competition in the market due to the "absence of alternative sources of supply" (Ncube, Nkhonjera & Paremoer, 2016, p.78) as a non-separable part of the dairy value chain.

A review of the participating companies at the first Global Dairy Tech Start-up Spotlight event in October 2020 exemplifies the focus of new market entrants in the dairy sector. None of the companies are themselves involved in milk production or milk processing, which illustrates that the barriers to entry into these areas of the value chain are powerful. Instead, of the ten participating companies, 50% offer robotic or computer-based products or services designed to increase the efficiency of either animal farming or the analysis of the produced cow milk (Cooley, 2020). Three companies provide software or cloud-based solutions designed to optimise business planning and processes related to the care for dairy cattle (Cooley, 2020). Of the remaining two companies, one proposes an alternative, artificially produced feed for the livestock, while the other supplies the equipment to detect certain diseases in the herd more quickly (Cooley, 2020). Jeffrey Bewley, analytics and innovation scientist at Holstein Association USA and one of the panel experts at the event, summarises that the companies that will succeed in the dairy industry are those that "are always adopting and looking for new opportunities. If [they] are not moving forward, [they] are falling behind" (2020, cited in Cooley, 2020, n.p.). This indicates that the threat of new entry becomes relatively marginal compared to the importance of own innovation.

Based on this industry analysis, the dairy industry can conclusively be described as highly competitive, demanding different operational actions and strategic adjustments from the companies operating in this industry. To remain competitive, these companies should, and do, focus on innovation. As the mindset shift of consumers towards a more sustainable lifestyle is the root of many of the challenges for dairy producing and processing companies, consumers with their direct or indirect influence are put in the focus of innovation. Despite the presence of innovation in the market, mainly in the form of new products, new tastes or organic product variants (Špička, 2013), the growth rate of the traditional dairy product sector is declining (Wunsch, 2020b). This is reinforced, among other things, by the fact that the PBDA segment cannot be considered as a parallel market to the dairy market, but rather as a rapidly growing segment within this market, thereby significantly impacting the market share of incumbent dairy companies.

The importance of innovation, the growing number of substitute products and the pressure emanating from these, as well as the slow if not declining growth of the market are characteristics that make the dairy industry an interesting case for a mature industry, considering Frost's (1983) description. Following this analysis of the dairy industry, trends, and the related PBDA segment developments, the relevant findings from the primary data derived from ten semi-structured interviews will be presented.

4.2 Factors Influencing Innovation Strategies

As outlined in Chapter 2, the elements influencing incumbent innovation strategies can be divided into industry-level and firm-level factors. The following section presents the empirical findings on industry-level factors, derived from the semi-structured interviews, and analytically relates these to the existing literature.

4.2.1 Industry-Level Factors Influencing Innovation Strategies

Industry-level factors are connected to the economic environment companies operate in and concern the elements that influence innovation strategies externally. The order of the factors does not represent their respective importance.

4.2.1.1 Industry Lifecycle Stage

Generally, the relevance of the industry lifecycle stage for innovation projects was mirrored by interviewee statements when considering the dynamics of activities that are typical for the maturity stage. Claire (Dairy Expert 3) explained that "... there is a limited number of products that you can launch.". This confirms Frost's (1983) descriptions that innovation activity in the mature stage of an industry is generally shaped by limited introduction of new products and a low degree of differentiation. An additional aspect was highlighted by Jakob (Plant-Based Expert 1), who explained that due to the long-established value chain of the traditional meat industry, comparable to the dairy industry, the productivity and efficiency of such value chain is significantly higher than the value chain of meat alternatives, or PBDA. "Meat is cheaper than vegan alternatives, because the value chain has been optimized and made more efficient since centuries.", he claimed. He emphasized that "the plant-based value chain is not at all mature or perfected", and "... all the commodity flows are not established fully yet.", given the major growth steps the plant-based alternatives are currently taking.

Overall, interviewees showed agreement on the fact that cost reduction and increased efficiency are focal goals of dairy producers. One interviewee explained this by stating "... most of the organizations are trying to optimize the input of the dairy milk...", indicating that therefore, enterprises focus on maximization of milk and its processing into final products for their consumers. (Albert, Industry Participant 2). In addition, interviewee statements from all categories were aligned on the fact that the dairy market shows slow growth, if not stagnation, which supports the results of the industry analysis in Chapter 4.1.

4.2.1.2 Competitive Environment

"The plant-based movement creates a lot of pressure, obviously. Because it's coming and it's growing, and it will continue to grow." (Matthieu, Dairy Expert 1)

Related to the industry lifecycle stage is the competitive environment, which is partially shaped by the respective stage within the lifecycle since it commonly changes as the industry develops. There was a high degree of homogeneity in interviewees' views on the competitive environment they operate in. All interviewees described the competitive environment to be shaped by a significantly high degree of competition and high pressure. Statements included

“... it is a very highly competitive business ...” (Matthieu, Dairy Expert 1), “there's so much competition” (Nicole, Industry Participant 3), and “... high competition, we see a lot of companies entering and changing the market.” (Isabel, Industry Participant 4), to mention a few.

As for pressure, several interviewees emphasized the pressure in the market to be related to the increasing growth of PBDA, with statements such as “... taking the long-term thinking, it's really worth it, because only with our dairy brands, we will not make it.” (Nicole, Industry Participant 3) and “It's all about innovation; if we don't innovate, we won't survive. Because obviously there's a sharing of market share ...” (Samuel, Plant-Based Expert 2). Pressure was also related to companies' need for profitability due to a stagnation or decline in product sales or the profitability pressure coming from the supply chain, as explained by Albert (Industry Participant 2). This was supported by Isabel (Industry Participant 4), outlining “if you're not operating also for the plant-based alternative, that means you will start to lose, probably also your profitability is going to diminish.”. Further, there was agreement across all interviewee categories that the dairy industry is a ‘low margin business’, causing additional pressure to stay profitable. These empirical results related to the competitive environment are reflected in the industry analysis in Chapter 4.1, which revealed a high degree of competition among competitors in the industry, as well as in Gilbert and Strebel's (1987) indications of price competition in mature markets. Generally, no differences could be found in statements of representatives whose main business focuses on dairy production or processing, and the companies whose focus is a different one. However, when comparing the interviewee categories, one can detect a tendency of industry participants highlighting pressure to be related to profit and growth as the main area of concern, whereas plant-based experts and dairy experts rather related pressure to their firm's general relevance and existence in the market.

4.2.1.3 Consumers and Trends

“The consumer is very much at the heart of the decision of innovation.”

(Matthieu, Dairy Expert 1)

Among the factors influencing innovation strategies, ‘consumers and trends’ was the most mentioned factor across all interviewee categories. Consumers were highlighted to be not only

the major drivers and sources of innovation, but also the centre of attention in company's strategic considerations. Trends, as the symptomatic effect of consumer preferences, were hence considered similarly important drivers for innovation.

Related to the consumer element, interviewee statements included "... for us, the consumer comes first." (Michael, Industry Participant 1), "We need to really have something great that people obviously want." (Greta, Industry Consultant 1), "we need to provide the consumers with what they would like." (Claire, Dairy Expert 3). There was high congruence among interviewees that consumers build the foundation for their innovation strategies, and the general direction firms should take to secure their competitive position in the market. Interviewees highlighted the importance of consumer insights for innovation strategy success (Isabel, Industry Participant 4). More specifically, interviewees stated that "Knowing the problem in the market is a big driver [for innovation]; if you don't know what the problem is, you're going to create a product that nobody wants." (Samuel, Plant-based Expert 2), and "We're doing a lot of consumer studies, and we have trend frameworks that we're following, in order to deliver the right type of products." (Claire, Dairy Expert 3). In addition, Karl (Dairy Expert 2) shared that today's consumers tend to generally be more curious and open to explore new products than ever before. Besides, consumer needs in the plant-based segment were described to be differing from the needs of dairy consumers (Nicole, Industry Participant 3). In parallel to the discussions on the continuous growth of PBDA, several interviewees still predict the dairy segment to remain large for the upcoming years based on their experience.

"... people will never, ever, ever go all plant-based. Dairy will always be there. It's not going anywhere." (Samuel, Plant-based Expert 2)

This aspect can be attributed to Penning's (2009) study, which revealed that consumers often adhere to known products they relate to good experiences, consequently reducing their innovation adoption rate.

Related to these consumer preferences, research confirms interviewees' opinions that in order to stay competitive, particularly in FMCG industries, companies need to engage in continuous innovation (Audretsch, 1995). Claire (Dairy Expert 3) emphasized the high importance and simultaneous difficulty to predict consumer preferences, stating:

“... there are a lot of consumers who are flexitarian; on Monday they drink oat drinks, Tuesdays they drink soy, and then on Wednesday, they drink milk and on Thursday, they mix them all together. So consumers, they are changing their behaviour.”

This challenge is supported by Von Hippel's (1986) description of the difficulty in defining consumer needs in the consumer goods industry, as consumers change and are therefore inconsistent in their perceptions of products. According to several interviewees, the flexitarian diet has additionally gained traction in the past years. This increasing rise of flexitarian diets indicated by interviewees was also evident in the industry analysis (Bizzozero, 2019, n.p.). In general, research revealed that consumer influence on innovation activity varies between industries (Harrison & Kjellberg, 2016). Given the high number of statements from primary data emphasizing the utmost importance of consumer-centric innovation strategies, it can be assumed that the dairy industry is subject to a high degree of consumer influence.

When it comes to trends, the high relevance of the plant-based trend in the context of the dairy industry was emphasized by all interviewees. Some interviewees described the plant-based trend to be an emergent trend that is 'a consumer need' (Isabel, Industry Participant 4). Isabel (Industry Participant 4) reasoned this statement by mentioning the growing number of allergies among people, such as lactose or milk sugar, which further drive the consumer needs for PBDA. Additionally, interviewees reported that based on their experience, consumers have developed a greater awareness towards health benefits of products, environmental sustainability considerations and animal welfare. Jakob (Plant-based Expert 1) related this awareness to the major influence of the Covid-19 pandemic, leading to the fact that "... consumers had a lot of time to deal with nutrition and health, so the market grew disproportionately, around 68-69%, and this is not a market that ... exists since yesterday.". Other interviewees considered it to be inherent in the generally growing awareness for environmental sustainability (Michael, Industry Participant 1; Samuel, Plant-Based Expert 2; Matthieu, Dairy Expert 1), partly increased due to movements such as 'Friday's for Future' (Jakob, Plant-Based Expert 1). This development may be explained by Kim & Penning's (2009) argument that consumer education can enhance the adoption rates of innovations, particularly if products are promoted by well-known ambassadors and address relevant issues. To become agile towards such trends, "... the good companies pay attention to how their cohort is progressing; ... to see an evolution, it's better to put the innovation ahead of that change."

(Albert, Industry Participant 2). Overall, interviewees from the industry participant category were widely aware of current trends and insights, while dairy experts rather highlighted challenges arising from the PBDA trends.

Summarily, the trends mentioned by the interviewees reflect the trends detected in the industry analysis, which showed the same emergent patterns and consumer needs as reflected in trend studies of the FMCG industry. Furthermore, given interviewees' predictions on the further growth of the PBDA segment, supported by the industry analysis and Audretsch's (1995) findings, it can be assumed that the firms producing PBDA as new entrants into the dairy industry will be growing further in the future to a significant extent.

4.2.1.4 Environmental Regulations

“I don't think the political environment [has a big impact], apart from [the fact] that [plant-based] is promoted very much positively”. (Karl, Dairy Expert 2)

Environmental regulations were addressed to a limited extent by interviewees. Karl (Dairy Expert 2) explained that political regulations affect the dairy industry in different ways. In the further past, subsidies for dairy farmers provided by governments supported the inclusion of milk into the population's diet. He further stated that this aspect has recently shifted towards the aim to increase the plant-based share in people's nutrition, yet he considered the impact to be relatively limited on dairy companies. This aspect is advocated in related literature (Jaumotte & Pain, 2005; Pavitt & Walker, 1976; Rothwell & Zegveld, 1988) including the claim that governmental policies should support innovative actions. Other interviewees' views differed from this assessment, claiming that government actions do particularly affect the PBDA segment, as recent policies have prohibited PBDA to have similar names as dairy products (Jakob, Plant-Based Expert 1; Samuel, Plant-Based Expert 2). This hindering factor is reflected in Ramanathan's (2010) evidence that regulations might as well encumber innovative activity and therefore need to be monitored and addressed.

This discrepancy of interviewees' viewpoints can be detected in literature as well, where findings showed that governmental regulations may have an influence on innovation success (Jaumotte & Pain, 2005; Lim & Prakash, 2014; Pavitt & Walker, 1976; Ramanathan et al.,

2010; Rothwell & Zegveld, 1988), or may not have an influence at all (Aras, Aybars & Kutlu, 2010; Borsatto & Amui, 2019; Brammer, Brooks & Pavelin, 2006; Trevlopoulos et al., 2021; Netherlands Ministry of Economic Affairs, 1972 cited in Ashford & Heaton, 1976; Chase Econometrics Associates, Inc., 1972 cited in Ashford & Heaton, 1976). Additionally, discrepant views of interviewees might be related to the particular regulation they are faced with, considering the differing degree of flexibility the respective regulation allows, as argued by Ramanathan et al. (2017), and Ramanathan, Ramanathan & Bentley (2018). One interviewee mentioned that the geographic location the company operates in also determines the success of innovation (Matthieu, Dairy Expert 1). He stated that the degree and type of regulation greatly varies across the world, which is supported by Albert (Industry Participant 2) who explained that “both dairy and plant are very local businesses ...”. It can thus be assumed that the degree and direction of influence regulatory aspects exert on firms’ strategic innovation activities differs, depending on whether the respective firm operates on a global or on a local level, which is supported by Borsatto and Amui (2019).

Interviewees’ views on environmental regulations varied not in a contradictory manner, yet in the aspects they deemed particularly relevant for their operations. No significant differences or similarities among categories could therefore be identified.

4.2.2 Firm-Level Factors Influencing Innovation Strategies

Firm-level factors are connected to the aspects that characterize the firm internally and thus can be influenced by it. These factors include the firm’s internal strengths and weaknesses, its strategic intent, its assets and resources, its innovation process design, its ownership structure, organizational culture, and leadership, as well as its path dependency. The order of the factors does not represent their respective importance.

4.2.2.1 Internal Strengths and Weaknesses

Interviewing the participants of the study on current and potential innovation projects revealed the importance of firm-specific strengths and weaknesses as factors influencing these projects. Based on the interview statements, it can be assumed that company’s strengths and weaknesses can influence innovation success directly and indirectly. Considering the viewpoints on direct influence, many interviewees stressed the importance of constantly developing new, and enhancing existing competences to build strengths that allow for innovation, since strengths

and weaknesses determine the success of innovation (Isabel, Industry Participant 4). Other statements included:

“we need to grow and build new competencies” (Claire, Dairy Expert 3)
and “... build strengths that allow you to innovate” (Jakob, Plant-based Expert 1)

Further, it was stated that strengths and weaknesses themselves should be adjusted and calibrated to adapt to global or regional requirements (Albert, Industry Participant 2). Some interviewees reported that the companies they work for “know where [they] have [their] strength[s]” (Nicole, Industry Participant 3) or moreover believe they already have “... the right skills and capabilities to really serve consumers ...” (Albert, Industry Participant 2), and have more beneficial knowledge of their product category and the appropriate capabilities to innovate than many others (Karl, Dairy Expert 2). Karl (Dairy Expert 2) further added the importance of “being aware of your weaknesses, for example, the environmental footprint”. The expressed relevance of the development of existing or new strengths aligns with theoretical arguments, claiming that this influences the success of innovation (Markides, 1997).

Besides the direct influence of a company’s strengths and weaknesses on innovation, the indirect effect is considered as the strengths’ direct relation with the firm’s competitive advantage and the facilitation of innovation that results from this advantage. An example illustrating this relation was stated by Albert (Industry Participant 2), claiming that “the level of flexibility, [that] really is a competitive advantage”, which allows to better address consumer needs. Another strength mentioned as an example for an innovation-supporting factor is the history of the considered company “which is a big advantage” (Karl, Dairy Expert 2). The presence of in-house expertise “from laborers to nutrition research ... to product developers in-house” (Samuel, Plant-based Expert 2) presents another strength, which, in comparison to the beforementioned examples, provides a conditional advantage for innovation, as it is, in this context, mainly beneficial when innovation is handled entirely internally. It can thus be said that the strengths and weaknesses not only influence the intention to innovate but also its direction. This aligns with findings from the literature review which suggest that the type of innovation is dependent on the firm-specific strengths and weaknesses (Markides, 1997).

The concentration of the presented statements shows that the understanding for the relevance of being aware of the firm's strength and weaknesses for formulating innovation strategy is mainly prevalent among the representatives of companies producing and/ or processing dairy. The fact that plant-based experts showed only limited awareness of the significance of strengths and weaknesses for innovation strategy does not necessarily lead to the conclusion that this factor is less important. Summarising, the findings of the study and their strong correlation to theory, Schilling's (2017) claim that internal strengths and weaknesses play a vital role regarding innovation strategy formulation is supported. In addition, however, it is noted that the reviewed impact appears rather indirect, via the competitive advantage, than direct.

4.2.2.2 Strategic Intent

According to the statements collected during the interviews the strategic intent of the companies differs significantly, depending on the different market segments they operate in and their ownership structure. However, the consensus emerging from primary data is that the strategic intent of a firm is crucial when formulating an innovation strategy. This is supported by several statements when interviewees were asked to rank factors presented in the preliminary framework based on their perceived relevance, such as "there always needs to be a strategic intent" (Jakob, Plant-Based Expert 1), "number three is the strategic intent" (Albert, Industry Participant 2), "definitely the strategic intent" (Claire, Dairy Expert 3) and "innovation plays an important role, because otherwise, you cannot survive in today's world" (Isabel, Industry Participant 4). Further claims allow for the assumption, that the strategic intent itself can enable innovation, which is derived from answers to the questions of what strategy means to the interviewees or in which way innovation is incorporated in the firm's strategy. Interviewees responded to these questions quite distinct, stating that "it's all about innovation" (Samuel, Plant-Based Expert 2) and that it is "part of our vision to create the future of dairy which to me translates into innovation" (Claire, Dairy Expert 3). The role of the strategic intent for innovation can be concluded by the statement that

"... strategy is really to see the pressure

Typically this pushes us to innovation" (Albert, Industry Participant 2).

Applying the theoretical definition of 'strategic intent' in literature, according to which it can be understood as a long-term goal for the organization (Hamel & Prahalad, 1989), the inclusion

of innovation in the strategic intent would compare to innovation being one of the corporate's main goals. Derived from this, the strategic intent can have a positive influence on innovation projects, provided that innovation is embedded in the strategic mission of a company.

Insights from the literature review furthermore point out that a company's strategic intent is expected to influence innovation strategies also regarding the economic and ecological mindset it creates, which in turn impacts the attitude towards or against innovation. Interviewee statements entailed that this mindset in case of incumbents is often profit-driven, which commonly leads to rather incremental instead of radical innovation (Diekhof & Cantner, 2017). This profit-driven intention is supported by several interviewees that revealed that "profitability is also important" (Jakob, Plant-based Expert 1), and one "also need[s] to look at the profitability" and that there are "high expectations on the margins" (Albert, Industry Participant 2). Questions such as "How can I increase profitability?" (Albert, Industry Participant 2) therefore steer the companies' operations. While these insights on the one hand tend to lead to the derivation that the strategic intent might also represent a hindering factor for innovation other than incremental innovation, other interviewees' opinions elucidated that the importance of being profitable can also trigger innovation. Karl (Dairy Expert 2) for example stated that "we want to secure the highest possible milk price to our farmers" when asked for drivers of innovation. Claire (Dairy Expert 3) additionally claimed that "[we] also have a mission ... to secure the highest value for our farmers ..., including innovation". Concluding, from an operational perspective, profitability seems to have a significant influence on innovation strategy.

While academic literature additionally suggests an interrelation between the strategic intent and the management style (Hamel & Prahalad, 1989), the primary data of this study does not provide any evidence for such a relation. This stems from an analysis of codes used to describe statements about the strategic intent and the leadership style, which were not mentioned in correlation in any interview.

Given the fact that the impact of a company's strategic intent on innovation and innovation strategy was considered from both interviewees working in non-cooperative and cooperative firms, it can be concluded that strategic intent is crucial for companies of both types of ownership. For cooperatives, the researchers assume that the strategic intent – to secure

maximum profitability for the farmers, respectively the owners – drives innovation. In contrast, from the perspective of non-cooperative representatives, the profit-motive can potentially be hindering innovation projects that go beyond incremental, process-focused innovation.

4.2.2.3 Asset and Resource Base

Primary data insinuated that the availability of assets has a certain impact on innovation, considering that financial assets can deliver important resources necessary to innovate. Statements such as “they switched to entirely plant-based because they have the money” (Greta, Industry Consultant 1) initially pointed towards this, but the relevance of an appropriate asset base became even more evident through comments on how an innovation of dairy companies towards the production of PBDA can be hampered by an insufficient asset base. “The biggest problem [is] that it’s much more expensive” (Nicole, Industry Participant 3), the “require[ment of] capital expenditure” (Matthieu, Dairy Expert 1) and “you also need to be willing to invest in good ideas” (Michael, Industry Participant 1) are claims that support the impact of assets on the development of innovation. However, compared to other influencing factors, assets, and their characteristics such as their specificity were mentioned marginally by the interviewees.

Incorporating secondary data to enrich the primary data collected, an analysis of the most recent balance sheets of five of the largest dairy processing companies in the world (Nestle, Danone, FrieslandCampina, Arla & Fonterra) shows that the equity ratio is consistently below 50% and specifically ranges from 36.0% to 43.79% with an average value of 38.04% (Arla, 2021; Danone, 2020; Fonterra, 2021; FrieslandCampina, 2021; Nestlé, 2020). This indicates that the companies are generally considered as leveraged companies and tend to operate debt-financed (Corporate Finance Institute, 2021). Taking into account the in Chapter 2.2.2.3 described relationship between the types of financing of investments, the asset specificity and the strategic advantage with regard to innovation, two aspects can be concluded: on the one hand, the leading companies in the dairy processing industry have a rather low asset specificity, which indicates a possible use of such resources for purposes other than the current one (IGI Global, 2021). On the other hand, particularly product innovations often build on the company’s specific knowledge base, indicating a high asset specificity (Santarelli, 1991), which could, based on the previous analysis, be considered a disadvantage in the case of the dairy processing companies studied.

For incumbent dairy processing companies as companies operating in mature markets, the entry into the PBDA segment could be interpreted as a type of product innovation. Hence, the absence of an advantage through specific knowledge as a resource is considered as similarly significant as the advantage of the ability to use assets for a novel purpose resulting from a rather low asset specificity. A quote from Michael (Industry Participant 1) clarifies the role of assets and resources besides the necessity for appropriate resources itself, which has been derived from the other interviewees' statements. According to him,

“... the right [resource] allocation ... is quite important”

when approaching innovation. This is supported by the fact that resource allocation of incumbent firms is often “designed to optimize the profitability of the firm's current operations” (Hill & Rothaermel, 2003, p.5). Hence, it is assumed that an adjusted allocation of resources is crucial to transform business operations through innovation.

Summarising the direction of the presented findings regarding the impact of the asset and resource base on innovation strategy formulation, it is noted that the interviewees across all categories seem to agree that the absence of financial resources is more detrimental for innovation than the benefit derived from the availability of other resources. It is therefore assumed that the examination of the available assets and resources is vital for innovation strategy formulation.

4.2.2.4 Innovation Process Design

Interviewing representatives from all categories revealed that the process established to realise innovation differs significantly in its design and the success it promises. However, although these two characteristics were mentioned predominantly when elaborating the innovation processes, no direct correlation between these two can be established based on the findings from interviews. Therefore, first, the findings regarding the specific processes in place will be presented. Second, statements regarding the success of innovation activities emerging through these processes will be outlined.

The interviewees presented a variety of different approaches to address innovation. While some respondents stated that they “take pride in doing everything in-house” (Samuel, Plant-Based

Expert 2), that “launching new products ... is more internally” (Albert, Industry Participant 2), that they “have the capability within the team actually” (Karl, Dairy Expert 2), others explained that they “have a lot of different kinds of collaboration partners” (Claire, Dairy Expert 3) and “had a lot of suppliers that helped develop a process” (Claire, Dairy Expert 3), implement “sessions with those kind of early adopters who can ... bring new perspectives” (Isabel, Industry Participant 4), “do some other design thinking strategies where [they] work together intensely with consumers” (Isabel, Industry Participant 4), or “have used more and more innovation platforms” (Matthieu, Dairy Expert 1). The predominant occurrence of statements emphasizing the importance of collaborative innovation can be summarised by this statement:

“We cannot do it ourselves.” (Claire, Dairy Expert 3).

Besides these forms of in-house and collaborative innovation, some interviewees mentioned M&A as one way to expand current operations without innovating at all, stating that “the shortcut is to buy an existing company” (Albert, Industry Participant 2), and that “that would have been an option and was also an option for us” (Karl, Dairy Expert 2).

The described findings align only partially with what theory suggests. While Roper et al. (2008) found that diversified knowledge sourcing positively influences corporate innovation, the primary data collected does not necessarily allow for the same derivation, considering the fact that also the companies that solely rely on internal sources of input innovate successfully. Similarly ambivalent is the alignment of the interviewees’ statements with the theoretical standpoint of Hartwich and Negro (2010). According to the authors, a collaborative design of the innovation process is especially relevant for innovation as a whole. On the one hand, this goes along with what the interviewees revealed regarding their companies’ innovation approaches. On the other hand, again, also the companies that design their innovation exclusively internally are successful in doing so and, even more, sparked pride about this “we take pride in doing everything in-house” (Karl, Dairy Expert 2). In this context, the statements of some interviewees further disagree with Schweisfurth (2017), who found that ideas contributed by external sources tend to be of a higher value than internal contributions.

What appeared consistent across the responses of the interviewees whose companies included forms of cooperation in their innovation processes, is the implementation of the stage-gate

concept in the internal process. Statements also hinted towards the fact that teams with a diverse background are eagerly used to exploit the potential of innovation processes (Claire, Dairy Expert 3), which is supported by interviewee Isabel (Industry Participant 4), stating that they “bring agile teams together, having the background[s] from technology, customer insights, ingredients, and also ... people from marketing ... to innovate, test and bring up new value propositions”.

Besides the mentioned specifics of the innovation process, many interviewees’ answers align with each other by emphasizing that there are often several innovation projects running in parallel, which is said to have a major impact on the time frame of innovation. This, thought ahead, leads to the assumption that the time-to-market of a new idea should be considered when formulating an innovation strategy. This is derived from claims as “there are so many innovation projects, so you wouldn’t believe that companies innovate so slow, but we have ... hundreds of different innovation projects” (Isabel, Industry Participant 4), “it was a classical innovation pipeline” (Michael, Industry Participant 1) and “it’s almost a long-term effort in a short-term, changing environment so you have to readjust” (Matthieu, Dairy Expert 1).

According to the findings derived from literature, the implementation of a stage-gate process influences the ratio of in-house innovation compared to innovation resulting from collaboration. However, as collaborations and partnerships are highly relevant contributors to the success of innovation (Hartwich & Negro, 2010), it is derived that against the background that stage-gate processes tend to hinder the effectiveness of collaborative innovation, special efforts should be devoted to engage in partnerships and forms of open innovation.

As mentioned before, the differing approaches for innovation were expected to have a certain influence on the success of innovation. This was confirmed only partially by primary data as no clear relationship of this was directly stated by the interviewees; instead, rather opposing statements were collected. For example, Jakob (Plant-Based Expert 1) claimed that “companies which don’t necessarily have a process in place ... still come up with a product and do things as they go”. He concluded that the innovation process design therefore has “probably no” influence at innovation strategies at all. On the other hand, incorporating partnerships in the process of innovation was declared as “help[ing] us to discover opportunities” (Albert, Industry Participant 2). However, the same interviewee stated that “it should be a black box for

everybody else except us” (Albert, Industry Participant 2), which presents a two-fold attitude towards collaborative innovation. Matthieu’s (Dairy Expert 1) statement that they “used more and more open innovation platforms ... trying to accelerate innovation – but with limited success” underlines this discord. The assumption that the design of innovation processes has only a limited effect on innovation strategy and outcomes is further supported by the fact that the factor ‘Innovation Process Design’ has not been mentioned a single time when the interviewees were requested to point out the most important influencing evaluating the preliminary framework presented to them. The occurrence of contradictory statements within a single interview, such as “we have a lot of partnerships” and “typically we don’t share ideas”, both mentioned by Albert (Industry Participant 2), additionally stresses this hypothesis.

In conclusion, it is assumed that the impact of the past and current innovation process design on future innovation strategies is the one most contradictory communicated by the interviewees – across the different categories of participants, as well as within the single categories. While some interviewees representing a dairy cooperative stated that collaborative approaches of innovation are quite beneficial, another interviewee of a dairy cooperative emphasized the challenges arising through innovation collaborations. The same contradiction is found when comparing statements from interviewees working for non-cooperatives. It is therefore concluded that the impact of the innovation process design varies among companies and depends on factors that need to be elaborated further.

4.2.2.5 Ownership Structure, Leadership and Organizational Culture

The ownership structure, the leadership and the organizational culture are factors that, according to the review of literature, were expected to have an impact on innovation strategy. This can be confirmed by the insights gained during the interviews, which highlighted that the ownership structure, culture and leadership need to be in sync with each other when it comes to innovation strategy formulation. Mostly, however, particularly the influence of the ownership structure became apparent through manifold statements that indirectly addressed its influence on innovation. The specific ownership structure of cooperatives and its consequences were predominantly emphasized by claims such as “if we have a global Co Op, like Arla and Campina and Fonterra, for them innovation is very, very hard” (Albert, Industry Participant 2), “because we are a democracy as well as owned by dairy farm, [it has] taken us a lot of efforts [to innovate]” (Karl, Dairy Expert 2), “... we are a cooperative ..., therefore, [a] move in that

direction will require a lot of political, internal discussions” (Karl, Dairy Expert 2), “a Co Op as it is by itself is a very democratic organization . . . , so that creates a heavy process that is not very fast, and certainly not fast-moving” (Matthieu, Dairy Expert 1), “the decisional process [in a cooperative] is long, and it’s complex. And it creates an enduring effect, more than it’s helping and supporting” (Matthieu, Dairy Expert 1) or “simply the nature of the Co Op” (Matthieu, Dairy Expert 1), answering the question what hindered the according interviewee’s company to innovate so far.

Summarising, the special ownership structure of cooperatives leads to more complex and time-consuming decision processes, especially in the context of innovation. This impact seems to be so strong that it even influences the subjective perception of this ownership type, derived from a statement by interviewee (Samuel, Plant-Based Expert 2), that implies a personal judgement: “Luckily, we are a privately owned company”. A striking quote from an interviewee that evaluates the implications of a cooperative ownership from an outside perspective shed light on a very humane reason for the rather hindering effect of cooperative ownership in the dairy industry on innovation away from dairy-only production:

“Milk is like blood for them.” (Michael, Industry Participant 1).

Academic literature has suggested that long routines and processes indirectly lead to a limited degree of engagement in innovation activities (Hill & Rothaermel, 2003). Combining this finding with the outcomes of the interviews presented leads to the conclusion that the ownership structure has a significant impact on the effectiveness and efficiency of innovation through the way ownership influences internal processes. The authors highlight that this applies especially for firms operating in a relatively stable environment. Based on these aspects, it is assumed that the disruption of a seemingly stable market as the dairy industry caused by external factors might lead to a relative disadvantage for these companies, as they seemingly lack potential dynamics to adapt to changing circumstances, which is referred to as ‘absorptive capacity’ (Hill & Rothaermel, 2003).

Statements as “everybody would like to innovate” (Isabel, Industry Participant 4) and “everybody puts innovation very high on their list” (Matthieu, Dairy Expert 1) put emphasis on the general willingness to innovate. However, findings from the interviews also reveal that

it is not only the ownership structure that enables or hinders innovation, but also leadership. Comments as “leadership needs to decide to invest” (Jakob, Plant-Based Expert 1), “promote it to the senior stakeholders to be able to gain support” (Isabel, Industry Participant 4), “based on my experience, what’s most important is the leadership and the framework [it] puts for success” (Isabel, Industry Participant 4), “leadership needs to empower ... people” (Isabel, Industry Participant 4) deliver the base for that derivation. Michael (Industry Participant 1) further adds that “you need to be open to your business model and ... to product concept tests. This is a quite important attitude, which needs to be driven by the leadership team” and “your leadership team should be very demanding when it comes to innovations”. This is supported by literature, claiming that executives’ attitudes have a high impact on corporate innovation (Bruno, 2011). Therefore, leadership should be considered particularly in the context of innovation strategy development. The finding of Barsh et al. (2008) according to which a vast majority of senior executives are “rather disappointed in their ability to stimulate innovation” (p.38), further illustrates the critical importance of leadership, summarized in the statement:

“The leadership and how the leadership sets the framework for success ... is pretty important.” (Isabel, Industry Participant 4).

The ownership structure and the leadership style are strongly interwoven with the organizational culture. That the organizational culture itself also has an impact on innovation strategy formulation is supported by claims as “you need engagement and enthusiasm and belief ... to be successful with innovations” (Michael, Industry Participant 1), “you need to create that momentum within the organization” (Michael, Industry Participant 1), “you should have a culture where failing is always okay as long as you learn from it” (Michael, Industry Participant 1).

In comparison with, for example, the influence of the strategic intent on innovation strategy, the influence of the ownership structure was highlighted significantly more often by the interviewees that represented cooperatives than by other interviewees. Cooperative representatives mostly agreed on the hindering impact of the cooperative ownership structure for innovation activity, which was supported by several interviewees of non-cooperatives. This leads to the conclusion that the ownership structure has a particularly remarkable impact on innovation strategy and strategy in general. Interviewees did consider leadership and the

organizational to be influential on innovation strategy, however, these factors were mentioned notably less than the factor ‘ownership structure’ during interviews.

4.2.2.6 Path Dependency

Based on the review of according literature, path dependency describes the phenomenon when “present strategic activity is induced by its past” (Thietart, 2015, p.12). Based on the interviews, path dependency seems to have a moderate influence on innovation strategy compared to other factors. One interviewee stated that “lots of ongoing and future operations are dependent [on] what happened in the past” (Albert, Industry Participant 2) and that “approval of potential innovation projects is highly dependent” (Albert, Industry Participant 2). The implications of these declarations can be clarified by the statements of other interviewees. Among others, statements included: “[we] look at past, failed projects ... to learn what went wrong” (Claire, Dairy Expert 3), “[a past innovation project] has given us a lot of learning and created enough courage to move further” (Karl, Dairy Expert 2), and “this is really where we also use our experience from the past years” (Nicole, Industry Participant 3). It is therefrom derived that the dependence of innovation decisions on past operation benefits the companies, as the learning effects were particularly emphasized. However, the researchers note that this dependence seems to occur rather organically and is only seldomly induced deliberately. Only one example was mentioned that might have led to the opposite assumption, which was given by Isabel (Industry Participant 4) stating that they “do a post-mortem of the project, when it's closed or failed, ... to analyse what went well, what didn't go well, what are our learnings ...”. Still, it was also claimed that

*“You’ve got to know what’s happening or
what has been done already to improve it” (Samuel, Plant-Based Expert 2).*

This attributes to the necessity of considering ‘path dependency’ as an influencing factor when formulating innovation strategies. Its influence is, nevertheless, moderated by the in fact rather unintended, unconscious learning effect derived from past operations, which is deduced from the observation that path dependency as such seemed to be a quite unpopular concept across most interviewees. The fact that there is only moderate awareness for the influence of past operations on future innovation leads to the assumption that the concept of path dependency can only be considered marginally when formulating innovation strategies. On the one hand,

the attempt to learn from past events seems to be related to path dependent behaviour. On the other hand, however, Thietart (2015) stresses that there is a “need to be far more modest in relating choice to consequences” (p.30), such as to learnings from the past. Therefore, given the alignment of the empirical findings with statements from academic literature, it can be derived that the impact of path dependency on innovation strategy formulation depends on the degree and the way that past actions and results are used to derive further strategic recommendations.

4.2.2.7 Timing

Timing as a factor influencing innovation strategies was claimed relevant by interviewees as a determinant of market success. However, interviewees’ statements varied concerning the underlying reason for the importance of timing. One interviewee highlighted that timing is important in relation to the time needed from the initial idea to the eventual launch of a product on the market (Albert, Industry Participant 2). Since the PBDA segment has been developing since several years, dairy companies expanding into this segment will not benefit from a first mover advantage; however, they may profit from observing their competitors’ strategies (Katila & Chen, 2008). Other interviewees described the internal process from the initial idea to the final product as lengthy, frequently leading to the issue that a company might miss a trend simply due to the long time it took for it to develop a product matching such trend (Nicole, Industry Participant 3; Claire, Dairy Expert 3). Related to this issue of lengthy decisional processes, one interviewee explained that particularly in cooperative ownership structures that are commonly owned by farmers, the time from the proposal of a strategic innovation to the final approval is often very long, since the owners need to validate every decision, stating: “... it’s in the DNA of the [cooperative] organization ...”. That decisional process is long and complex. And it creates an enduring effect, more than it's helping or supporting.” (Matthieu, Dairy Expert 1). Supporting this attribution of the ownership structure being the reason for complexity, Jakob (Plant-Based Expert 1) outlined that in his view, there are major processual differences between cooperatively owned companies and corporate organizations, stating:

“There is a difference between corporate organizations and owner-operated. Big corporates always take much longer to decide.”

Literature sustains this observation, claiming that the innovation priority is considered lower in cooperative firms than in non-cooperative firms (Brat, Martínez & Ouchene, 2016). In this context, Katila and Chen (2008) indicated that companies' innovations can achieve higher gains from innovating in case their competition lags behind. Based on the interviewee statements on process length and ownership differences, and the related existing research on these matters, it can be assumed that due to the often-smaller size and nimbleness of PBDA producers, these might be able to achieve a competitive advantage due to faster innovation processes in comparison to large corporate organizations or cooperatives.

When comparing the interview categories related to timing, Industry Participants seemed to be more focused on the timespan from an initial idea to the launch of the final product, while Plant-Based Experts rather considered the right timing to launch an innovation, mainly focusing on the competitive environment. Dairy Experts primarily referred to their concerns about the length of their internal decisional processes related to innovation.

4.3 Additional Factors Influencing Innovation Strategy

The foregoing sections presented the factors influencing innovation strategies identified in the literature review, summarised in the preliminary framework. As outlined and analysed above, empirical data showed congruence with these elements to a great extent. Besides the above-mentioned factors, interviews revealed additional factors of influence that had not been detected during the literature review and will therefore be presented in the following. These factors have not been mentioned in the same density as some of the previously described factors. However, it has not been hinted at these factors similarly as to the factors above through the questions posed, they are expected to be notably relevant, although the absolute number of interviewees mentioning them is somewhat smaller.

Supply Chain

The supply chain, or production value chain, was mentioned in relation to different aspects concerning innovation strategies. As marked above, one interviewee considered the PBDA supply chain to be less efficient than the dairy value chain due to PBDA's more recent emergence (Jakob, Plant-based Expert 1). Interviewees across categories showed agreement on the fact that the production of PBDA remains more expensive for companies that have not yet innovated in the PBDA segment, or whose focal business is in the dairy segment or other

segments. Another argument raised by Albert (Industry Participant 2) included that "... because of the supply chain pressure, the innovation is not big in the space ...” and that primarily the dairy organizations need to ensure that their farmers yield sufficient returns through efficiency improvements instead of new product innovation activities. This can be related to Onufrey & Bergek (2020) who claim that often the firms’ primary focus is on leveraging existing resources and capabilities to improve profitability, which might hamper innovation projects concerned with new products in other categories such as PBDA.

Stakeholders

“... we cannot do anything without the retailers.” (Jakob, Plant-based Expert 1)

When considering innovation processes and strategic goals, interviewees explained that various relevant stakeholders need to be considered when making decisions related to innovation. Firstly, the retail as the primary customer was highlighted as an important stakeholder in the innovation process. Jakob (Plant-Based Expert 1) and Claire (Dairy Expert 3) argued that for the innovating company to be able to sell new products, retailers need to list these products in their shelves. Due to the interactive power relationship between producing companies and retailers, this factor plays an important role. Again, consumers were highlighted as highly relevant stakeholders (Matthieu Dairy Expert 1; Nicole, Industry Participant 3), supporting the previously presented findings on consumers and trends. Farmers were declared as a third relevant stakeholder group, not surprisingly however, only by the interviewed Dairy Experts and the Industry Consultant (Greta, Industry Consultant 1). Greta (Industry Consultant 1) reported that in the process of a company that transitions from dairy products to PBDA, the supplying farmers find themselves subject to high risks regarding their existence. Lastly, Samuel (Plant-Based Expert 2) raised the argument that depending on the ownership structure of a company, the stakeholder groups not only vary, but can display differing degrees of hindrance or support: “Luckily, we are a privately owned company. So we don't necessarily have ... stakeholders outside of the company. A lot of decisions are made internally.” Overall, stakeholders appeared in manifold interview statements rather indirectly, when interviewees referred to interest groups that reflected stakeholders but were not directly termed as those.

Market Share

Interviewees revealed that the current market share of the considered company and the potential to gain a larger market share can influence a firm's (innovation) strategy. Jakob (Plant-Based Expert 1) stated that the company he works for is the leader in the market they operate in, yet only has a market share of 3%. His statement that "not all market segments can be entered by us because we have particular attributes consumers associate with us" leads to the assumption that the goal of his employer's operations, including their innovation efforts, might not be to increase market share. Therefrom it can be derived that the impact of market share on innovation in the case of incumbent firms is not of quantitative nature – the less market share, the more innovation – but rather influences the aim of innovation. This derivation, however, does not seem to apply for firms that are relatively new to a market: according to Albert (Industry Participant 2), his employer engages in innovation "to increase [their] market share". In summary, it can be stated that the current market share of a company influences the goals of innovation projects. It is therefore assumed that a consideration of the market share is crucial when formulating an innovation strategy.

Market Cannibalization

"Are we competing our own business?" (Matthieu, Dairy Expert 1)

Market cannibalization describes the decline in sales of a firm's originally offered product by the gain in sales of a new product it introduces (Srinivasan, Ramakrishnan & Grasman, 2005). Analysing the collected data, this phenomenon seems to indeed be relevant in the context of innovation. While Nicole (Industry Participant 3) stated that "if we see [that] the cannibalization would be big, then we probably wouldn't launch it", Matthieu (Dairy Expert 1) emphasized the internal debate resulting from potential market cannibalization, stimulating questions like "Should we get out of that? Or should we competition or own product?", when asked for the reasons why the cooperative he works for has not yet entered the PBDA market segment. Nicole (Industry Participant 3) added that the issue of market cannibalization is also considered by retailers as customers. According to her, retailers often question: "Why are you launching a plant-based product within a very classical dairy brand ...? Don't you cannibalise yourself within that brand?". The awareness of potential market cannibalization leads to the assumption that the resulting economic consequences might be significant. This supports the

conclusion that potential market cannibalization should be considered appropriately when developing innovation strategies to avoid economic disadvantages caused by innovation.

Personal Attachment

The factor of personal attachment is, based on the interviewees' statements, considered from two perspectives. On the one hand it was mentioned that there is a certain degree of "resistance, especially in the production" (Jakob, Plant-based Expert 1), underlined by the statement that "they would never completely move to plant-based because in the end, [company name]'s DNA is the dairy" (Nicole, Industry Participant 3). Also, the impact of personal attachment was highlighted for the case of cooperatives by Greta (Industry Consultant 1), stating that "[the transition towards the PBDA segment] can frighten a lot of farmers". On the other hand, several interviewees stated that the sentiment of pride can shape specific decisions. Samuel (Plant-Based Expert 2) stated that "we take pride in doing everything in-house", Jakob (Plant-Based Expert 1) added that "they are proud of it" and Karl (Dairy Expert 2) explained that not only "the dairy people are very proud and love their products" but that also he himself is "super proud". Both the resistance to new innovation projects, as well as the pride of past activities, suggest that the personal attachment of the people involved in innovation should be not underestimated, since it is expected to significantly influence the acceptance of innovation strategies.

4.4 Revised Framework

The analysis of the empirically collected data shows a high correspondence with existing theory. All factors influencing innovation strategies identified in literature were addressed by the interviewees, which confirms their relevance and thus the theoretical assumptions made prior to the empirical data collection. Yet, besides this confirmation of the identified factors presented in the preliminary framework, primary data revealed additional factors to be important in the context of innovation strategy formulation. Given the focus of this study on mature industries, these additional factors may predominantly be related to such industries and therefore were not particularly detected during literature research. As presented above, the additional factors identified based on empirical data are supply chain, stakeholders, market share, market cannibalization, and personal attachment. Due to their nature, the additional factors were all categorized to be influencing innovation strategies on the firm level. The separate presentation of the factors 'market share' and 'supply chain' is explained by the fact

that they can neither be regarded as solely industry-level nor firm-level influential. Therefore, they are considered in both ways – firm-specific and compared to the competition in the market.

Intriguingly, after completing the primary data collection and relating the empirical data to theory, ‘industry structure’ as a factor became apparent. Only after having gained a holistic perspective which both primary and secondary data allowed the researchers to form, ‘industry structure’ was, similar to ‘timing’, identified as a superordinate influencing factor in the chosen case study for the following reason: the market analysis, supported by the empirical data, revealed the major changes the dairy industry currently undergoes emanating from the PBDA segment developments. These observations and analytical revelations related to the growth of PBDA and the simultaneous decline of the dairy segment, derived from both market analysis and the interviews, may be an indication for a fundamental structural industry change according to Porter (2008). As mentioned in Chapter 2.2.1.1, the structure of an industry may change in consequence of new technologies, changing customer or consumer needs, and other factors. Evidently, the dairy industry shows major changes due to shifting consumer needs and trends as presented in Chapter 4.1, which reflects Porter’s (2008) descriptions of reasons for industry structure changes. Sustained by Gilbert and Strebel’s claim that industries can undergo evolutionary transitions during their lifecycle, it can be concluded that the PBDA segmental growth increasingly influences the dairy industry by taking market share from traditional dairy segments. Hence, like the factor ‘timing’, ‘industry structure’ was added as an overarching factor influencing innovation strategies, as these factors are considered to frame the industry-level and the firm-level factors, as well as the additionally identified factors.

The plus and minus signs attached to each factor display the frequency of mentions during primary data collection; the factors with minus signs were mentioned less often than the ones with a plus sign. This indication does not intend to indicate a weighting of the factors, but solely the number of times these factors were noted by interviewees. The factors ‘ownership structure’ ‘leadership’ and ‘organizational culture’ were regarded separately since the frequency of ‘ownership structure’ was distinctively higher than both leadership and organizational culture. The reason for this absence of a weighting or hierarchy of factors is explained in Chapter 5.3. In summary, the analysis of primary data in relation to existing theoretical concepts allowed for the revision and enhancement of the preliminary conceptual framework based on the underlying empirical findings.

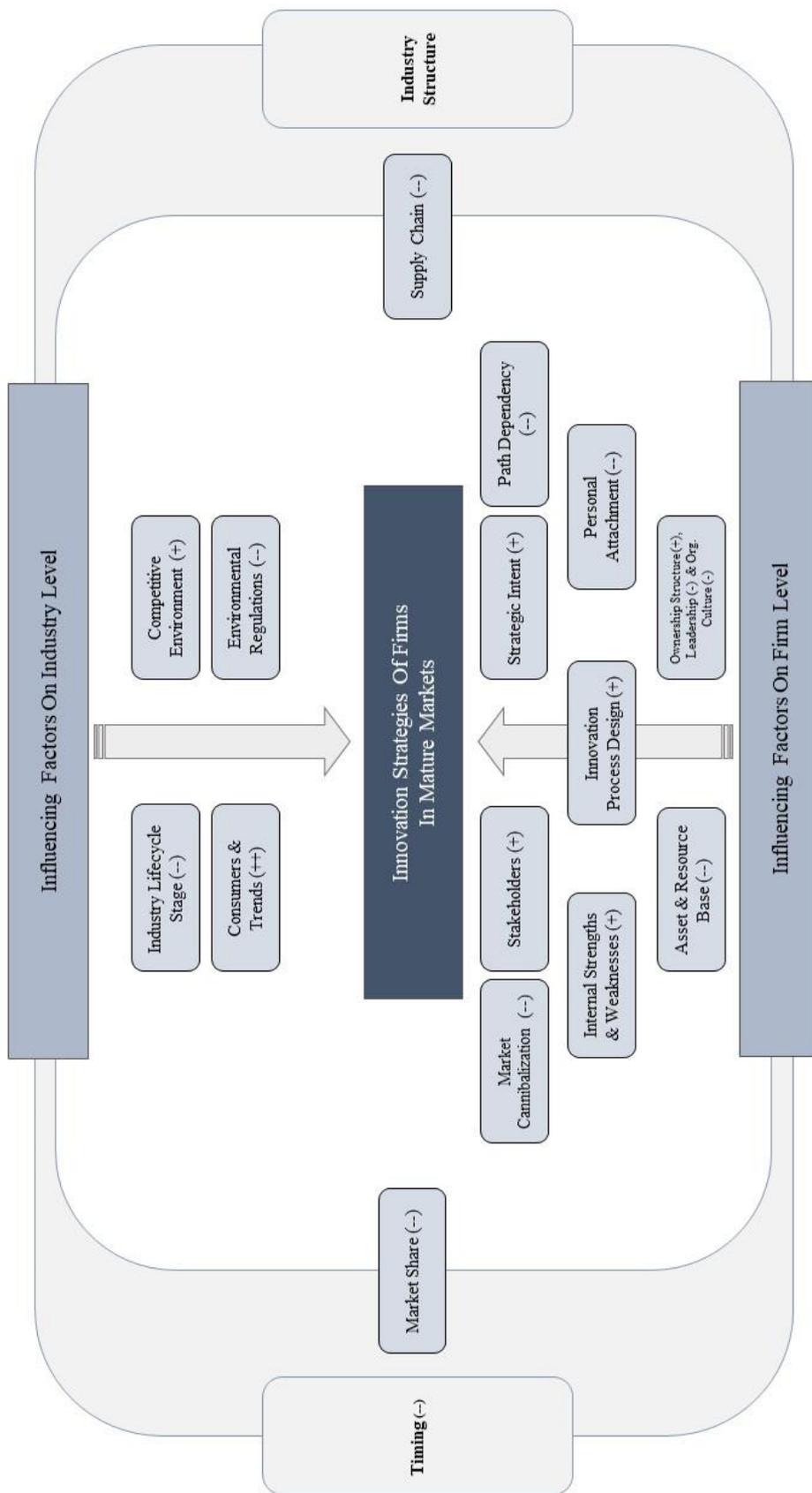


Figure 6: Revised Framework on Factors Influencing Innovation Strategy

5. Discussion and Conclusion

5.1 Main Findings

This study investigated the factors that influence the formulation of firms' innovation strategies; from both a general perspective and in the context of mature markets by means of the dairy industry as a case. According to their nature, the identified factors were categorized in industry-level and firm-level factors, which illustrates the distinction between factors changeable or adjustable by a firm, and factors that influence innovation strategy formulation independent from a firm's actions.

The main findings derived from the industry analysis implied that the dairy industry is characterised by low relative market shares, split among both large players and various smaller firms, which was later supported by empirical findings. The important role of consumers has further been pointed out, as they are considered as main drivers of innovation in this industry. Connected to the consumers, the latest developments of consumption trends seem especially pressing for companies operating in the dairy segment. Accompanying the increasing trend of consuming plant-based dairy alternatives, the pressure caused by substitute products is high, leading to a decreasing growth of demand for dairy. Finally, as PBDA are considered promising regarding sustainable and nutritional requirements, new entry in the dairy segment of the dairy industry is rather low, further reinforced by the significant competition in this market segment.

Building on this industry analysis, the influencing factors summarized in the preliminary framework were addressed and discussed during the primary data collection. Besides reflecting all identified factors to some extent, primary data revealed additional factors that influence innovation strategy formulation, as well as two superordinate factors framing the others. The following section includes an overview of the main findings revealed by the foregoing analysis.

The industry-level factors identified in literature were addressed and confirmed as influencing factors by interviewees from all categories. The most prominent factor that interviewees emphasized 'consumers and trends'. Hereby, interviewees placed high importance on the relevance of consumer-centricity, consumer insights, trend recognition and the consumer as the major driving force for innovative activity. While all categories confirmed the emerging and

growing PBDA trend, interviewees simultaneously showed agreement on the fact that the dairy industry will remain large in the coming years. The second most relevant firm-level factor is the competitive environment, which was described as highly competitive and fast-changing. This was specifically based on the rapid development of the PBDA segment, exerting particularly high pressure on dairy processing companies' existence, on the profitability pressure of the Industry Participants, and on the nature of the FMCG industry. Environmental regulations and the industry lifecycle stage seemed to be of less concern for innovation strategy formulation, although these factors were touched upon by some interviewees in relation to value chain productivity and types of innovations.

All firm-level factors were considered relevant to a certain extent by interviewees during conversations. Hereby, innovation process design was declared as majorly important to innovation strategy formulation, as it influences innovation success. A discrepancy between primary data and existing research was revealed; while literature suggests that collaborative innovation frequently leads to higher success rates, empirical data showed no significant differences, and no reoccurring pattern, between statements on success rates of differing innovation process designs.

Empirical findings revealed that a company's strategic intent can be seen as both enabling and hindering innovation. Based on the analysis, the strategic intent can enable innovation if it is part of the company's vision and embedded in the strategic mission of a company, thereby driving innovation. This became evident mainly in interviews with representatives from non-cooperative firms. On the other hand, a company's strategic intent can hinder innovation if it is solely seen as an obligation arising through market pressure, which became apparent in interviews with cooperative dairy firms. Interviews further revealed that if the strategic intent mainly lies in profitability improvements, innovation tends to be incremental and process related. Connected to strategic intent and its differing impact depending on the firm's internal structure, the ownership structure was the third most prominent factor during conversations, revealing the key finding that the structure of cooperatives often displays a significant obstacle for innovation activity. Interviewees reasoned this mainly by describing the high complexity of decision-making processes due to the democratic structure, and the high dependence of farmers on the product milk, hampering cooperatives from innovating in the PBDA segment. Corporate organizations were described as rather slow in reaction, while smaller firms such as

new entrants in the PBDA segment were described as more nimble and therefore more capable to innovate. Organizational culture was emphasized to be either positively influencing or negatively influencing innovation, depending on the organization's degree of resistance to change.

As mentioned above, five additional factors were identified during interviews. As one of these factors, interview statements entailed that 'stakeholders' explicitly need to be considered during the innovation process, ranging from stakeholders in the value chain, stakeholders as consumers, and particularly the retail as a customer was described to play a vital role for innovation strategy. In addition, 'personal attachment', which is closely related to farmer's pride in dairy production and the cooperatives' roots, were deemed important by interviewees as influencing innovation activity. 'Market share' and 'market cannibalization' specifically refer to the nature of the dairy industry, where market share is distributed between numerous players and therefore often small. The 'supply chain' of PBDA and dairy were mentioned to be notably different, which, according to interviewees, specifically influences dairy companies' considerations to innovate and expand in the PBDA segment. Based on the findings and analysis, the authors suggest several practical implications which are presented in the following section.

5.2 Practical Implications

As summarised above, empirical data revealed additional factors relevant for the formulation of innovation strategy. These factors are included in the empirical framework and complement the initially defined factors. Besides the significance of further factors, primary data revealed that most factors are strongly interrelated with each other. The most significant interrelations and their practical implications are presented below.

Firstly, a relationship can be detected between the industry lifecycle stage (which underlies the overarching design of the industry structure and the timing of innovation of competitors) and the innovation process design. As described in the analysis, due the early stage in the industry lifecycle, plant-based value chains have not (yet) reached the same level of productivity that firms in the established dairy segment have. The lower level of productivity is also apparent in innovation processes, which leads to the derivation that the design of innovation processes

under the consideration of lower – or in the case of incumbent dairy companies higher – effectiveness is dependent on the industry lifecycle stage of the industry a firm operates in.

Primary data allows for the assumption that the influence of innovation process design on innovation strategy formulation is further dependent on the identified factor ‘ownership structure’. The ownership structure of a firm was detected as the root of decision processes in a company due to its significant impact on the complexity and duration of decision processes. The review and analysis of interrelations between the identified firm-level factors further led to the deduction that the factor ownership structure can be seen as a superordinate factor on the firm level. This is not only reasoned by the direct impact of this factor on innovation and innovation strategy, but more so on its indirect influence on all other of the described firm-level factors. The ownership structure is thus assumed to critically influence the design of innovation processes, as these are commonly adapted to decision making processes. This interrelation is derived from the coding analysis and has not been stated as such during the interviews, as no correlations between these factors were particularly highlighted by interviewees. In summary, it is derived that non-cooperative companies rank advantageously regarding successful innovation compared to cooperatives, and benefit from a higher flexibility in formulating innovation strategy. As the ownership structure, however, could only be adapted in the long term, if at all, the revision of the leadership and the organizational culture to facilitate innovation strategy development is recommended in the short term, as these factors have shown to be significantly interwoven with, and influential on, the ownership structure.

As it concerns the innovation process design in the represented firms, it can further be concluded that this factor is additionally influenced by the firm-level factor ‘consumers and trends’. As the interviewees revealed that, amongst others, the incorporation of the customer or consumer into the innovation process through concepts such as open innovation, customer co-creation or lead users, is mostly perceived as beneficial, the interrelation between the factor ‘consumers and trends’ and the factor ‘innovation process design’ is one of the few that were mentioned as such. The interrelations of ‘innovation process design’ with other factors are mainly interpreted as unilateral, since the innovation process design is influenced by other factors, but itself does not seem to influence other factors. In a similar scheme, the factor ‘ownership structure, leadership and organizational culture’ is perceived as highly influential for many other factors without being influenced vice versa. Examples for this are the

interrelation between ‘ownership structure’ and ‘path dependency’, between ‘ownership structure’ and ‘strategic intent’ and between ‘ownership structure’ and the later revealed factor ‘stakeholders’. With the dependency of ‘strategic intent’ on the ownership structure and leadership of a firm, two of seemingly most relevant influencing factors are strongly interrelated which implies the relevance of aligning them appropriately.

The strategic intent is further perceived as being interrelated with the asset and resource base of a firm, since on the one hand, strategies are formulated based on available assets and resources, and on the other hand may demand the acquisition of additional resources. The assets and resources, in turn, significantly shape the profile of internal strengths and weaknesses that influence the success of (intended) innovation and the competitive advantage of a firm. In summary, the formulation of a company’s strategic intent by its owners or internal stakeholders can be assumed equally important to consider as the firms’ available assets and resources, its strengths, and weaknesses. In conclusion to the discussion of interrelations between factors, it can be stated that all factors identified in this study are interrelated to some extent, while some show more significant interrelations than others, as highlighted above. Therefore, more specific interrelations of one or more intermediary factor(s) are assumed and suggested to be considered in future studies.

Overall, it can be concluded that firms operating in industries that have reached maturity and are subject to changes in the industry structure are advised to place particularly high importance on consumer insights and emergent trends. This can allow incumbents and other market participants to adjust their innovation projects and strategies according to the changing environment based on consumer behaviour and trend development. Given the fact that predictions indicate both the further growth of PBDA and the continued existence of dairy, dairy firms might benefit from engaging in both exploitation of their existing resources and exploration of innovation opportunities to maintain and further strengthen competitive power. In addition, leadership and organizational culture, if transformed and shaped accordingly, can display driving forces facilitating innovation strategy formulation. These measures should be taken with a profound understanding of the transition’s intention and its subsequent consequences to be able to sustain competitive success.

5.3 Limitations and Implications for Further Research

The conduction of this study was subject to several limitations due to its specific setting. One limiting factor lies in the choice of a qualitative design, which was intended to allow for a thorough and in-depth understanding of the factors that influence innovation strategies of firms in mature markets. Despite the findings and conclusions drawn, the qualitative nature did not allow for a complete hierarchal categorization of factors regarding their significance and relative weight compared to each other, since the frequency of mentions of a factor does not necessarily imply its importance. Therefore, it is suggested to amplify the scope of this study by employing a quantitative research design in further studies. This would allow for a more precise differentiation and weighting of the factors, as well as the consequential importance placed on each factor during the decision-making process.

Moreover, this study's findings are subject to limited generalizability due to several aspects: firstly, although the interviewed company representatives can be seen as highly valuable contributors to this study, the outreach to individuals was marked by rather low responsiveness of many other approached individuals. Interviewing a greater number of individuals would have led to a higher diversity in professional backgrounds and perspectives and thereby increased the validity of this study. Secondly, the subjectivity of interviewees' personal opinions additionally leads to limited generalizability. Here, a quantification of results would reduce subjectivity and increase reliability. Thirdly, the single-case study design solely reflects the perspectives of the chosen case industry, thus a multiple-case study would be beneficial for the reliability of the derived findings.

Besides these limitations, it is important to note that these findings can be generalized to industries marked by the same industry structure and lifecycle stage, the same competitive environment, and the same influencing power of consumers and trends. However, these findings cannot necessarily be declared applicable to any type of mature industry, as the case industry under study was found to be subject to industry structural changes. As mentioned above, some degree of generalizability for mature industries undergoing structural changes is given, yet would need to be further explored in subsequent studies.

Based on the aforementioned factors, further qualitative research is encouraged on the interrelations of the factors and the implications resulting from these, and further quantitative

research can deliver indications on the weighting of the factors. In addition, a study on the relative impact and importance of the identified factors for different types of innovation is suggested, expanding the empirical framework to more specific company cases. These aspects would further increase the value of research concerning practical implications for decision making in innovation strategy formulation.

References

- Aras, G., Aybars, A. & Kutlu, O. (2010). Managing Corporate Performance: Investigating the Relationship between Corporate Social Responsibility and Financial Performance in Emerging Markets, *International Journal of Productivity and Performance Management*, vol. 59, no. 3, pp.229–254.
- Arla. (2021). Consolidated Annual Report 2020, Available Online: https://www.arla.com/4939f7/globalassets/arla-global/company---overview/investor/annual-reports/2020/update/uk_arla_consolidated_annual_report_2020.pdf [Accessed 11 April 2021].
- Artukoglu, M. & Olgun, A. (2008). Cooperation Tendencies and Alternative Milk Marketing Channels of Dairy Producers in Turkey: A Case of Menemen, *Agricultural Economics (AGRICECON)*, vol. 54, no. 1, pp.32–37.
- Ashford, N. A. & Heaton, G. R. (1976). Environmental and Safety Regulations: Reasons for Their Adoption and Possible Effects on Technological Innovation, *Environmental Policy and Law*, vol. 1, no. 4, pp.172–176.
- Audretsch, D. B. (1995). Innovation, Growth and Survival, *The Post-Entry Performance of Firms*, vol. 13, no. 4, pp.441–457.
- Aydar, E. F., Tutuncu, S. & Ozcelik, B. (2020). Plant-Based Milk Substitutes: Bioactive Compounds, Conventional and Novel Processes, Bioavailability Studies, and Health Effects, *Journal of Functional Foods*, vol. 70, p.103975.
- Baregheh, A., Rowley, J. & Sambrook, S. (2009). Towards a Multidisciplinary Definition of Innovation, *Management Decision*, vol. 47, no. 8, pp.1323–1339.
- Barney, J. (1991). Firm Resources and Sustained Competitive Advantage, *Journal of Management*, vol. 17, no. 1, pp.99–120.
- Barsh, J., Capozzi, M. M. & Davidson, J. (2008). Leadership and Innovation, The McKinsey Quarterly, McKinsey & Company, Available Online: <https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/leadership-and-innovation> [Accessed 13 April 2021].
- Benson-Armer, R., Noble, S. & Thiel, A. (2015). The Consumer Sector in 2030: Trends and Questions to Consider, McKinsey & Company, Available Online: <https://www.mckinsey.com/industries/consumer-packaged-goods/our-insights/the-consumer-sector-in-2030-trends-and-questions-to-consider> [Accessed 12 April 2021].
- Bergek, A., Berggren, C., Magnusson, T. & Hobday, M. (2013). Technological Discontinuities and the Challenge for Incumbent Firms: Destruction, Disruption or Creative Accumulation?, *Research Policy*, vol. 42, no. 6, pp.1210–1224.

- Berle, A. A. & Means, G. C. (1933). *The Modern Corporation and Private Property*, [e-book] New York: Macmillan, Available Online: <http://books.google.com/books?id=zaZZAAAAYAAJ> [Accessed 13 April 2021].
- Bizzozero, J. (2019). Dairy Alternatives Sparking Innovation and Disruption in the Market, Available Online: <https://www.foodbeverageinsider.com/formulation/dairy-alternatives-sparking-innovation-and-disruption-market> [Accessed 9 April 2021].
- Blake, D., Cucuzza, T. & Rishi, S. (2003). Now or Never: The Automotive Collaboration Imperative, *Strategy & Leadership*, vol. 31, pp.9–16.
- Blank, S. (1985). The Impact of Government Intervention in the Australian Dairy Industry, *Agribusiness*, vol. 1, pp.293–310.
- Blind, K. (2012). The Influence of Regulations on Innovation: A Quantitative Assessment for OECD Countries, *Research Policy*, vol. 41, no. 2, pp.391–400.
- Borsatto, J. M. L. S. & Amui, L. B. L. (2019). Green Innovation: Unfolding the Relation with Environmental Regulations and Competitiveness, *Resources, Conservation and Recycling*, vol. 149, pp.445–454.
- Brammer, S., Brooks, C. & Pavelin, S. (2006). Corporate Social Performance and Stock Returns: UK Evidence from Disaggregate Measures, *Financial Management*, vol. 35, pp.97–116.
- Brat, E., Martínez, I. B. & Ouchene, N. (2016). *Innovation Priorities and Practices in Cooperatives*, Montréal: Alphonse and Dorimène International Institute for Cooperatives.
- Brown, R. (2019). How Environmentally Friendly Is Vegan Milk?, Available Online: <https://www.thegrocer.co.uk/plant-based/how-environmentally-friendly-is-vegan-milk/597897.article> [Accessed 22 May 2021].
- Bruno, L. F. C. (2011). Relationship Between Organizational Culture and Innovation Management: An Exploratory, *E-Leader Zagreb*, 2011, pp.1–41.
- Business Research Methodology. (2021). *Purposive Sampling*, Available Online: <https://research-methodology.net/sampling-in-primary-data-collection/purposive-sampling/> [Accessed 20 April 2021].
- Canning, K. (2020). Giving Consumers Plant-Based Alternatives to Dairy, Available Online: <https://www.dairyfoods.com/articles/94524-giving-consumers-plant-based-alternatives-to-dairy?v=preview> [Accessed 9 April 2021].
- Cassell, C. & Symon, G. (2004). Attributional Coding, in *Essential Guide to Qualitative Methods in Organizational Research*, SAGE Publications, Inc., pp.228–241.
- Christensen, C. M. (1992). Exploring the Limits of the Technology S-Curve, Part 1: Component Technologies, *Production and Operations Management*, vol. 1, no. 4, pp.334–357.

- Christensen, C. M. (1997). *The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail*, Boston: Harvard Business School Press.
- Cooley, W. (2020). Dairy Tech Startups in the Spotlight, Available Online: <https://www.progressivedairy.com/news/industry-news/progressive-events-dairy-tech-startups-in-the-spotlight> [Accessed 29 April 2021].
- Cooper, R. G. & Kleinschmidt, E. J. (2001). Stage-Gate Process for New Product Success, *Innovation Management*, vol. U3, pp.1–8.
- Coppola, D. (2021). Dairy Alternatives: Global CAGR by Category, 2018-2022, Available Online: <https://www.statista.com/statistics/693019/dairy-alternatives-global-cagr-by-category/> [Accessed 21 March 2021].
- Corporate Finance Institute. (2021). *Equity Ratio - Definition, How To Calculate, Importance*, Available Online: <https://corporatefinanceinstitute.com/resources/knowledge/finance/equity-ratio/> [Accessed 11 April 2021].
- Creswell, J. W. & Creswell, J. D. (2018a). Review of the Literature, in *Research Design - Qualitative, Quantitative, and Mixed Methods Approaches*, 5th edn, SAGE Publications, Inc., pp.62–89.
- Creswell, J. W. & Creswell, J. D. (2018b). Writing Strategies and Ethical Considerations, in *Research Design - Qualitative, Quantitative, and Mixed Methods Approaches*, 5th edn, SAGE Publications, Inc., pp.125–157.
- Creswell, J. W. & Creswell, J. D. (2018c). The Selection of a Research Approach, in *Research Design - Qualitative, Quantitative, and Mixed Methods Approaches*, 5th edn, SAGE Publications, Inc., pp.40–61.
- Creswell, J. W. & Creswell, J. D. (2018d). Qualitative Methods, in *Research Design - Qualitative, Quantitative, and Mixed Methods Approaches*, 5th edn, SAGE Publications, Inc., pp.254–293.
- Croney, C. C. (2019). Scientific, Educational, and Ethical Challenges Facing the Dairy Industry, Available Online: <https://www.vetfolio.com/learn/article/scientific-educational-and-ethical-challenges-facing-the-dairy-industry> [Accessed 6 May 2021].
- Cucculelli, M. & Peruzzi, V. (2020). Innovation over the Industry Life-Cycle. Does Ownership Matter?, *Research Policy*, vol. 49, no. 1, p.103878.
- Cui, L., Li, Y., Meyer, K. E. & Li, Z. (2015). Leadership Experience Meets Ownership Structure: Returnee Managers and Internationalization of Emerging Economy Firms, *Management International Review*, vol. 55, no. 3, pp.355–387.
- Dairy Foods. (2020). *2020 Supplier Spotlights*, Available Online: <https://www.dairyfoods.com/Dairy-Industry-Supplier-Spotlights> [Accessed 7 April 2021].

- Danone. (2020). Interim Financial Report 2020, Available Online: <https://sec.report/otc/financial-report/261840/Danone-2020-Interim-Financial-Report.pdf> [Accessed 11 April 2021].
- Diekhof, J. & Cantner, U. (2017). Incumbents' Responses to Innovative Entrants – A Multi-Country Dynamic Analysis, Available Online: <http://ftp.zew.de/pub/zew-docs/dp/dp17052.pdf> [Accessed 13 April 2021].
- Drake, A. R., Haka, S. F. & Ravenscroft, S. P. (1999). Cost System and Incentive Structure Effects on Innovation, Efficiency and Profitability in Teams, *The Accounting Review*, vol. 74, no. 3, pp.323–345.
- Drucker, P. (1998). The Discipline of Innovation, *Harvard Business Review*, vol. 80, pp.149–157.
- European Commission. (2021). *Milk and Dairy Products*, Available Online: https://ec.europa.eu/info/food-farming-fisheries/animals-and-animal-products/animal-products/milk-and-dairy-products_en [Accessed 14 April 2021].
- Expert Market Research. (2021). *Global Organic Dairy Market Report and Forecast 2021-2026*, Available Online: <https://www.expertmarketresearch.com/reports/organic-dairy-market> [Accessed 8 April 2021].
- Ferreira, S. (2019). Going Nuts about Milk? Here's What You Need to Know about Plant-Based Milk Alternatives, Available Online: <https://nutrition.org/going-nuts-about-milk-heres-what-you-need-to-know-about-plant-based-milk-alternatives/> [Accessed 9 April 2021].
- Financial Dictionary. (2021). *Market Dominance*, Available Online: <https://financial-dictionary.thefreedictionary.com/market+dominance> [Accessed 7 April 2021].
- Fonterra. (2021). Annual Report 2020, Available Online: <https://view.publitas.com/fonterra/fonterra-annual-report-2020/page/1> [Accessed 11 April 2021].
- Franke, M. (2007). Innovation: The Winning Formula to Regain Profitability in Aviation?, *Journal of Air Transport Management*, vol. 13, no. 1, pp.23–30.
- FrieslandCampina. (2021). Annual Report 2020, Available Online: <https://www.frieslandcampina.com/uploads/2021/03/FrieslandCampina-Annual-Report-2020.pdf> [Accessed 11 April 2021].
- Frost, W. H. (1983). Interpreting the Mature Industry Situation, *International Studies of Management & Organization*, vol. 13, no. 4, pp.63–76.
- Gilbert, X. & Strebel, P. (1987). Strategies to Outpace Competition, *Journal of Business Strategy*, vol. 8, no. 1, pp.28–36.
- Glaser, B. G. (1978). *Theoretical Sensitivity: Advances in the Methodology of Grounded Theory*, San Francisco: University of California.

- Grant, R. M. (1991). The Resource-Based Theory of Competitive Advantage: Implications for Strategy Formulation, *California Management Review*, vol. 33, no. 3, pp.114–135.
- Greenhalgh, C. & Rogers, M. (2010). The Nature and Importance of Innovation, *Introductory Chapters*.
- Hamel, G. & Prahalad, C. K. (1989). Strategic Intent. (Cover Story), *Harvard Business Review*, vol. 67, no. 3, pp.63–78.
- Hannaford, S. (2007). The New Oligopoly, in *Market Domination!: The Impact of Industry Consolidation on Competition, Innovation, and Consumer Choice*, Greenwood Publishing Group, pp.1–14.
- Harrison, D. & Kjellberg, H. (2016). How Users Shape Markets, *Marketing Theory*, vol. 16, no. 4, pp.445–468.
- Hartwich, F. & Negro, C. (2010). The Role of Collaborative Partnerships in Industry Innovation: Lessons from New Zealand’s Dairy Sector., *Agribusiness*, vol. 26, no. 3, pp.425–449.
- Hauser, J., Tellis, G. J. & Griffin, A. (2006). Research on Innovation: A Review and Agenda for Marketing Science, *Marketing Science*, vol. 25, no. 6, pp.687–717.
- Henderson, R. M. & Clark, K. B. (1990). Architectural Innovation: The Reconfiguration of Existing Product Technologies and the Failure of Established Firms, *Administrative Science Quarterly*, vol. 35, no. 1, pp.9–30.
- Hill, C. W. L. & Rothaermel, F. T. (2003). The Performance of Incumbent Firms in the Face of Radical Technological Innovation., *Academy of Management Review*, vol. 28, no. 2, pp.257–274.
- Hockerts, K. & Wüstenhagen, R. (2010). Greening Goliaths Versus Emerging Davids—Theorizing about the Role of Incumbents and New Entrants in Sustainable Entrepreneurship, *Journal of Business Venturing*, vol. 25, pp.481–492.
- Hopenhayn, H. A. (1992). Entry, Exit, and Firm Dynamics in Long Run Equilibrium, *Econometrica*, vol. 60, no. 5, pp.1127–1150.
- IGI Global. (2021). *What Is Asset Specificity*, Available Online: <https://www.igi-global.com/dictionary/asset-specificity/1593> [Accessed 10 April 2021].
- Jacoby. (2017). *Introduction to Understanding Dairy Markets*, Available Online: <https://www.jacoby.com/introduction-understanding-dairy-markets/> [Accessed 17 April 2021].
- Jaumotte, F. & Pain, N. (2005). An Overview of Public Policies to Support Innovation, [e-journal], Available Online: https://www.oecd-ilibrary.org/economics/an-overview-of-public-policies-to-support-innovation_707375561288 [Accessed 29 April 2021].
- Katila, R. & Chen, E. L. (2008). Effects of Search Timing on Innovation: The Value of Not Being in Sync with Rivals, *Administrative Science Quarterly*, vol. 53, no. 4, pp.593–625.

- Kerin, R. A., Varadarajan, P. R. & Peterson, R. A. (1992). First-Mover Advantage: A Synthesis, Conceptual Framework, and Research Propositions, *Journal of Marketing*, vol. 56, no. 4, pp.33–52.
- Kim, H. E. & Pennings, J. M. (2009). Innovation and Strategic Renewal in Mature Markets: A Study of the Tennis Racket Industry, *Organization Science*, vol. 20, no. 2, pp.368–383.
- Koch, C. H. (2020). Brands as Activists: The Oatly Case, *Journal of Brand Management*, vol. 27, no. 5, pp.593–606.
- Lim, S. & Prakash, A. (2014). Voluntary Regulations and Innovation: The Case of ISO 14001, *Public Administration Review*, vol. 74, no. 2, pp.233–244.
- López, S. V. (2005). Competitive Advantage and Strategy Formulation: The Key Role of Dynamic Capabilities., *Management Decision*, vol. 43, no. 5, pp.661–669.
- Love, J. H., Roper, S. & Du, J. (2009). Innovation, Ownership and Profitability, *International Journal of Industrial Organization*, vol. 27, no. 3, pp.424–434.
- Markets Insider. (2018). *Global Cultured Dairy Products Market 2018-2022: Key Challenges, Trends & Drivers - Market to Grow at a CAGR of 7.35%*, Available Online: <https://markets.businessinsider.com/news/stocks/global-cultured-dairy-products-market-2018-2022-key-challenges-trends-drivers-market-to-grow-at-a-cagr-of-7-35-1015231960> [Accessed 17 May 2021].
- Markides, C. (1997). Strategic Innovation, *Sloan management review*, vol. 38, pp.9–24.
- Miles, M. B. & Huberman, A. M. (1994). *Qualitative Data Analysis: An Expanded Sourcebook*, 2nd edn, SAGE Publications, Inc.
- Min, S., Wang, X., Liu, M. & Huang, J. (2018). The Asymmetric Response of Farmers to an Expected Change in the Price of Rubber: The Roles of Sunk Costs and Path Dependency, *Land Use Policy*, vol. 79, pp.585–594.
- Müller, A. (2019). MAXQDA or ATLAS.Ti? How Software Shapes Research, Available Online: <https://methodos.hypotheses.org/1575> [Accessed 7 May 2021].
- Naspetti, S., Mandolesi, S., Buysse, J., Latvala, T., Nicholas, P., Padel, S., Van Loo, E. J. & Zanolli, R. (2021). Consumer Perception of Sustainable Practices in Dairy Production, *Agricultural and Food Economics*, vol. 9, no. 1, p.1.
- Ncube, P., Nkhonjera, M. & Paremoer, T. (2016). Competition, Barriers to Entry and Inclusive Growth: Agro-Processing, *SSRN Electronic Journal*.
- Nestlé. (2020). *Half Year Report 2020*, Available Online: <https://www.nestle.com/sites/default/files/2020-07/2020-half-year-report-en.pdf> [Accessed 11 April 2021].
- Oke, A., Munshi, N. & Walumbwa, F. O. (2009). The Influence of Leadership on Innovation Processes and Activities, *Organizational Dynamics*, vol. 38, no. 1, pp.64–72.

- Onufrey, K. & Bergek, A. (2020). Transformation in a Mature Industry: The Role of Business and Innovation Strategies, *Technovation*, pp.1–14.
- Park, Y. W. (2021). The Impact of Plant-Based Non-Dairy Alternative Milk on the Dairy Industry, *Food Science of Animal Resources*, vol. 41, no. 1, pp.8–15.
- Pavitt, K. (1986). ‘Chips’ and ‘Trajectories’: How Does the Semiconductor Influence the Sources and Directions of Technical Change?, in *Technology and the Human Prospect: : Essays in Honour of Christopher Freeman*, Pinter London, UK, pp.31–55.
- Pavitt, K. & Walker, W. (1976). Government Policies towards Industrial Innovation: A Review, *Research Policy*, vol. 5, no. 1, pp.11–97.
- Pfeffer, J. & Salancik, G. (1978). The External Control of Organizations: A Resource Dependence Perspective, Stanford: Stanford University Press.
- Pisano, G. P. (2015). You Need an Innovation Strategy., *Harvard Business Review*, vol. 93, no. 6, pp.44–54.
- Porter, M. E. (1989). How Competitive Forces Shape Strategy, in D. Asch & C. Bowman (eds), *Readings in Strategic Management*, [e-book] London: Macmillan Education UK, pp.133–143, Available Online: https://doi.org/10.1007/978-1-349-20317-8_10 [Accessed 7 April 2021].
- Porter, M. E. (2008). The Five Competitive Forces That Shape Strategy., *Harvard Business Review*, vol. 86, no. 1, pp.78–93.
- Pouliot, M. (2021). Agropur: Master’s Thesis Interview on Elements Influencing Innovation Strategies of Incumbents in Mature Markets.
- ProVeg e.V. (2019). The Plant Milk Report: Moving towards a Healthy and Sustainable Diet, Berlin, Available Online: <https://proveg.com/plant-based-food-and-lifestyle/vegan-alternatives/plant-milk-report/>.
- Ramanathan, R., Black, A., Nath, P. & Muyldermans, L. (2010). Impact of Environmental Regulations on Innovation and Performance in the UK Industrial Sector, *Management Decision*, vol. 48, no. 10, pp.1493–1513.
- Ramanathan, R., He, Q., Black, A., Ghobadian, A. & Gallear, D. (2017). Environmental Regulations, Innovation and Firm Performance: A Revisit of the Porter Hypothesis, *Journal of Cleaner Production*, vol. 155, pp.79–92.
- Ramanathan, R., Ramanathan, U. & Bentley, Y. (2018). The Debate on Flexibility of Environmental Regulations, Innovation Capabilities and Financial Performance – A Novel Use of DEA, *Omega*, vol. 75, pp.131–138.
- Rauch, A. & Sharp, J. S. (2005). Ohioans’ Attitudes about Animal Welfare, Social Responsibility Initiative, Department of Human and Community Resource Development, The Ohio State University.

- Roos, G. (2014). Integrated Innovation: The Necessary Route to Profitability, in *Strategic Approaches for Human Capital Management and Development in a Turbulent Economy*, de Pablos P. O. & Tennyson, R. D., IGI Global, pp.1–23.
- Roper, S., Du, J. & Love, J. H. (2008). Modelling the Innovation Value Chain, *Research Policy*, vol. 37, no. 6, pp.961–977.
- Rosenbloom, R. S. & Christensen, C. M. (1994). Technological Discontinuities, Organizational Capabilities, and Strategic Commitments, *Industrial and Corporate Change*, vol. 3, no. 3, pp.655–685.
- Rothwell, R. & Zegveld, W. (1988). An Assessment of Government Innovation Policies, in J. D. Roessner (ed.), *Government Innovation Policy: Design, Implementation, Evaluation*, [e-book] London: Palgrave Macmillan UK, pp.19–35, Available Online: https://doi.org/10.1007/978-1-349-08882-9_2 [Accessed 29 April 2021].
- Ruegg, P. L. (2003). Practical Food Safety Interventions for Dairy Production, *Journal of Dairy Science*, vol. 86, pp.E1–E9.
- Santarelli, E. (1991). Asset Specificity, R&D Financing, And The Signalling Properties of The Firm's Financial Structure, *Economics of Innovation and New Technology*, vol. 1, pp.279–294.
- Saunders, M., Lewis, P. & Thornhill, A. (2016a). Critically Reviewing the Literature, in *Research Methods for Business Students*, 7th edn, Pearson Education Limited, pp.70–120.
- Saunders, M., Lewis, P. & Thornhill, A. (2016b). Formulating the Research Design, in *Research Methods for Business Students*, 7th edn, Pearson Education Limited, pp.162–217.
- Saunders, M., Lewis, P. & Thornhill, A. (2016c). Collecting Primary Data Using Questionnaires, in *Research Methods for Business Students*, 7th edn, Pearson Education Limited, pp.436–490.
- Saunders, M., Lewis, P. & Thornhill, A. (2016d). Analysing Qualitative Data, in *Research Methods for Business Students*, 7th edn, Pearson Education Limited, pp.566–625.
- Saunders, M., Lewis, P. & Thornhill, A. (2016e). Negotiating Access and Research Ethics, in *Research Methods for Business Students*, 7th edn, Pearson Education Limited, pp.220–269.
- Saunders, M., Lewis, P., Thornhill, A. & Bristow, A. (2016). Understanding Research Philosophy and Approaches to Theory Development, in *Research Methods for Business Students*, 7th edn, Pearson Education Limited, pp.122–161.
- Sawhney, M., Wolcott, R. C. & Arroniz, I. (2007). The 12 Different Ways for Companies to Innovate, *IEEE Engineering Management Review*, vol. 35, no. 1, pp.45–45.

- Schilling, M. (2017a). Defining the Organization's Strategic Direction, in *Strategic Management of Technological Innovation*, 5th edn, McGraw-Hill Higher Education, pp.109–128.
- Schilling, M. (2017b). Managing the New Product Development Process, in *Strategic Management of Technological Innovation*, 5th edn, McGraw-Hill Higher Education, pp.235–265.
- Schilling, M. (2017c). Standards Battles and Design Dominance, in *Strategic Management of Technological Innovation*, 5th edn, McGraw-Hill Higher Education, pp.67–88.
- Schilling, M. (2017d). Timing of Entry, in *Strategic Management of Technological Innovation*, 5th edn, McGraw-Hill Higher Education, pp.93–106.
- Schilling, M. A. (2017e). *Strategic Management of Technological Innovation*, 5. Edition., New York, NY: McGraw-Hill Higher Education.
- Schweisfurth, T. G. (2017). Comparing Internal and External Lead Users as Sources of Innovation, *Research Policy*, vol. 46, no. 1, pp.238–248.
- Schweisfurth, T. G. & Raasch, C. (2015). Embedded Lead Users—The Benefits of Employing Users for Corporate Innovation, *Research policy*, vol. 44, no. 1, pp.168–180.
- Settembre, J. (2021). People Are Willing to Pay Nearly Twice as Much for Plant-Based Milk, Available Online: <https://www.marketwatch.com/story/health-conscious-people-are-willing-to-pay-nearly-twice-as-much-for-plant-based-milk-2019-07-17> [Accessed 9 April 2021].
- Shahbandeh, M. (2019). Global Top Dairy Corporations 2018, Based on Market Share, Available Online: <https://www.statista.com/statistics/326373/top-20-dairy-corporations-worldwide-based-on-market-share/> [Accessed 7 April 2021].
- Shahbandeh, M. (2020). Market Share of the Global Dairy Products in 2019, by Region, Available Online: <https://www.statista.com/statistics/740935/distribution-of-the-global-dairy-market-volume-by-region/> [Accessed 7 April 2021].
- Shahbandeh, M. (2021). Global Cow Milk Production 2015 to 2020, Available Online: <https://www.statista.com/statistics/263952/production-of-milk-worldwide/> [Accessed 8 April 2021].
- Špička, J. (2013). The Competitive Environment in the Dairy Industry and Its Impact on the Food Industry, 665-2016–44948, *AGRIS on-line Papers in Economics and Informatics*, vol. 5, no. 2, pp.89–102.
- Srinivasan, S. R., Ramakrishnan, S. & Grasman, S. E. (2005). Identifying the Effects of Cannibalization on the Product Portfolio, *Marketing Intelligence & Planning*, vol. 23, no. 4, pp.359–371.
- Statista Research Department. (2014). Consumption of Milk Worldwide 2013/2016, Available Online: <https://www.statista.com/statistics/263955/consumption-of-milk-worldwide-since-2001/> [Accessed 8 April 2021].

- Tavassoli, S. (2015). Innovation Determinants over Industry Life Cycle, *Technological Forecasting and Social Change*, vol. 91, pp.18–32.
- Thietart, R. (2015). Strategy Dynamics: Agency, Path Dependency, and Self-Organized Emergence, *Strategic Management Journal*, vol. 37, no. 4, pp.774–792.
- Trevlopoulos, N. S., Tsalis, T. A., Evangelinos, K. I., Tsagarakis, K. P., Vatalis, K. I. & Nikolaou, I. E. (2021). The Influence of Environmental Regulations on Business Innovation, Intellectual Capital, Environmental and Economic Performance, *Environment Systems and Decisions*, vol. 41, no. 1, pp.163–178.
- Tubb, C. & Seba, T. (2019). Food and Agriculture Report, Available Online: <https://www.rethinkx.com/food-and-agriculture> [Accessed 9 April 2021].
- United Nations. (n.d.a). Transforming Our World: The 2030 Agenda for Sustainable Development, Available Online: <https://sdgs.un.org/2030agenda>.
- United Nations. (n.d.b). The Paris Agreement, Available Online: <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement>.
- van Gelder, K. (2020). Customer Interest in Reducing Dairy Consumption in the Netherlands 2019, Available Online: <https://www.statista.com/statistics/1075909/customer-interest-in-reducing-dairy-consumption-in-the-netherlands/> [Accessed 8 April 2021].
- Von Hippel, E. (1986). Lead Users: A Source of Novel Product Concepts, *Management Science*, vol. 32, no. 7, pp.791–805.
- Wadell, C., Ölundh Sandström, G., Björk, J. & Magnusson, M. (2013). Exploring the Incorporation of Users in an Innovating Business Unit, *International Journal of Technology Management*, vol. 61, no. 3/4, pp.293–308.
- Wagner, M. (2004). The Porter Hypothesis Revisited: A Literature Review of Theoretical Models and Empirical Tests, Public Economics, University Library of Munich, Germany, Available Online: <https://econpapers.repec.org/paper/wpawuwpppe/0407014.htm> [Accessed 29 April 2021].
- Williamson, Ó. (1988). Corporate Finance and Corporate Governance, *Journal of Finance*, vol. 43, pp.567–91.
- Wunsch, N.-G. (2019). Vegetarianism and Veganism among Young Adults in Selected European Countries 2017, Available Online: <https://www.statista.com/statistics/768475/vegetarianism-and-veganism-among-young-adults-in-selected-european-countries/> [Accessed 8 April 2021].
- Wunsch, N.-G. (2020a). Global Organic Dairy Market Size 2018 & 2024, Available Online: <https://www.statista.com/statistics/873651/organic-dairy-market-size-global/> [Accessed 8 April 2021].

- Wunsch, N.-G. (2020b). Global Organic Dairy Sales Value Growth Forecast by Region 2011-2024, Available Online: <https://www.statista.com/statistics/872162/global-organic-dairy-sales-value-growth-by-region/> [Accessed 8 April 2021].
- Yin, R. K. (2018a). Designing Case Studies, in *Case Study Research and Applications : Design and Methods.*, 6th edn, SAGE.
- Yin, R. K. (2018b). Definition of the Case Study as a Research Method, in *Case Study Research and Applications : Design and Methods.*, 6th edn, SAGE.
- Zokaei, K. & Hines, P. (2007). Achieving Consumer Focus in Supply Chains, *International Journal of Physical Distribution & Logistics Management*, vol. 37, no. 3, pp.223–247.

Appendix A

Forces influencing FMCG Industries

Five dominant forces—and an underlying set of trends—will drive change in the consumer landscape over the next 15 years.

Changing face of the consumer	Evolving geopolitical dynamics	New patterns of personal consumption	Technological advancements	Structural industry shifts
<ul style="list-style-type: none"> • Middle-class explosion • Aging population • Women in the workplace • Urbanization • Rich becoming richer • Millennials taking over • Shrinking household size 	<ul style="list-style-type: none"> • Rising labor and commodity costs • Economic power shifts • Economic interconnectedness • Climate change 	<ul style="list-style-type: none"> • Increase in convenience • Focus on health and wellness • Demand for personalization • Shift in discretionary spending • Sharing economy • Focus on shopping experience • Demand for customization • Buying local • Simplification of choice 	<ul style="list-style-type: none"> • Mobile world • Big data for operations • Digital profiles • 3-D printing • Advanced robotics • Autonomous vehicles • Advanced analytics for marketing • Ubiquitous Internet • Social-media-driven consumption • Artificial intelligence • Internet of Things • Virtual reality • Wearables 	<ul style="list-style-type: none"> • Activist investors • Direct-to-consumer models • Continued consolidation • Talent shift/drought
<p>Globally, middle-class spending will almost triple by 2030.</p>	<p>China's real GDP could exceed US real GDP within 10 years.</p>	<p>The size of the sharing economy could exceed \$300 billion by 2025.¹</p>	<p>By 2030, ~3 out of 4 people will own a connected mobile device.</p>	<p>More than 300 companies faced activist demands in 2014 alone.²</p>

Five Dominant Forces (Benson-Armer, Noble & Thiel, 2015)

Appendix B

Interview Guidelines

Part I – General Questions

Number Question

- 1 How would you describe the market environment you operate in considering...
... the competitive environment
... the degree of innovation and the speed of change
... other characteristics?
- 2 What does innovation strategy mean to you?
- 3 Who are the main stakeholders involved in decision-making in your company/
industry?
- 4 What are the main drivers for you to innovate?
- 5 How do you approach innovation considering the factors of...
... stakeholder involvement
... timing
... resource allocation
... leadership and organizational cultures
... consumer needs
... strategic fit?
- 6 How is your innovation process designed in regard to the sources of innovation you
employ (e.g. in-house, outsourced, open innovation platform, collaboration and
partnerships)?
- 7 Which impact do past or ongoing innovation projects have on further innovations &
strategy development?
- 8 Do you experience any hindering/ supporting factors in your innovation process that
are related to...
... your industry lifecycle stage
... your competitive environment
... consumers trends and needs

- ... environmental regulations
- ... internal strengths and weaknesses
- ... the fit with the general strategic intent
- ... your asset base and available resources
- ... the design of the innovation process itself
- ... the ownership structure, the leadership style and the organizational culture of your company?

- 9 What are the goals and the expected outcomes of innovation?
- 10 What priority does innovation have in your organization? Is it part of your mission?
- 11 Which of these factors do you perceive as highly or less influential on your firm's innovation strategy:
- ... the industry lifecycle stage
 - ... the competitive environment
 - ... the consumers and trends
 - ... environmental regulations
 - ... internal strengths and weaknesses
 - ... the strategic intent
 - ... the asset and resource base
 - ... the design of the innovation process itself
 - ... the ownership structure, the leadership style, and the organizational culture of your company
 - ... the dependence on past decisions and operations
 - ... timing

Part II – Industry-specific Questions

Number Question

- 1 What impact do you perceive does the plant-based dairy alternatives market have on dairy producing companies?
- 2 What are the key drivers for PBDA market growth, in your view?
- 3 Do you plan to enter the PBDA market through (product) innovation? If yes, why?
- 4 What factors motivated you to enter the PBDA market and how did you choose the time for your entry?

- 5 What is your intention behind offering plant-based products, now and in the future?
- 6 What difficulties do you face producing PBDA?
- 7 Do you plan to fully transition to plant-based dairy alternatives? If yes, when? If no, why not?
- 8 What are the gaps you are experiencing regarding resources when innovating?
- 9 How does your product portfolio look like now - highly diversified or rather homogeneous?
- 10 What did you base your decision regarding the balanced product portfolio on? Why do you remain producing dairy products?
- 11 Which resources would help you to innovate more efficient towards the production of PBDA?

