

**“How can Q-meieriene collaborate with the dairy farmers to
apply a sustainability standard on their dairy farms?”**

by

Marte Sunde

Supervisor: Anders Riel Müller



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Preface

This master thesis concludes a 2-year master's program in Energy, Environment and Society at the Media and Social Sciences department at the University of Stavanger. Additionally, this marks five years of education at the University of Stavanger. I am glad for the chance to study tourist management, where one of the primary reasons for my interest in sustainability stems from my bachelor's thesis.

I want to express my gratitude to my supervisor Anders Riel Müller for leading me through the writing process and offering insightful feedback. I would also like to thank Geir Vestly and Mette Nygaard Havre for their valuable input.

I would also want to thank my partner and my family for their excellent support during the challenging and at times stressful process of completing my master's thesis.

Finally, I want to thank all of the farmers who took the time to participate in my survey and the interview process; this study would not have been possible without their participation.

Abstract

The purpose of this study is to investigate the farmers providing milk to Q-meieriene. In light of this, I want to investigate the factors that influence their willingness and motivation to apply a sustainability standard, as well as how Q-meieriene may engage with them to encourage adoption of the standard on their farms. By utilising Q-meieriene, one of Norway's largest milk producers which is also targeting a climate positive future by 2030, I have encountered a range of answers associated to both motivation and willingness.

Key issues involved in this research include corporate social responsibility, mandatory and voluntary agricultural standards, as well as motivation and willingness. The gathering of data relied mostly on primary sources but also secondary sources. The gathering of primary data included a structured questionnaire in addition to semi-structured interviews.

Predominant, quantitative data analysis was used. It included descriptive data like means and standard deviation. The research utilised factor analysis, both exploratory and confirmatory, in conjunction with the KMO and Bartlett's tests to evaluate the essence of the variables included in the analysis. In addition, I have performed an explanatory analysis of the qualitative segment of the research.

I have gained an understanding of the factors that influence farmers' motivation and willingness to implement a sustainability standard through a thorough interpretation of the survey and interview results. The analysis also reveals how Q-meieriene could perhaps enhance farmer engagement and support. The results show a greater opportunity for rejection to adopt a sustainability standard if it included expenses, but the farmers would be extremely driven to do so if there were financial or other incentives for doing so.

Keywords: Sustainability, Q-meieriene, Norwegian agriculture, dairy farms, motivation, willingness, EFA & CFA

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1.0 Introduction

Agricultural academics broadly acknowledge the critical nature of sustainable agricultural production systems and the necessity to create good indicators for assessing sustainability while minimizing negative environmental consequences and sustaining necessary agricultural productivity (Smith et al., 2019). Climate change, population growth, urbanisation, and rising living standards significantly impact future agricultural development requirements (Pisante et al., 2010, p. 663). This has brought a growing number of stakeholders to monitor and evaluate agrarian practices, highlighting the need to have suitable indicators for determining the sustainability of specific agricultural activities such as milk production (Latruffe et al., 2016, p. 123).

The primary objectives of Norwegian agricultural and food policies, as outlined in the national governments White Paper No. 11 (2016–2017), are as follows: 1) long-term food security, 2) agriculture in all parts of the country, and 3) creating more added value along with sustainable production with reduced greenhouse gas emissions (Alem, 2021, p. 1; OECD, 2021, p. 2). Growing environmental concerns have driven governments to initiatives aimed at minimising environmental degradation while also ensuring long-term food security and optimum resource usage. Norway has substantial environmental goals, including at least a 40% reduction in greenhouse gas (GHG) emissions by 2030 following the Paris Agreement and strict environmental legislation (Mission of Norway to the European Union, n.d.).

Implying that Norway has strong environmental standards and a commitment to free commerce, agriculture is exempt from economic tools such as greenhouse gas emissions taxes and trade agreements. The selected policy promotes the production, ensuring that locally produced food is accessible and agricultural activity continues nationwide. Agricultural support is justified because it produces collectively generated public goods such as landscape, biodiversity, and rural development, even though production raises emissions (De Roest et al., 2018, p. 229). However, they do drastically increase the price of food for consumers. Additionally, significant levels of support promote consolidation of prior production choices, which inhibits innovation and drives up investment costs downstream, impeding value generation. Furthermore, they negatively influence the environment and increase overall greenhouse gas emissions (OECD, 2021).

The concept of the green economy is applied in the first key policy objective of the January 2019 government declaration: “The Government will continue to build a sustainable

welfare-based society by restructuring the Norwegian economy, promoting growth and creating jobs, improving infrastructure throughout the country, supporting the transition to a green economy and ensuring diversification” (Government of Norway, 2019). While Norway's productivity increase has been faster than the OECD average, it has been done by increasing the production intensity of labour-saving technology, which harms the environment. Norway's present levels of nitrogen and phosphorus surpluses, which put pressure on soil, water, and air quality, are among the highest in the OECD, according to available agri-environmental indicators. In certain regions, agricultural output with large animal densities is also nearing environmental constraints (OECD, 2021).

Due to Norway's geography, most of the country's present agricultural industry would be unviable without government backing. As a result, Norway has the most significant agrarian assistance of any OECD country, with government support accounting for 59% of farmer income (OECD, 2021, p. 2). It is crucial to cooperate with major frameworks for Norwegian agriculture in the future, such as Norway's collaboration with the EU on emissions reduction in the non-quota sector (Hoen et al., 2020). Subsequently, Norway has been a component of the EU Emission Trading System since 2008 under the EEA Agreement. About half of Norway's emissions are incorporated in the EU ETS, making this a cornerstone in Norwegian climate policy (Mission of Norway to the European Union, n.d.). Additionally, there is the climate agreement between the government, Bondelaget, and Småbrukarlaget on decreasing greenhouse gas emissions while increasing carbon absorption in the agricultural sector (Hoen et al., 2020, p. 3).

The Norwegian agricultural sector will contribute to climate-smart food production. In the next years, the state and the Norwegian Farms' Association will provide climate guidance to all farmers. This will be a partnership Bondelaget and other agricultural groups that already provide guidance. The goal of “Klimasmart Landbruk” is to reduce the climate footprint while increasing the competitiveness of Norwegian agriculture (Klimasmart Landbruk, n.d.-c). The objective is to achieve as much climate-friendly and sustainable agriculture as feasible. This will need a great deal of effort on the part of farmers, industry, and society as a whole. Climate change that results in reduced emissions without jeopardizing the use of Norwegian food soil, animal welfare, or world-class animal health is perceived as a challenging but necessary order for the sector (Klimasmart Landbruk, 2020, p. 7). The project's first objective was creating a new instrument, namely agriculture's climate calculator, which was designed specifically for the agricultural industry and the Norwegian farmer and can measure climate

footprints and register climate cuts tailored to each particular farm (Klimasmart Landbruk, n.d.-a).

The climate calculator is based on data provided by the farmer. If they already have a robust database, the outcome will accurately represent the farm's productivity and serve as an excellent starting point for identifying greenhouse gas emission-reducing initiatives. Additionally, these methods will help improve resource mapping and management of agricultural operations (Klimasmart Landbruk, n.d.-b). The climate calculator is actively being rolled out amongst farmers. However, it will not be required to have such climate calculations on the farms until 2025. As a result, the farmers' organisation and the government have reached a climate agreement for 2021-2030 that calls for a 10% reduction in CO₂ emissions for the farmers (Norges Bondelag, 2020).

To meet the predicted rise in food production while simultaneously lowering GHG emissions from dairy cows and care for them, minimum inputs are necessary for a given milk yield, which indicates that production efficiency must be enhanced. Inadequate animal health and welfare conditions, which frequently result in clinical and subclinical diseases, can reduce production efficiency via increased mortality, decreased milk yield, decreased reproductive performance, and increased animal replacement rates, all of which, according to Gülzari et al. (2018), have the potential to increase the GHG emissions produced per unit of product. As an outcome, it has been stated that if animal health and wellbeing are improved, there is the potential to lower the intensity of greenhouse gas emissions and boost productivity, farm revenue, and minimise losses, ultimately increasing farm profitability.

The UN's sustainability goals are the world's collaborative scheme to end poverty, inequality, and climate change by 2030. This plan consists of 17 goals and 169 sub-goals that serve as a shared global orientation for countries, organisations, and civil society (FN, 2021). Q-meieriene has contributed to this endeavour by implementing several initiatives. They have chosen two goals they wish to concentrate on: Sustainability Goal No. 12 focuses on responsible consumption and production, and Sustainability Goal No. 13, which focuses on climate change mitigation. Reducing food waste in production and establishing a "MATVINN" programme to ensure the collection and utilisation of by-products at the dairy farms have contributed to the realisation of Sustainability Goal No. 12. The "MATVINN" project's real benefit will be a decrease in waste at their two dairies in Gausdal and Jæren by focusing on the appropriate production and the right product at the right time. Q-meieriene is

also concentrated on Sustainability Goal No. 13 by adopting this climate positive approach within the organisation that works towards climate change mitigation (Q-meieriene, 2020a). In light of this, Q-meieriene has resolved to become not just carbon neutral but climate positive by 2030 (Q-meieriene, 2020a).

The first step in being climate positive for Q-meieriene is identifying its carbon footprint. In 2019, Q-Meieriene formed a separate interdisciplinary climate panel. The panel works intentionally using real-world metrics that they believe impact climate emissions. They produced a climate report in 2020. They highlighted the primary emission sources that must be addressed going ahead; a new report for 2021 was also newly released (Q-meieriene, 2020b, 2021). Hence, Q-Meieriene seeks to decrease greenhouse gas emissions across the whole value chain, meaning their aim applies to all aspects of their value chain - from agricultural operations to the delivery of finished products to the wholesaler. The emissions are allocated as follows: raw material production accounts for 85% of the climatic footprint, transportation accounts for 4%, product manufacturing accounts for 3%, and packaging accounts for 8%. Enteric methane and nitrous oxide from dairy cows account for the greater part of emissions from raw material production (Q-meieriene, 2021, p. 3). The most critical step in becoming climate positive is to continue to engage with how milk is produced. Accordingly, Q-Meieriene is actively involved in the initiative "Klimasmart Landbruk".

Q-meieriene owns and operates 295 dairy farms across Norway. However, only five farmers have solar panels installed, with another ten farmers planning to do so by 2022. The report for 2021 also reveals other measures such as drainage, ventilation, fossil-free farms, and animal health. The dairy industry is increasingly susceptible to increased public demands for animal welfare and environmental norms. The notion of sustainability in the form of a production-standard may be viewed as a way for dairy farmers and dairies to obtain a competitive advantage and fulfil the claims of stakeholders. Concurrently, Luhmann et al. (2016) claim that national competition also leads to challenges for dairy farmers and has created this need for improved competitiveness. And, as Glavas and Fitzgerald (2020, p. 184) claims "there is no bigger challenge for organisational change management in the contemporary world than achieving greater sustainability".

1.1 Problem statement and research questions

Luhmann et al. (2016) investigated the willingness of future-oriented dairy farmers to engage in a comprehensive sustainability standard. Luhmann's research grouped farmers into three distinct groups: “half-hearted sustainability proponents”, “highly dedicated sustainability proponents” and “profit-oriented sustainability refusers”. The findings of Luhmann's research give several launching points for drawing management implications for the effective implementation of sustainability standards in European dairy farming, these implications may be derived from a number of viewpoints. Understanding what really motivates farmers to make more sustainable decisions was the subject of Luhmann's research, and it will serve as the impetus for this study. As a result, the purpose of this case study research is to better understand farmers' willingness and motivation to embrace a sustainability standard but also how Q-meieriene may work to increase farmer support via this process. The main research question I wish to answer is, therefore:

How can Q-meieriene collaborate with the dairy farmers to apply a sustainability standard on their dairy farms?

I will investigate the dairy farmers' of Q-meieriene willingness, as well as motivation, to implement a more sustainable standard at their farms, since this will be a critical success factor in becoming a climate positive dairy (Luhmann et al., 2016, p. 244; Q-meieriene, 2021, p. 2). Meanwhile, Q-meieriene has the difficulty of needing dairy farmers to minimise their emissions. The climate agreement for 2021-2030 that calls for a 10% reduction in CO2 emissions for the farmers is too small a decrease for the Q-meieriene, who want further cutbacks (Norges Bondelag, 2020). Yet, Q-meieriene has lacked the resources to actively work on their farms with climate improvements. Meaning that, according to the Norwegian agricultural climate plan, the farmers' requirements are insufficient compared to Q-meieriene demands (Klimasmart Landbruk, 2020). The goal of the thesis is to get an understanding of the dairy farmers' willingness and motivation in connection to sustainability at Q-meieriene. I want the responders to walk away with information, awareness, and fresh perspectives on sustainability. The study's goal is also to illuminate the many aspects of sustainability.

In relation to this, the sub research questions I will look closer at will be as follows:

- Which factors impact farmers' willingness and motivation to accept a sustainability standard?
- How can Q-meieriene work to enhance farmer support of a sustainability standard?

1.2 Terminology

Motivation

Motivation refers to an individual's needs, desires, wants or urges. It is the process of motivating individuals to take specific behaviours to reach particular objectives.

Sustainability standard

Sustainability as a production standard may be seen as a way for dairy farmers and dairies to obtain competitive advantages and satisfy the needs of stakeholders (Luhmann et al., 2016, p. 243).

Voluntary Sustainability Standards

Voluntary sustainability standards (VSS) are guidelines and standards that guarantee a product is manufactured, processed, and delivered sustainably in order to contribute to specified environmental, social, and economic goals. The standards are generated from stakeholder input and include quantifiable and enforceable criteria for promoting sustainable production results (Smith et al., 2019, p. 2130).

Willingness

Willingness may be defined as an eager acceptance or compliance with the need to perform an action. Farmers' willingness to engage in implementing a sustainability standard is critical to its effectiveness (Luhmann et al., 2016, p. 243).

1.3 Structure of the study

The thesis is organized into six chapters to address my research questions. The first chapter will include an introduction to the thesis subject as well as a presentation of both the main research question and the sub research questions. The second chapter will give theoretical viewpoints on the research questions in order to form a comprehensive theoretical framework. The third chapter describes the methodological considerations made, as well as the data collection methods employed. In chapter three, exploratory and confirmatory factor analysis, as well as an explanatory analysis, were also carried out. The findings of this research are presented in chapter four, beginning with the demographic data. Then in the same chapter, I will discuss the results from in chapters on sustainability perceptions, Q-meieriene's climate positive actions, and motivation and willingness. In chapter five, the findings will be analysed and discussed in comparison to the conceptual and analytical framework. In chapter

six, I will finish with some concluding remarks as well as some recommendations for further research.

1.4 Limitations of the study

I am performing a case study on how a Norwegian dairy corporation, such as Q-meieriene, may motivate and support its farmers to adopt a sustainability standard in a Norwegian context. This research will primarily focus on dairy as a distinct agricultural sector, allowing for more in-depth research. Nonetheless, it is essential to keep in mind that the conclusions of this research cannot be generalized to the agricultural sector as a whole nor to the dairy industry as a whole, since the emphasis is on farmers that provide milk to Q-meieriene. Thus, leaving us with a geographical scope and limiting it in such a manner, this involves farms situated across Norway.

The data collection is limited to a questionnaire and an interview using a sequential mixed-methods explanatory design. Since this is a case study, I may utilise both quantitative and qualitative data collection methods. In addition to an explanatory analysis, I will use descriptive design, which gathers data utilised to answer a variety of what, when, and how questions relevant to the group of farmers from Q-meieriene (Yin, 2018).

2.0 Theoretical perspective

The importance of theory in research is critical. There must be a link between the researcher's theoretical point of view and what is being researched. A crucial consideration is how we see the social environment in terms of our ontological assumptions and what constitutes the essence of knowledge. The desire to contribute theories is essential for fruitful study and growth in the current stage of learning (Al-Saadi, 2014). This chapter's objective is to gain insights into notions and theoretical methods in order to build a more comprehensive theoretical framework. To address my research questions, I will apply theory of corporate social responsibility, agricultural industry standards, and voluntary sustainability standards. In addition, motivation and willingness theory will serve as the foundation for my method.

2.1 Corporate social responsibility (CSR)

It was not until the 1990s, businesses faced growing pressure to adopt more ecologically sustainable and socially responsible corporate operations, as well becoming active community members. Competitive dynamics for Q-meieriene, such as brand positioning, marketing, and innovation, as well as increasing pressure from market factors such as globalization, greater regulatory pressure, and sustainable development, all contribute to the case for CSR adoption (Deselnicu et al., 2012, pp. 3-5). Strand et al. (2015) then refers to the fact that CSR and sustainability are seen as close synonyms by some and as wholly separate ideas by others. When seen as distinct concepts CSR is often regarded to be concerned with social concerns, while sustainability is concerned with environmental ones. In fact, critical management studies see corporate social responsibility (CSR) and sustainability efforts as cynical discourses and weapons of power that aim to obscure the substance of what firms genuinely do in order to legitimize their sustainability credentials in society (Glover, 2020, p. 1807).

Corporate social responsibility has a long and varied history; it is primarily a twentieth-century phenomenon, particularly from the early 1950s to the present. Europe has been enamoured with CSR, and there is enough evidence that European researchers and practitioners take this social concern seriously, as shown by official papers, research, conferences, and consultancies (Carroll, 2008, pp. 19-20). While the stated goal of CSR efforts is to promote social and environmental stewardship, academics have shown how social responsibility can also help firms improve their reputations and build a loyal base of customers, to engage high-quality employees or to separate one's own goods from those of

rivals, enabling a business to continually charge a premium price (Deselnicu et al., 2012, p. 3).

As per the triad-network model, three separate yet interrelated networks could impact Q-meieriene`s sustainability initiatives: economic, political, and social networks, each having its own analytical perspective, institutional structures, and players. Economic networks represent the interactions of economic players that are guided by economic laws and resources. With a focus on the firm's interdependence on market power and resources, as well as their structural effect on the continuity and change of economic processes. Policy networks are a representation of the interactions between government agencies and private sector entities that are guided by political-administrative norms and resources. The analytical emphasis is on actors' cooperation and conflict, their interdependence in terms of political power and organizational capability, and "the rules of the game" that govern their interactions. Societal networks depict the relationships between industry and civil society, with an analytical emphasis on the growth of social movements and non-governmental organizations and their effect on environmental reform, directly or indirectly via government or business players (Thongplew et al., 2016).

Such a network is an effective tool for deciphering procedures that are not only regulated by government hierarchy or market transactions, but rather by the interaction of several players and institutional logics. Furthermore, the triad-network model benefits from the fact that it integrates analytical findings from research conducted from a variety of institutional perspectives. However, this benefit of inclusivity comes with a cost. The model's network interactions are varied, and for certain stakeholders, their network location is rather vague. As a consequence, the model is less well-suited to the thesis's quantitative analysis (Thongplew et al., 2016, p. 8). However, I will be able to utilize it as a heuristic tool while collecting descriptive data.

While the triad-network model identifies businesses as change agents in environmental transformations, previous research has mostly examined industry's greening in response to economic, policy, and social networks. As seen in Figure 2, there is a CSR strategy that encourages businesses to evaluate and address the interests and needs of people or organizations, referred to as "stakeholders," who may impact or be affected by their activities. Stakeholders include those who are directly involved with the business as well as those who are indirectly linked with the running of the firm. By emphasizing the relevance of

players in the economic, policy, and social networks that impact the business, CSR is congruent with and compatible with the triad-network model (Thongplew et al., 2016, p. 8).

In terms of the environment, CSR principles emphasize the importance of businesses assuming environmental responsibilities beyond legal compliance and mitigating environmental impacts from not only their own activities, but also those of stakeholders under their influence, which is primarily what Q-meieriene does when they include the entire value chain in the emissions calculation. In this regard, Q-meieriene takes an active role in developing strategic activities that can be integrated into business strategies and operations, as well as engaging stakeholders, such as farmers, in their CSR strategies aimed at enhancing environmental sustainability throughout the production–consumption chain and throughout society. By implementing proactive and targeted CSR efforts Q-meieriene has the potential to influence and involve farmers in initiating environmental changes at the economic, policy, and societal levels (Thongplew et al., 2016, p. 9).

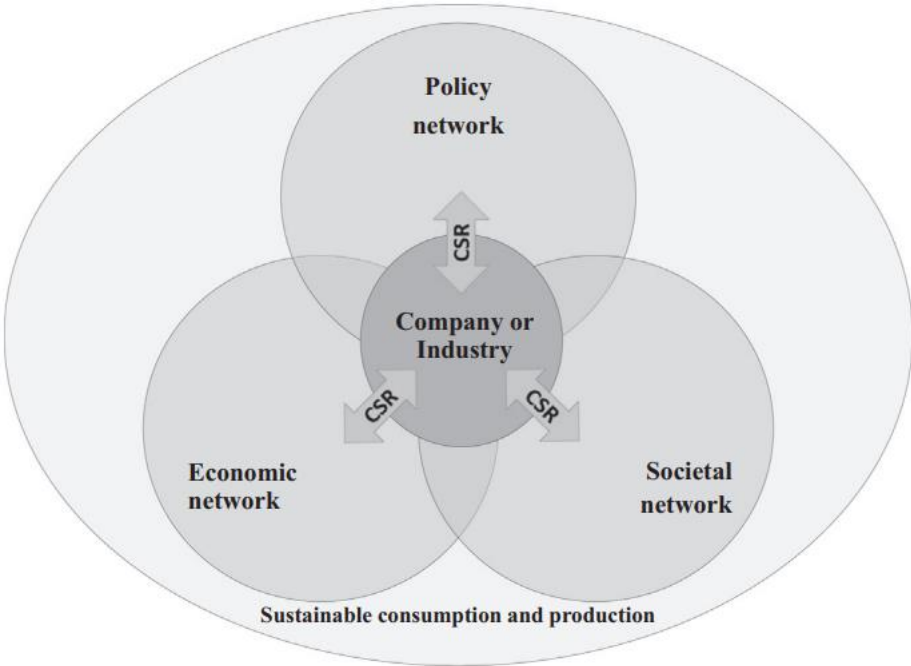


Figure 1 The triad-network model and CSR framework

Note. From “Transformation of the dairy industry toward sustainability: The case of organic dairy industries in the Netherlands and Thailand” by N. Thongplew, C.S.A. van Koppen & G. Spaargen, 2016, Environmental Development, 17, p. 9 (<https://doi.org/10.1016/j.envdev.2015.11.005>)

The Innovation Center for the U.S. dairy industry defines CSR as “providing consumers with nutritious dairy products they want, in a way that makes the industry, people and the earth economically, environmentally and socially better — now and for future

generations” (Glavas & Fitzgerald, 2020, p. 185). For Q-meieriene, this term refers to measures that seem to advance some societal good in addition to the firm's interests and those mandated by law. In 2012, WWF named the dairy sector, along with bioenergy, aquaculture, and palm oil, as one of the main businesses that might help move markets toward a more sustainable future (WWF, 2012). However, in today's society, there is no greater challenge for organizational change management than ensuring greater sustainability. In addition to what is needed by law, a business's policies and operations that benefit society and the environment are a key issue, given the exponential scarcity of natural resources (Glavas & Fitzgerald, 2020, p. 184).

According to Glavas and Fitzgerald (2020), CSR transformation and stakeholder interactions have been extensively examined on an internal, external, and collective level. Internally, referring to those in formal positions of power inside the sector, senior management's impact on CSR transformation is widely documented; yet less is known about how employees actively participate to change rather than being passive recipients. Externally, the contacts of the company with its different stakeholders, but not at the individual employee level. Externally, that is, those located along the value chain (farmers, processors, transport). Thus, stakeholder interaction may all contribute to change jointly, both internally and externally.

2.2 Industry standards in agriculture

Hoehn et al. (2020) offers a report in which they propose industry standards as a means of establishing the climate calculator as a method of agricultural assessment. It is also one of the eight primary objectives of the Norwegian agricultural sector as seen in Table 1. The calculator and system for Klimasmart Landbruk are based on the calculating model HolosNOR and the infrastructure of Landbrukets Dataflyt for data collection and exchange in agriculture. The farmer individually determines if their farm's emissions are to be calculated, and consents to Landbrukets Dataflyt collecting data from a variety of actors and systems. Digital calculations may then be performed and given to the farmer (Landbrukets Dataflyt, n.d.).

It is difficult to define what constitutes an industry standard, but it may serve a variety of purposes, for example, it might be based on custom agreement amongst actors in the industry, a standard established by a predominant company, or it can be imposed by legislation or regulation. At least the agricultural climate plan is now a fixed focus for the climate efforts of the business. The industry is responsible for implementing steps to reduce

emissions and increase carbon storage. The objective for the sector to be able to verify climate status has grown more distinct, and by 2025, all farmers are expected to have a climate calculation.

	Main objective	Scheme
1	Implementation of the climate calculator and increased emphasis on climate advice.	Before the end of the year, all farmers utilize the climate calculator and receive climate advice.
2	Feeding, breeding, and health of livestock that is more climate-friendly and sustainable.	Concentrated efforts on improving roughage quality, livestock breeding in cows, sheep, and pigs, healthier animals with a less carbon footprint, and the use of feed additives.
3	Fossil-free machinery.	Biofuels and devices that operate on electricity, biogas, or hydrogen are displacing fossil fuels.
4	Fossil-free heating.	Agriculture is transitioning to non-fossil fuel heating.
5	Improved fertilizer usage and agronomic practices.	Increased fertilizer uses through more ecologically friendly spreading methods, increased storage capacity and spread time, progressive phase-in of cover on fertilizer storage, and increased small-scale biogas production on farms. Additionally, proper drainage leads to less greenhouse gas emissions.
6	Use of animal manure as a raw material in industrial biogas plants.	Increased use of animal manure for biogas generation helps agriculture and other industries reduce greenhouse gas emissions.
7	Soil as carbon storage.	Carbon may be removed from the atmosphere and stored in plant biomass and soil through the use of catch crops, biochar, and grazing.
8	New climate technology	The development and phase-in of innovative technologies capable of reducing greenhouse gas emissions and increasing carbon storage.

Table 1 Norwegian agricultures eight primary objectives

Note. From «Landbrukets klimaplan» by Norges Bondelag, 2020 (<https://www.bondelaget.no/bondelaget-mener/miljo-og-klima/klima/les-klimaplanen-her>).

KSL is an industry standard that helps develop a positive reputation for Norwegian food manufacturing, which comprises of self-audit checklists and guidance for usage on farms. It is based on rules and regulations as well as being a helpful instrument for the management of the farm (Kvalitetssystem i landbruket, 2021a). The Norwegian Food Safety Authority and the Norwegian Labour Inspection Authority acknowledge the standard as a national industry standard. When a farmer has well-established KSL procedures, it is recognised that the operation complies with laws, rules, and other requirements for producers of raw materials (Norges Bondelag, n.d.-a).

Farm Sustainability Assessment (FSA) is a worldwide reference standard for sustainable agriculture produced by SAI Platform against which other certification systems and standards may be evaluated. In this evaluation, KSL achieves a silver status in the worldwide certification system. In addition to the development of SAI certification by KSL, it is crucial for the Stiftelsen Norsk Mat that the certification has usefulness for the producer in relation to the production. The investigation into what is required to attain the FSA's gold level will continue. Several strategies to manage irrigation water and wastewater, as well as the usage of a climate calculator, are among the KSL areas that must be improved in order to obtain the FSA's gold level (Kvalitetssystem i landbruket, 2021b).

The Norwegian Directorate of Agriculture also administers a subsidy programme for particular environmental measures in agriculture (SMIL). The objective of the programme is to support the preservation of natural and cultural heritage assets in agricultural cultural landscapes and prevent agricultural pollution. Compliance with regulatory criteria for cultural landscapes or pollution is seen as a routine aspect of agricultural activities and is not a priority for SMIL funding. The municipality must determine which environmental values are ordinarily protected via regular operations and which environmental values are to be included in this plan. In compliance with these laws, the farmers must comply to certain standards, however grants will only be awarded for measures that go above and beyond the typical agricultural activities, which can be viewed as voluntary sustainability requirements in this instance (Landbruksdirektoratet, 2021).

2.2.1 Voluntary sustainability standards

Voluntary sustainability standards has become a popular private governance framework for more sustainable agri-food value chains (Dietz & Grabs, 2022). The standards are formed on stakeholder principles and include quantifiable and enforceable criteria to

support sustainable production results (Smith et al., 2019). “The ‘utility’ of implementing a sustainability scheme for a farmer is composed of the influence of the individual attributes of a presented alternative, depending on the personal and operational factors of the respective respondents”, thus two requirements must exist for VSS to provide result additionality in the field. To begin, standards must establish behavioural guidelines that are more advanced in terms of environmental, social, and economic sustainability than existing agricultural methods. Second, these rules must be properly applied in practice in order for them to be transformed from rules on paper to rules in reality (Hannus et al., 2020).

Sustainability as a concept with a definition seems irrelevant in many Norwegian farmers’ everyday operations. However, by seeing how farmers express their concerns, it is reasonable to determine that the ideas underlying a triple bottom line definition of sustainability are applicable. Luhmann defines sustainability in terms of these three pillars, wherein we have ecological, social, and economic responsibilities, all of which contribute to long-term sustainable growth at the firm level. Businesses that strive for greater sustainability could include ecological and social aims in addition to their core goal of profit (Luhmann et al., 2016, p. 244). For example, farmers are explicitly engaged in the economic sustainability of the farm, some with more economic output in mind than others (Bjørkhaug, 2006, p. 129).

The first sustainability standards were created with the goal of documenting and analysing complete agricultural operations, thus the triple-bottom-line approach is a form of reporting that takes into consideration the three aspects of performance: social, environmental, and financial (Hannus et al., 2020, p. 1). Slaper and Hall (2011) once indicated that the issue is not in defining TBL, but in quantifying it. This is different from conventional reporting frameworks in that it includes environmental and social variables that may be difficult to measure. Businesses that seek for better sustainability should combine environmental and social concerns with their primary objective of profit. According to the triple bottom line, investors know that when environmental, social, and economic interests are matched, some of the highest returns are obtained (Luhmann et al., 2016, p. 244). These three pillars may result in long-term sustainable development for Q-meieriene at business level, since the TBL “captures the essence of sustainability by measuring the impact of an organisation’s activities in the world” (Slaper & Hall, 2011, p. 1).

As with other businesses that are subject to public scrutiny, the notion of sustainability has grown in importance in the agricultural industry and its numerous subsectors. These

notions mostly adhere to the three pillars' approach to sustainability but also include an element of animal ethics or animal welfare. Thus, European animal farmers are now required to comply with not just animal welfare regulations, but also specific private animal care requirements in order to sell their goods. Bock and van Huik demonstrate, in Lundmark et al. (2018), that the primary motivation for farmers to join any voluntary standard was to get a higher price for their goods and increased market access. They found, however, that farmers who adhere to an organic standard or a specialized animal welfare standard were primarily driven by ethical considerations and the prospect of increasing animal welfare.

Different combinations of statutory mandatory regulation and self-regulation with voluntary standards imply that internal control allows a great deal of leeway with regards to rules of the game and the execution of roles, as a result of the specification of rules of engagement. A voluntary standard would prevent many breaches that cost the farmers money and others that are cost neutral; it will also prevent some infractions that benefit them financially in the short term, for the long-term advantage of encouraging farmer dedication to compliance (Ayres & Braithwaite, 1992, p. 106).

Although voluntary standards are seen as advantageous, the obstacles associated with this kind of control have been discussed. Those who implement voluntary standards could lack an understanding of how to regulate one's own business. This is especially prevalent in small businesses, such as smaller farms, where there is frequently a lack of understanding of the risks associated with their work as well as limited operating resources. This implies that a voluntary standard relies on the willingness of workers to do the labour, and that firms must be offered incentives to participate. With regard to internal control, firms need knowledge of what must be done and how it should be done, as well as change and motivation (Dawson et al., 1988).

2.3 Motivation and willingness

Motivation has a significant role in an individual's willingness to participate in or accept a sustainability standard. Typically, research differentiates between intrinsic and extrinsic motivational factors. Intrinsic motivation is often characterized as “doing something for its own sake”, such as enjoying the action itself or adhering to own conventions and beliefs. While extrinsic motivation is defined as the pursuit of an instrumental goal, it refers to external motivations for a person to behave in a specific manner, such as money incentives or job performance ratings in the workplace. In a farmer setting, intrinsic motivation occurs

when a farmer participates in a sustainability standard because it is enjoyable, and extrinsic motivation occurs when a farmer participates in a sustainability standard in order to physically obtain a bonus or reward. According to Reiss (2012, p. 152), extrinsic incentives may erode intrinsic interest, which means that for a farmer seeking a bonus, extrinsic incentives might erode their enjoyment of participating in a sustainability standard.

Luhmann et al. (2016, p. 245) observes that farmers' willingness to commit to sustainability is primarily driven by economic incentives. Similarly, financial incentives are a significant motivator for farmers to adopt greater standards of animal care (Trujillo-Barrera et al., 2016). Additionally, Li et al. (2021, p. 2) notes that research has demonstrated that householder characteristics, environmental awareness, technical characteristics, social influences, and public policy, among other factors, all have a significant impact on farmers' behaviour when it comes to adopting sustainability standards.

Faced with these obstacles identified by Luhmann et al. (2016), dairies are presently seeking a long-term plan to suit the needs of society and merchants while preserving or even enhancing their competitiveness. The concept of a sustainability standard for producers, understood as a commitment to more sustainable milk production, as evidenced by, for example, a focus on high milk quality, improved animal health, and a longer life expectancy of dairy cows, can be viewed as a means for farmers and dairies to gain and maintain competitive advantages. Thus, they can satisfy the needs of the general public, merchants, and other stakeholders (Luhmann et al., 2016, p. 244). By other stakeholders, I mean Q-meieriene, thus it will be extremely pertinent for me to expand on Luhmann's analysis since it already provides and is a comparable component of what the Q-meieriene need to fulfil their objective of being climate positive by 2030.

Luhmann et al. (2016) derived factors indicating farmers' willingness to participate in a sustainability standard from the literature on technological acceptability, the theory of planned behaviour, and farmers' willingness to participate in sustainability efforts; therefore, the same theory will be applied in this study. In Luhmann's approach, technology is used in a broad sociological sense to refer to any substitution of equipment for human labour; thus, it can encompass industrial production techniques, information and communication technologies, and management techniques such as certification systems and standards (Luhmann et al., 2016, p. 245). Consequently, perceived usefulness and intention to apply a standard, extrinsic incentive, intrinsic motivation, and farmers' opinion of the adequacy of

existing lenient sustainability measures were all employed to combine respondents into homogeneous groups. Luhmann was then able to divide farmers into three distinct categories: “half-hearted sustainability proponents”, “highly dedicated sustainability proponents” and “profit-oriented sustainability refusers”. In light of the fact that Luhmann's study has already established three categories for farmers based on their motivation and desire to follow a sustainability standard, I hope to utilise it to categorise the participating farmers when discussing the results.

In agricultural economics research, the Technology Acceptance Model has been utilised frequently to analyse the willingness of players throughout food supply chains to adopt or invest in new technologies (Luhmann et al., 2016, p. 245). According to Luhmann et al. (2016), the Technology Acceptance Model (TAM) has been used several instances to analyse the willingness of stakeholders throughout food supply chains to utilise or invest in new technology, and in terms of VSSs, it could be considered one of the most valuable theoretical frameworks used to explain various intentions and behaviours in various settings (Rezaei et al., 2020).

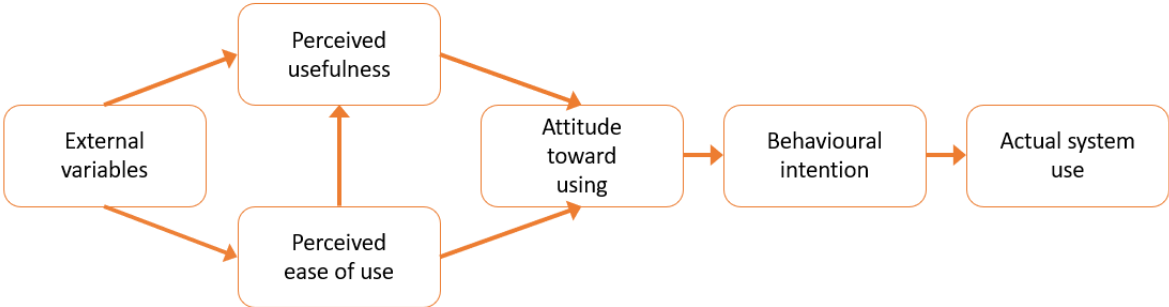


Figure 2 Technology Acceptance Model

TAM, in figure 2, is based on the principle of reasoned action. It employs the concepts of "perceived usefulness" and "perceived ease of use," which are subjective opinions influenced by external influences. In turn, both of these characteristics influence "attitude toward using" and "behavioural intentional usage." The TAM is used to depict the reciprocal link between external variables that influence a user's adoption of technology and elements that influence actual behaviour. This model proposes a link between external factors and perceived usefulness and perceived ease of use. From there, we can see that perceived ease of use influences perceived usefulness, thus if something is particularly difficult to use, it will impact a farmer's perspective of how valuable something is. Most people are cognitively lazy, and when paired with farmers' hectic work weeks, they want to be able to pick up a new piece

of technology and use it straight away without having to read instruction manuals or go through long installation processes. Going forward, the perceived usefulness and perceived ease of use will generate a particular attitude toward utilising the piece of technology, which might be good or negative, and this attitude will lead to behavioural intention to use.

The theory of Planned Behaviour serves as a framework for describing how knowledge and motivation impact behaviour. Ajzen (1991, p. 179) defines three categories of beliefs: behavioural, normative, and control beliefs, as well as the associated conceptions of attitude, subjective norm, and perceived behavioural control. The theory is aimed at predicting and explaining human behaviour in given settings. The individual's purpose of executing a particular behaviour is a crucial aspect of the notion of planned behaviour. Intentions are thought to convey the motivating variables that impact an action; they could then be signs of how hard dairy farmers are willing to try, of how much effort they intend to put in to accomplish a particular behaviour. In general, the stronger the intention to engage in a behaviour, the more likely its performance should be. The version of the majority is influenced by non-motivational variables such as time, money, skills, the collaboration of others, and availability of necessary opportunities. These elements, combined, show people's inherent power over their behaviour (Ajzen, 1991, pp. 181-182).

Thus, according to Ajzen's theory, it takes willingness to do a certain behaviour since willingness will capture the motivating components that impact the behaviour (Udawatta et al., 2015). But individual preferences cannot be ignored since they are influenced directly by habits, social environment, and social structure. There are several hypotheses on how the structure of the society in which an individual lives constrains their behaviour. The presence of structure may be established when a collection of unrelated occurrences exhibits precise patterning and consistency throughout time. Whereas the existence of three major sociological schools of thought centred on the structure-agency dispute. Bourdieu used the term 'habitus' to illustrate the relationship between structural conditions and the individual (Udawatta et al., 2015, p. 139).

Bjørkhaug (2006) investigated sustainable agriculture in the context of Norwegian farmers. In that way, she determined whether they valued the principles associated with a 'politically correct' definition of sustainability that incorporates the triple bottom line approach, in which the economy, society, and environment are all treated equally. The

analysis of Bjørkhaug's work is predicated on Bourdieu's theory of practice and ideas of field and habitus (Bjørkhaug, 2006, p. 125).

Bourdieu is engaged in what individuals do on a daily basis; in this example, Bourdieu contributes to the body of knowledge on farmer behaviour and decision-making (Glover, 2015, p. 131). According to Glover (2015), Bourdieu “attempts to decipher the social logic of group-specific tastes, dispositions to act in a certain way under given circumstances, lifestyles and habits existing alongside each other within the social space”, collating them under the broad concept of everyday culture, which lends itself well to studying farmers and their actions. The field is regarded as a social area where participants (individuals or groups) are positioned according to their available resources. The specialisation provides a framework (and game rules) within which players may influence resources via their actions (Glover, 2015, p. 132). “In the field (defined as the dairy industry), agents (farmers) realise their individual strategies by utilising specific capitals to play the game whereby they hope to retain and obtain power within that field” (Glover, 2015, p. 131). All of this enables consideration of the behaviours that each actor has inside their own fields, namely the dairy industry.

3.0 Methodological approach

The next part discusses the methodology utilised to accomplish the research study's objectives and answer the research questions. The method may be defined as the process of producing reliable and trustworthy facts about reality (Blaikie & Priest, 2019). To deal with this, one must devise a strategy for moving forward, whereas the process is the method (Jacobsen, 2015, p. 15). This section will explain my methodological approach, including my research strategy, data collecting procedures, research ethics, exploratory factor analysis, validity and reliability, and sources of inaccuracy.

3.1 Deductive and inductive research strategy

Philosophers have traditionally distinguished between inductive and deductive thinking, with inductive reasoning taking a particular case and drawing a general rule from it and deductive reasoning taking a general rule and inferring the condition of a specific subject from it. The phrases "inductive" and "deductive" are frequently used by social science researchers to refer to styles of theorising rather than types of reasoning. Inductive theorising begins with empirical data and progresses to developing a theory based on that information. On the other hand, deductive theorising starts with an approach and then infers what the evidence is anticipated to indicate based on the conclusions from that theory (Okoli, 2021, pp. 1-2).

By examining theory-building from inductive, abductive, and deductive theorizing perspectives, Okoli (2021) created a cohesive framework that covers multiple research epistemologies. Based on this paradigm, they provide a straightforward method of thinking about theoretical contribution as the progression of theory maturity. This theorising framework is broad enough to apply to any social science investigation aimed at developing theory, whether empirical or conceptual. This study utilizes a mixed methods approach consistent with both deductive and inductive reasoning. This form of study enables me as a researcher to comprehend complicated events qualitatively as well as via figures, charts, and basic statistical analyses, which is what I will be performing. At the same time, it has the capacity to explain the phenomena of our social world by seeing it through different lenses and by using eclectic approaches that react more effectively to the diverse stakeholders of policy concerns than a single method or approach (Creswell, 1999). This will also be elaborated upon in the chapter on mixed methods sequential explanatory design.

3.2 Data collection

Case studies enable investigators to maintain the complete and significant characteristics of real-world happenings; they are also the ideal technique when "how" questions, such as those raised in this case, are analysed (Yin, 2003). Following that, the data collection process entails collecting, measuring, and assessing accurate data for research objectives using established, verified techniques (Hox & Boeije, 2005).

Yin (2003) discusses three data collection principles that can benefit in demonstrating the construct validity and reliability of case study findings. The first principle is the use of numerous sources, which allows for a more comprehensive examination of historical, psychological, and behavioural concerns. A survey would often favour verbal data over physical measurement or recording of individual behaviour, which is why a triangulation technique is used. The second principle entails developing a case study database, which is concerned with the organization and documentation of data gathered for case studies. This includes notes on case studies, documents, and tabular materials. The third concept is to maintain a chain of evidence, which enables the derivation of any piece of evidence, from the initial research questions to the conclusion. Additionally, this boosts the reliability of the material contained in the case study (Yin, 2003, pp. 97-105).

3.2.1 *Mixed methods sequential explanatory design*

Tashakkori and Creswell (2007, p. 4) broadly defined mixed methods as “research in which the investigator collects and analyses data, integrates the findings, and draws inferences using both qualitative and quantitative approaches or methods in a single study or a program of inquiry”. Mixed methods research has a great significance in determining how and in what way it produces superior insights regarding research challenges than either qualitative or quantitative techniques alone (Tashakkori & Creswell, 2007, pp. 4-5). The phrase "methodological triangulation" also refers to using numerous methodologies to examine a single social issue from different angles. Effective use of various methods, or triangulation, may result in more complex responses to research questions and can assist in overcoming the constraints of particular research methods (Sovacool et al., 2018, pp. 19-20).

While debates continue over the ideal way to adopt mixed methods, the most common technique in practice has been to combine quantitative surveys with qualitative interviews. The justification for combining quantitative and qualitative data within the same research is that neither quantitative nor qualitative approaches are adequate in isolation to capture the

patterns and intricacies of a situation. Sequential explanatory design entails gathering and evaluating quantitative and then qualitative data sequentially inside one single research (Fetters et al., 2013, p. 2136; Ivankova et al., 2006).

There are still significant methodological challenges with performing such a design, this includes deciding the priority or weight given to the quantitative and qualitative data gathering and analysis in the study. Another obstacle is determining the order of data collection and analysis, as well as the stages in the research process at which quantitative and qualitative phases are connected and findings are merged (Ivankova et al., 2006, p. 4). The quantitative survey is the primary objective of this study, followed by the collection of qualitative data via a limited number of interviews.

3.2.2 Survey

To meet the goals of the research, I conducted a web-based survey of farmers' willingness and motivation to adhere to sustainable standards. The questionnaire was partially based on Luhnmann's research and will include questions from this study as well as questions that I have created (Luhmann et al., 2016). After a careful review of Luhmann's survey, I was able to establish which modifications were required to fit Norwegian agriculture and Q-meieriene farmers most effectively.

The questionnaire will be divided into five sections, as seen in appendix A, where firstly socio-demographic characteristics will be gathered through question one and five, such as gender, age and salary. Then in section two, I decided to add an open-ended question: "What comes to mind when you hear the phrase sustainability?" This was done in order to produce a roadmap for the respondents, so that before completing the next questions, they have already formulated some opinions regarding sustainability. In the same, I adopted a question from Luhmann's research to determine their perspectives on sustainability (Luhmann et al., 2016, p. 247). Here, I seek to find out if farmers believe sustainability is necessary, rational, easy to understand, and easy to implement, or vice versa.

The next part focuses on knowledge and optimism towards the Q-meieriene being climate positive by 2030. Section four has a combination of one ranking question, five-point Likert scale questions as well as four-point Likert scale questions. One of the most important considerations that may influence how people react to questions is whether the topic is offered as an open-ended question, where respondents submit a response in their own words, or a closed-ended question, where they are asked to choose from a list of alternatives. Essentially,

a four-point Likert scale is a forced Likert scale. The rationale for the term is because the user is required to provide an opinion. There is no safe "neutral" alternative. Therefore, a four-point answer format is widely preferred when social desirability is expected to influence the construct to be assessed, when subjects' abilities to discriminate between categories are variable, and when a sample of the "population" of farmers must be drawn (Asún et al., 2016).

Question 17 and 18 is also adapted from Luhmann`s study, as these may provide information about the farmers' beliefs, that is if they care about their reputation. Furthermore, for question 18, I hope to determine whether or not the farmers are aware of the common requirements of today's society. The last section has a question asking whether any of the responders are interested in being interviewed. Here, they are requested to provide their contact information so that an interview may be scheduled. There were eleven respondents who provided their contact information, which is a sufficient number of individuals to enable me to get a more comprehensive understanding of certain survey tendencies. What the interviews do not provide, I aim to get by analysing the closed-ended questions in IMB SPSS Statistics (latest version), where I may do further socio-demographic variable analysis and exploratory factor analysis.

3.2.2.1 Pilot survey

I conducted a pilot survey, which is a survey in which I distributed the questionnaire to a sample size that is less than the real target population. By doing so and gathering data from a convenience sample, I am able to forecast participant response patterns and make any necessary adjustments to my survey. Pretesting a survey is a necessary phase in the questionnaire design process in order to examine how individuals respond to the overall questionnaire and specific items, particularly when questions are being presented for the first time.

Following the pilot survey, I also got feedback that the introduction texts might have been a bit more detailed, so this was also adjusted to provide respondents with more information and a clearer image of what I want as a result of their responses. As several of the questions address a sustainability standard, a definition was also included so that respondents would have a clear idea of the concept before responding.

From the results of the pilot survey in question five “How many dairy cows do you have on your farm?”, the number of cows on each farm is more than anticipated. In the pilot survey, the response options were 1 to 10, 11 to 20, and 21 to 30, with 51 to 60 being the

biggest option. Thus, there was a possibility that the majority would choose the final option; hence, the choices were dispersed further and altered.

3.2.3 Interview

In answering the research questions, I also conducted interviews with a number of the farmers who responded to the survey. As the last section of the survey, I allowed participants to give their contact information if they agreed to be interviewed at a later date. This will provide me with further data to support the survey findings and, hopefully, a better understanding of how each farmer views and approaches sustainability. Additionally, they may be able to offer me with a more precise and complimentary response on what Q-meieriene might do to boost their motivation and willingness. In chapter 3.7, a deeper and more detailed explanatory analysis of the qualitative interview will be provided.

The interview data were gathered using semi-structured interviews, which may be thought of as conversations between the researcher and interviewee in which the major themes are selected in advance, but the order employs a blend of close- and open-ended questions. SSIs may be advantageous in cases when, after developing a standardized survey questionnaire, it becomes clear that critical topics cannot be addressed effectively without the addition of additional open-ended questions and longer probing. It is helpful to have a series of questions ready to go, but the order and language of those questions may vary, and I may be encouraged to ask follow-up questions and engage in active listening to go further into certain areas of mutual interest (Adams, 2015).

The interviews were highly useful for gaining an understanding of how farmers perceive and practice sustainability, mostly because they were more eager to provide detailed responses to my questions in the interviews than in the survey. When asked to provide a written response to the question "What comes to mind when you hear the phrase sustainability?", responses varied greatly from person to person. Based on the number of respondents, I did not get as many replies as I desired to this question, hence the use of this question in the interview.

I was able to do nine interviews in all. There were 11 individuals who first expressed interest in being interviewed, however some were difficult to reach. So, after nine interviews, I decided to declare satisfaction since I had gathered a great deal of valuable information for further analysis. The interviews lasted from 10 to 30 minutes. As several of the participants were in remote areas, obtaining their written signatures, which would be required if I chose to

record the interviews, did not appear feasible. Therefore, I decided to take notes throughout the interviews.

3.2.3.1 Pilot interview

During pilot interviews, it is possible and desired to improvise and reason along the way, which cannot be accomplished with published forms. Piloting interviews is essential for testing questions but also allows for gaining interviewing experience (Majid et al., 2017, p. 1073). After the pilot interview, I was also able to assess if further questions should be included.

So, the pilot interview assisted me in determining whether the interview design has defects or restrictions that need alterations to the primary research. During the pilot interview, I improvised the following question: "Have you implemented other sustainable measures or sustainability standards on your farm?". Knowing whether or not a respondent has accepted certain sustainability standards would allow me to analyse not just the survey replies of that particular respondent, but also the interviews that followed. This could also have been selected for inclusion in the survey, because the participants and non-participants in a sustainability standard could have been more precisely defined.

"What can the Q-meieriene do to enhance your motivation and willingness regarding sustainable standards?" was also added after the pilot interview. This item was also included in the survey, but I chose to include it in the interviews as well since some participants did not respond. Similarly for question number six in Appendix A, "What comes to mind when you hear the term sustainability?" The poor response rate was likely affected by the higher-than-anticipated survey dropout rate.

3.3 Research ethics

Human involvement is often used in social research to increase scientific knowledge of social life. Nonetheless, interfering in people's life has the risk of causing them damage (Blaikie & Priest, 2019). The phrase "research ethics" encompasses a broad range of principles, practices, and institutional structures that contribute to the formation and regulation of scientific activity. Research ethics is a practical formulation of scientific morals (De nasjonale forskningsetiske komiteene, 2021). Mutual respect is also important as it is about everyone being respected for who they are and what they offer to the table while establishing access and contacting the respondents. It entails acknowledging and accepting

differences, embracing diversity, and capitalising on common ground but also seeing people's distinct contributions (Seidman, 2006).

The Norwegian Centre for Research Data (NSD) evaluated and approved the thesis proposal, interview guides, and permission forms for this research. The NSD is a national repository for scientific data. They are also there to enable free and simple access to research data and to enhance the environment for empirical research by providing a vast array of data and support services (NSD, n.d.). Before completing my interviews, I was able to design a consent form using NSD that enabled me to educate respondents of their rights and that their personal data would be kept confidential throughout this process. The National Research Ethics Committee for the Social Sciences and Humanities (NESH) has five research ethical rules, one of which specifies that I am accountable to all those who engage in or participate in study. Meaning I must protect human dignity and provide basic equality, freedom, and self-determination for all those who take part in my study. Consent to engage in research with full knowledge is a fundamental premise of research ethics (De nasjonale forskningsetiske komiteene, 2021).

3.4 Validity and reliability

Generally, validity and reliability are regarded as measures for assessing the quality and trustworthiness of scientific research. Validity is the degree to which instruments measure what they purport to measure, while reliability refers to the degree to which measurements can be duplicated (Blaikie & Priest, 2019). Validity and reliability will be assessed in the quantitative part of the study through exploratory and confirmatory factor analyses, as well as by examining composite reliability. In qualitative research, however, the concepts of validity and reliability have been criticised and deemed unsuitable as universal quality indicators. In qualitative research, where the researcher's perspective might dominate the interpretation of the data, the reliability and validity of research studies are especially crucial. It is believed that the researcher must argue for reliability by describing how the data has been created throughout the research process, and for validity by questioning if the conclusions one reaches are legitimate in respect to the reality that has been researched (Morse et al., 2002).

Mixed methods research is used to increase the validity of theoretical hypotheses and to provide a more comprehensive and less biased picture of the phenomena being studied than is feasible with a narrower methodological approach (Ihantola & Kihn, 2011). With data triangulation, any construct validity issues may also be addressed since the numerous sources

of evidence give distinctly two measurements of the same occurrence. A research of case study methodology revealed that case studies that used numerous sources of data were scored higher for overall quality than those that relied only on a single source of information (Yin, 2003, p. 99).

3.5 Exploratory factor analysis

Exploratory factor analysis (EFA) is a statistical technique that improves the conceptual validity and reliability of a scale by discovering factors that may be eliminated. This analysis was conducted to improve the interpretation of the survey's data material. The purpose of factor analysis is to reduce a large number of variables into a smaller number of factors, while collecting data on the interrelationships between a set of variables (Hajji et al., 2021).

3.5.1 KMO and Bartlett's test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,799
Bartlett's Test of Sphericity	Approx. Chi-Square	462,793
	df	78
	Sig.	,000

Table 2 KMO and Bartlett's Test. Retrieved from SPSS.

KMO and Bartlett's are two tests that show whether or not the data may be used for factor analysis. As seen in appendix B, I was able to execute this test using 13 of the 21 survey items: specifically, questions 7 through 11 and 14 through 21. A Bartlett's test was conducted to determine whether there is a connection between the variables in the survey; this should be undertaken prior to a factor analysis to determine whether or not such an analysis is even possible. If there is a correlation, the correlation coefficients in the matrix will be high. If there is no connection between the other variables in the matrix, we have an identity matrix, and the correlation coefficients will be equal to zero or very close to zero, with the exception of the variables that are connected with themselves (Pallant, 2013, p. 199). Bartlett's test gives the p-value shown in Figure 3. SPSS indicates that $p < 0.001$, which is quite low. P is thus less than 0.05, indicating that it is significant. Thus, the null hypothesis can be rejected. The correlation matrix is consequently not an identity matrix, indicating that there is a correlational pattern in the survey.

The KMO is also a pre-requisite that must be met before I can proceed with the factor analysis. KMO will indicate whether the sample size is sufficient to detect a correlation

pattern. The greater the value of KMO and the closer it is to 1, the better. A KMO rating of 0.799 is hence very good. In general, the value should exceed 0.6; if it falls below this threshold, a factor analysis should be deemed unfeasible (Pallant, 2013, p. 191).

3.5.2 Eigenvalues

Now that we know it is possible to extract factors, how many factors can be extracted? Figure 2 depicts "Eigenvalues" and the amount of variance explained by each unique variable. On each variable, respondents can provide a point value between one and five or one and four, or from 100% agreement to 100% disagreement. As a result of the fact that each participant will receive a unique score, there is mention of fluctuation in this scenario. We can extract no more than 13 components, as it was these variables that made it possible to perform the KMO test (Pallant, 2013, p. 199).

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings ^a
	Total	% Variance	Of Cumulative %	Total	% Variance	Of Cumulative %	
1	5,405	41,573	41,573	5,405	41,573	41,573	5,271
2	2,376	18,279	59,853	2,376	18,279	59,853	3,037
3	,917	7,050	66,903				
4	,740	5,692	72,595				
5	,695	5,343	77,939				
6	,605	4,652	82,591				
7	,540	4,153	86,744				
8	,495	3,805	90,549				
9	,355	2,732	93,281				
10	,311	2,390	95,671				
11	,243	1,872	97,543				
12	,197	1,516	99,059				
13	,122	,941	100,000				

Table 3 Total Variance Explained. Retrieved from SPSS.

The objective here is to classify survey variables. If a component has an Eigenvalue of one, it explains the same amount of variance as a single variable. If a factor's "Eigenvalue" is two, it explains as many variables as that factor, and so on. For instance, component 1 in Figure 4 has an "Own Value" of 5.41, which accounts for a total of 41.57% of all variances across all variables. The table indicates the number of factors to be extracted. A typical rule of

thumb for reducing factors is "Kaiser's criteria," which states that any factors with Eigenvalues greater than one should be selected. Factors with "Eigenvalue" greater than one explain more variance than factor one alone, namely factors one through three. To determine whether the total variance explained is sufficient, we must ensure that it is at least 50 percent and these variables account for 59.85 percent of the variance. The total variance explained may alternatively be interpreted as the ability to retain 59.85 percent of the knowledge (Pallant, 2013, pp. 199-201).

3.5.3 Scree plot

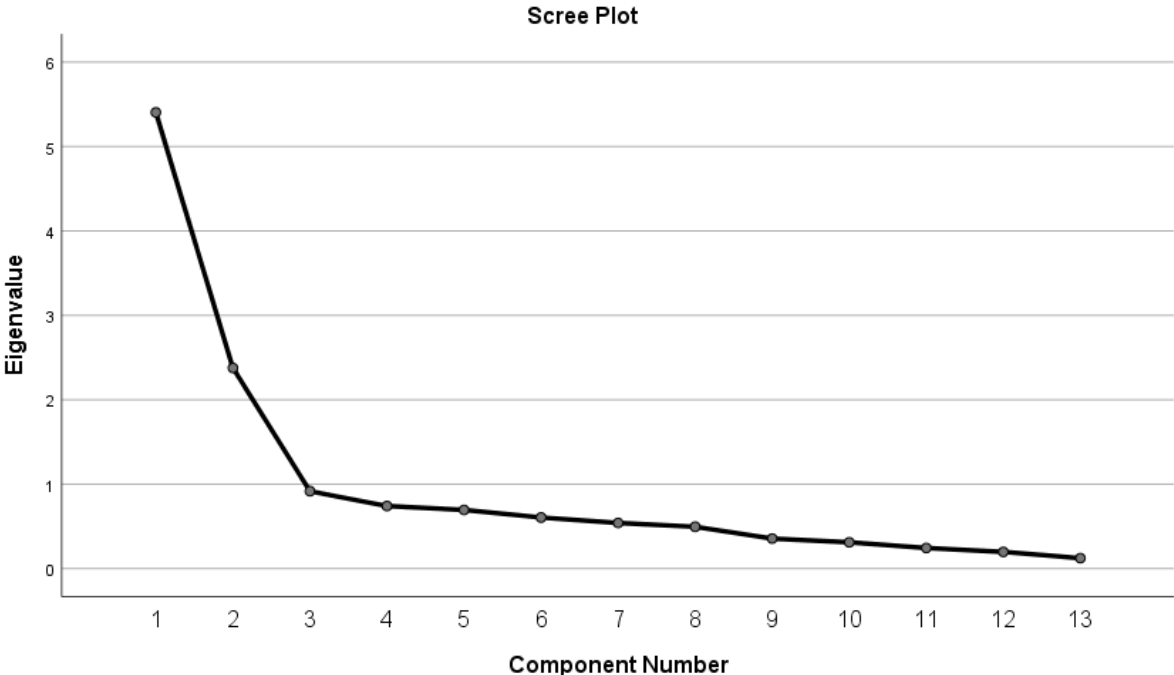


Figure 3 Scree Plot. Retrieved from SPSS.

Examining the scree plot which depicts eigenvalues for each of the factors, will confirm that you are extracting the right amount of factors. The objective is to determine when the curve begins to decline; this point is known as the "Point of inflection". The rule states that all components to the left of the point are those that can be extracted. As seen in Figure 5, I have two factors to the left of the point, as the "point of inflection" factor is not included (Pallant, 2013, p. 191). The scree plot indicates that two factors should be retrieved, which corresponds to the number of Kaiser's criterion, thus I select these two factors.

3.5.4 Oblique rotation

Rotation is intended to make the factors simpler to read and comprehend. Typically, the factors impose differing loadings on the various factors. Consequently, the matrix might be challenging to read; hence, the rotation. This method often modifies the explanatory power

of each variable, but it continues to account for an equal proportion of the variation. On the basis of the SPSS analysis, an oblique rotation with Promax was carried out since it produced a greater correlation between the components (Pallant, 2013, p. 192). Varimax rotation was also examined, but Promax provided higher and fewer loadings, making it the rotation of choice in this factor analysis. I opted to suppress small coefficients with a factor loading below 0.3 throughout the rotation, since this indicates that they have no relationship to the other components.

Tabachnick and Fidell, in Pallant (2013), examine the topic of using smaller samples in factor analyses and conclude that it is reassuring to have at least 300 instances for factor analyses. However, they admit that a lower sample size should suffice if numerous loading marker variables are higher than 0.80, but they advocate examining the matrix for evidence of coefficients bigger than 0.30. Since the pattern matrix indicates that all of my factor loadings are much higher than 0.3, and one of the loadings is also greater than 0.8, I would suggest that there is a solid rationale for doing the factor analysis (Pallant, 2013, p. 190).

The rotation worked out to produce a reasonable distribution among the components, leaving me with two groups. I have decided to label these “sustainability perceptions” and “motivation and willingness”. I've decided to go forward with it since the categories are included in the same planned sections of the survey. As a result, the questions will be suitable to correlate to each other in the same categories in the results and analysis section.

3.6 Confirmatory factor analysis

My research will also include a confirmatory factor analysis (CFA), since the outcomes of the EFA should ideally be validated by a CFA. In fact, it is suggested that researchers should run EFA before to CFA in order to discover cross-loading elements. CFA should thus be used to validate factor structure, while EFA should be used to detect potentially problematic items that may lead to poor CFA fit. Then, researchers must compute AVE and shared variance estimates for each construct (Farrell & Rudd, 2009, p. 5). Consequently, it will be reasonable to calculate factor loadings, composite reliability, and average variance extracted (AVE). In social studies, relative composite reliability is the most widely employed approach immediately after EFA and factors extraction (Hajji et al., 2021). I will be able to compare and examine the results while computing these variables. According to Tabachnick et al. (2007), factor loadings are considered outstanding when (> 0.71), very good when (> 0.63), good when (> 0.55), acceptable when (> 0.43), and poor when (> 0.32).

The factor loadings in this research ranges from 0.60 to 0.88, thus I can conclude that the factor charges on the survey items are all significant.

The "average variance extracted" is a unit of measurement that is calculated mainly to evaluate converged validity. The "average variance extracted" is the average of the factor loadings inside a category; this variable must be determined in order to calculate the composite reliability. For the category of "sustainability perceptions," the AVE was determined to be 0.56, and for the "motivation and willingness" category the AVE was calculated to 0,55. As a general guideline and for adequate convergence, an AVE of at least 0.50 is strongly advised. However, an AVE smaller than 0.50 indicates that your items explain more mistakes than the construct variance. A minimum AVE of 0.50 must be determined for each construct in any measuring methodology (Ab Hamid et al., 2017).

$$\frac{\left(\sum_{i=1}^p \lambda_i\right)^2}{\left(\sum_{i=1}^p \lambda_i\right)^2 + \sum_i^p v(\delta)}$$

Figure 4 Formula for "Composite reliability"

Figure 22 illustrates how composite reliability is computed, which was accomplished by entering the necessary numbers in an Excel spreadsheet. It is suggested that the composite reliability be at least 0.70. A high composite dependability indicates that all of your products consistently measure the same construct. The exploratory factor analysis is a multivariate data analysis technique that requires subjective decision based on expertise such as knowing how many factors to retain. If you fail to make a right decision, this could be a threat for construct validity (Gerbing & Hamilton, 1996). However, in this survey, CR was calculated to range from 0.84 to 0.91. This is a clear indicator that each item measures its relevant construct consistently (Pallant, 2013, p. 7).

3.7 Explanatory analyses

Qualitative data do not give a foundation for considering the severity of various sorts of problems. Neither do they give a basis for determining that particular population groupings possess unique qualities or views. For instance, a qualitative study might serve as a foundation for defining the types of problems encountered and the tactics employed to address them. Using this information, I will do a secondary analysis of qualitative data, which is the utilisation of existing data to obtain answers to research questions that differ from those

posed in the initial research method, namely the survey. Secondary analysis does involve the reuse of qualitative data from prior research studies, such as the responses to the survey's open-ended questions, but I will also add supplementary questions. (Heaton, 2008). So, despite the fact that the qualitative aspect of the study is not the primary emphasis, it is nevertheless essential to examine how qualitative data is handled. In my research, my interviews play a complimentary function; what I want to accomplish is more supportive replies to the survey's open-ended questions, as well as more answers given in response to the survey's less complementary findings.

As qualitative researchers, it is part of our responsibility to have the knowledge and cultural sensitivity to recognise differences in body language during interviews (Parker, 1996). However, I conducted the interviews via telephone due to the fact that some candidates lived in other parts of the country and others had busy schedules, which made a 10-minute interview over the phone optimal for both parties. Telephone interviews have the benefit of allowing me to cover bigger geographical distances rapidly, but they also have the downside of removing the option for visual depiction. Still, the phone interviews take less time, so I will not end up with too much information, making it more difficult to gain an overview (Jacobsen, 2005).

As previously said, I took notes during the interviews, which oftentimes is considered unprofessional. However, taking notes during a research interview guarantees that you capture the accurate details. Taking notes also demonstrates better attention to the person being questioned. Following the interviews, the notes were compared, and the information was accumulated in the same document. This was done to identify repeating themes, delve in depth on individual issues, and evaluate topics across the text. I went through the data material multiple times, looking for specific elements impacting motivation and willingness, as well as ideas on how Q-meieriene may support farmers.

<p>Consent</p> <ul style="list-style-type: none"> - Consent to participate 	<p>The informants right</p> <ul style="list-style-type: none"> - Can withdraw at any time - Does not need to answer questions if they do not want to - Can acquire access to registered information - Can have information erased or amended - Right to submit a complaint
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Motivation and willingness	<ul style="list-style-type: none"> - What comes to mind when you hear the term motivation? - And willingness?
Q-meieriene`s climate positive actions	<ul style="list-style-type: none"> - Did you know that Q-meieriene have a goal of becoming climate positive by 2030? - Does this affect your motivation and willingness going forward? - What can Q-meieriene do to contribute to your motivation and willingness regarding sustainability?
Sustainability perceptions	<ul style="list-style-type: none"> - What comes to mind when you hear the term sustainability? - Have you used the climate calculator from Klimasmart Landbruk yet? Why/why not? - Have you implemented additional sustainable practices or sustainability standards on your farm? - How do you and your farm try to meet the established societal requirements? - How would you want to contribute to the development of a sustainability standard?
Tendencies	<ul style="list-style-type: none"> - Why is financial gain so important? - Beside financial gain, what is your biggest motivating factor for implementing a sustainability standard?
Conclusion	<ul style="list-style-type: none"> - Summary - Any questions? - Or anything you want to add?

Table 4 Translated Interview Guide

The category of motivation and willingness, as seen in the translated interview guide in table four, was about finding out how the respondents interpreted the named phrases. After a few interviews, there were some who struggled a little to comprehend the meaning of those phrases, so therefore I indicated that it could be applied in a sustainability context or in line with them adopting a sustainability standard. Since this was not a question in the survey, I

decided to add it in the interviews to generate a picture of their true comprehension of the phrases, or to see if they got a new understanding of the terms after completing the survey.

The climate-positive measures of the Q-meieriene will also be pertinent to inquire more about from the responders. In addition to asking whether they were aware that the Q-meieriene would be climate positive, I wanted to know if this would influence their motivation and willingness to implement a sustainability standard in the future. As mentioned earlier, question 22 was "What can the Q dairies do to contribute to your motivation and willingness regarding sustainability?" in Appendix A, was added after the pilot interview. And that this was likely owing to the survey abandonment rate, which can be corroborated even further by the fact that this was the final question in the survey and, thus, presumably the question that was seen by the fewest individuals, resulting in a lower response rate.

The perceptions of sustainability category seek to learn more about the respondents' concept of sustainability and how they connect to predetermined societal requirements. The farmers are asked whether they have used the climate calculator for "Klimasmart Landbruk" since the industry's objective is for all farmers to have adopted the climate calculator on their own farms by 2025. The majority of farmers have not yet adopted climate-smart farming practises, despite the fact that agriculture is required under the climate accord to cut greenhouse gas emissions (Klimasmart Landbruk, n.d.-a). This is intriguing since Q-meieriene also envisions completing their targets by 2030, therefore it will be interesting to see how farmers approach adopting measures within certain parameters.

I also chose to add a category with tendencies observed from the questionnaire, whereby financial gain is the prime motivator for most farmers. This is why questioning why financial gain is so essential would be insightful. Primarily to check whether it is true that "jordbruksoppjøret" has impacted the replies to the survey. But also, to acquire an overall view of what is truly contained in what they intend by financial gain. Is it because they are underpaid for the work they do, underpaid per litre of milk, or because investing in a voluntary sustainability standard is too risky given the current state of affairs? It might be a combination of all three possibilities.

While discussing "jordbruksoppjøret" it is quite possible that it has impacted their replies, and it was essential to consider the greater context of the conversation while conducting the interview. This was also crucial since "våronna" was occurring throughout the interview process. "våronna" is the time of year when fields are seeded and readied for the

next growing season. When this season is at its worst, farmers do not have much spare time (NIBIO, 2016). Another reason why finances are so crucial, as revealed by the interviews, is that many farmers have obsolete equipment, tools, and tractors that need to be replaced, and it is therefore a necessity to have the funds to do so before ever considering implementing any sustainability standards.

3.8 Sources of inaccuracy

Inaccuracy cannot be removed entirely, but it may be lowered by recognizing frequent causes of error and using deliberate, thorough procedures. Instrumental, environmental, procedural, and human factors are common causes of error. Depending on how they influence the outcomes, any of these mistakes may be random or systematic. Interviews, for example, may provide insight into how individuals talk about certain topics, but can they provide insight into what they actually do in the real world, and, more importantly, why they do what they do? How should we, as social scientists, respond to what our informants say? When questioning, the link between the informants' credibility and the research's credibility appears to be more intense, and they may hide or refrain from providing information when asked questions about sensitive topics.

The explicit provision of a middle response alternative significantly improves the number of respondents who express a neutral stance. This propensity may even be heightened when inquiries include sensitive subjects. Thus, Si and Cullen (1998) reveals when respondents are presented with an explicit midway response choice, they are more likely to pick a middle response category. As such, it is necessary to be aware that this may be the case for some of the survey questions which employs the 5-point Likert scale.

4.0 Findings

The findings of the survey and interviews will be presented, debated, and evaluated in this chapter. The first section contains the survey's demographic results, which are exclusive to the quantitative portion of the research. The following parts will include both quantitative and qualitative data from the survey and interviews. The titles of the sections are derived from the survey categories, and the implied organisation of the titles is also based on the factor analysis. All findings will be linked to my problem statement; “How can Q-meieriene collaborate with the dairy farmers to apply a sustainability standard on their dairy farms?”, to generate a comprehensive picture for further interpretation and analysis.

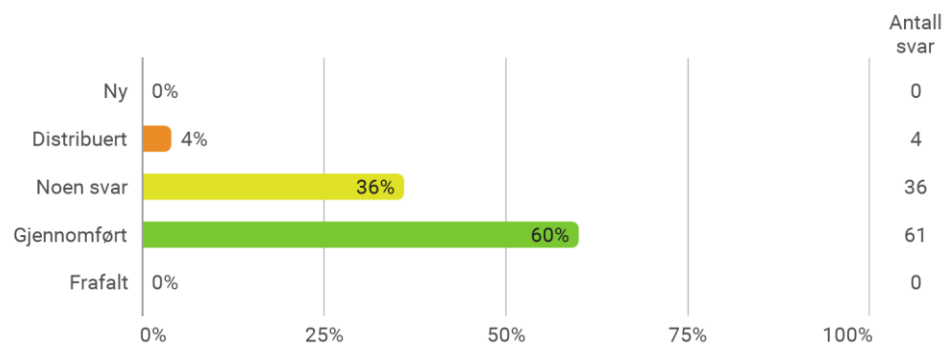


Figure 5 Overall participation status

For the overall participation status, I will consider the completion rate and survey dropout rate. Figure six indicates that sixty percent of respondents completed the whole survey. It also tells that 36 of the participants answered just some of the questions, giving me a dropout percentage of 36 percent. The replies indicate that the age range between 20 and 29 has the greatest survey dropout rate. This may occur for a variety of reasons, such as technical challenges while responding, but I believe this is not suitable for the age group of 20 to 29. However, it may be due to a lack of interest, time, motivation, or resources to complete my survey.

The table in Appendix E provides a summary of the number of replies, mean values, and standard deviations for the vast majority of item questions. Question 6 and 22 was omitted since it required a written response. Question 13 was also omitted due to a more comprehensive analysis using Kendall's W Test.

4.1 Demographic findings

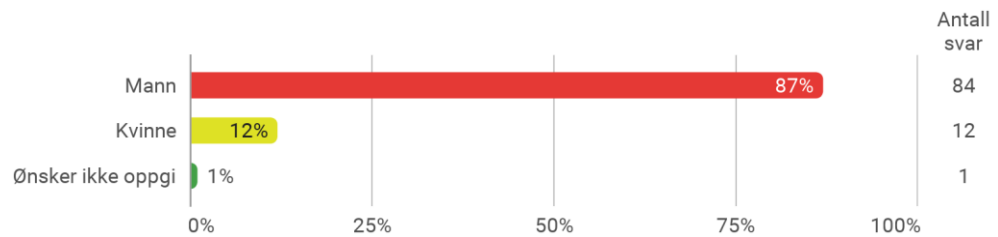


Figure 6 What is your gender?

The first graph illustrates an unequal distribution of men and women. Statistical research at Statistics Norway reveals that females account for 17% of all private farmers. While the proportion of female farmers has climbed annually over the last quarter-century, there are no more female farmers now than there were in 1999 (Statistics Norway, 2021). Despite the fact that this is still a male-dominated field, it is males who are leaving the field. This is because the number of farms in Norway is decreasing rapidly. In 1999, there were 69,951 active farmers; by 2020, that number had decreased to 36,691 (Martinsen, 2022).

Despite this, Haugen and Brandth (1994) once disclosed that women are evolving more like men. Young women farmers have the same motivation, credentials, and attitude to farming as their male counterparts. Young women operate farms of the same scale as their male counterparts. As the responsible operators of farms, they must oversee all activities, even those that have historically been considered the realm of men. In this way, they have dismantled the old patriarchal division of work between men and women in agricultural families.

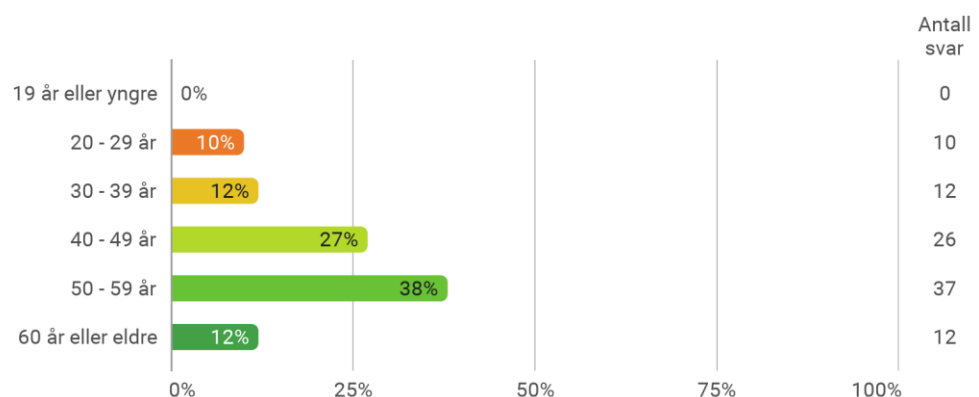


Figure 7 What is your age?

Over the last two decades, the average age of a farmer has risen by four years, from 48 to 52. This is consistent with the response, since the majority of responders are between the ages of 50 and 59. Despite a decline in the number of farmers, the percentage and number of elderly farmers are growing. In 10 years, the overall number of farmers has decreased by little over 7,500, while the number of farmers over the age of 70 has climbed by 1,900. In 10 years, the share of older farmers has increased from just under three percent to just under nine percent (Landkreditt, 2021).

Young farmers vary from older farmers in ways that are indicative of a new trend and not just a natural life cycle impact. Younger farmers have often obtained agrivocational training, whilst more experienced farmers have gained agricultural expertise via years of experience. The heart of this transformation is a shift from seeing farming as a way of life to viewing it as a profession. Typically, younger farmers become farmers out of choice and passion, whereas elderly farmers become farmers due to marriage and necessity (Heggem, 2014).

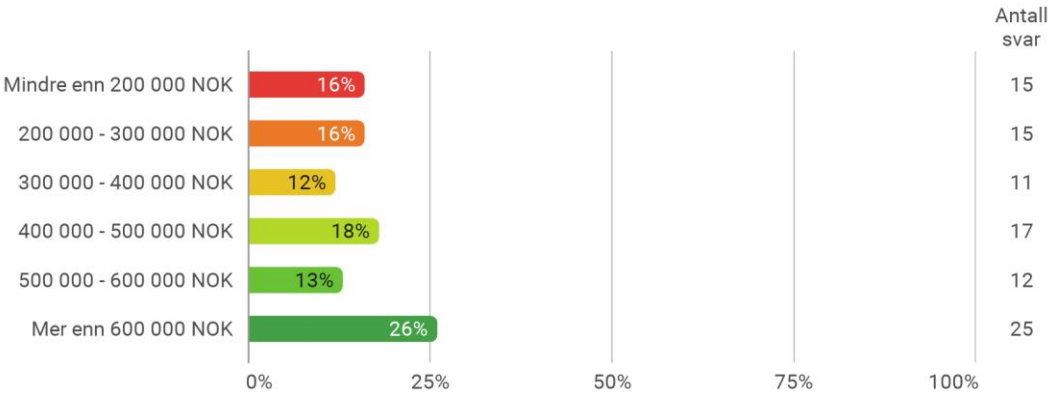


Figure 8 What is your annual income?

According to Statistics Norway, the average annual wage income for a farmer is 308 500 Norwegian kroner (Statistics Norway, 2022). Yet, the revenue level of farms in agriculture varies widely, but is generally low. Also, as seen in appendix E, the mean is 3.75 and the standard deviation is 1,822, which is the highest overall. A large standard deviation suggests that the data are more dispersed, as seen in Figure 6. From 2014 to 2017, agriculture has had an increase in income of 55 100 Norwegian kroner per man-year, or 18.1%, whilst other groups have experienced a growth of 35 400 Norwegian kroner per man-year, or 7.1%. This is something the government cannot claim credit for, namely because eighty percent of income increase is attributable to labour productivity growth, i.e., the farmer's ability to do more in less time, and low interest rates (Norges Bondelag, 2017).

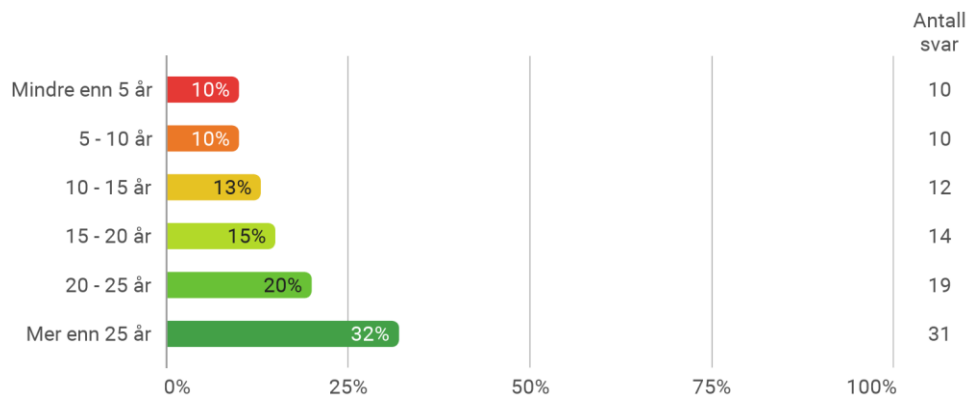


Figure 9 How many years have you worked as a dairy farmer?

As a farmer, you will in most instances be self-employed and own and operate on your own farm. However, more than half of Norwegian farmers also have other employment. The primary reason for this is because the salary is inadequate (Klingenberg, 2012). However, for many, leaving the farm is not an option since the economics ties them to it. This may explain why the majority have been dairy farmers for more than 25 years. The fact that respondents may have two or more occupations might also have an effect on their yearly income, since dairy farming could then be one of numerous sources of income. In recent years, farmers have invested millions of Norwegian kroner. For instance, a new free-range barn, a milking robot, a milk quota, and sufficient soil to feed their animals. They cannot just abandon the production, but also animals, and seek normal employment. For many, this is due to the debt the farmers are carrying, and the “jordbruksoppgjøret” is an essential key term here. Numerous farmers have made substantial expenditures in structures, land, and machinery. In order to simplify processes and comply with new regulations. As of 2034, stanchion barns are no longer regulated by legislation. According to farmer's groups, there are continuously fresh needs, but insufficient funds to meet them. The difficulty is that what farmers produce does not always justify the costs (Aglen, 2021).

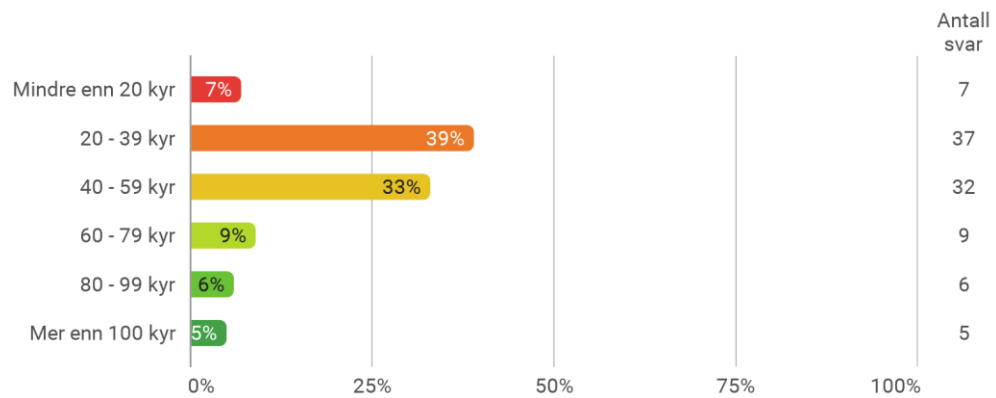


Figure 10 How many dairy cows do you have on your farm?

There are around 6,900 dairy farms in Norway, with an average of 30 cows per farm. 59 percent of Norwegian farms have less than 30 cows, and as seen in Figure 11, which illustrates that 39 percent of farmers from Q-meieriene have somewhere between 20 and 39 cows (Melk.no, 2022). Thus, we may also conclude that the answer is reliable.

4.2 Sustainability perceptions

The exploratory factor analysis generated a group for sustainability perceptions; thus, it is practical to present the findings using the same groupings. To assist farmers in transitioning to more sustainable production standards, it is necessary to comprehend how they view the concept of sustainability as it applies to their own farms. Sustainable perception refers to an individual's assessment or appraisal of environmental difficulties, or to an event based on personal experiences and attitudes toward particular environmental situations (Lin et al., 2021).

Despite the fact that some of these farmers are not technically familiar with the idea of sustainability, their replies enabled me to understand and get an overall picture of their sustainability-related reality. A proportion of responders demonstrate a firm grasp of the sustainability's constituent elements, including climate, environment, health, and economics. Also stating that we must use natural resources in an environmentally appropriate way. And that we must consider the effects of our actions on future generations.

A minority of respondents believe that sustainability is the most abused term to ever exist, but they are not alone. According to King (2013), the word "sustainability" should be banned from both technical and political discourse. Sustainability, per the Oxford English Dictionary, is "the quality of being sustainable." It also defines "sustainable" as "able to endure," which should motivate us all to pursue sustainability; consider the alternative:

"unsustainable." Any activity, from a single company to an entire economy, that is not sustainable will cease. The idea here is that talking about sustainability is not as important as beginning to take responsibility for our resource and energy use, for social development, for the health of our economy, and to save our essential biosphere (King, 2013).

From society's point of view, milk production has a relatively positive image, which is also what some of the respondents believe. Also, that the dairy sector is not so bad that it may be portrayed in the media at times, and that the farmers think that when academics use the word sustainability, they describe something that they have been doing for years. According to them agriculture is built on photosynthesis, which is the most sustainable thing there is, and if the farmers had been permitted to cultivate industrial hemp for their own fuel, they might probably have been greenhouse gas negative. This is also backed by researchers from across the globe who are attempting to determine how photosynthesis may be used most effectively to store carbon in soil and plants and to replace oil, coal, and gas with agricultural and forestry (Jortveit, 2018).

On a five-point Likert scale, respondents were asked to establish an opinion on sustainability through four questions. The first question is whether or not sustainability is necessary, ranging from not necessary to necessary. In this instance, 37 percent of respondents said that sustainability is necessary, which I may read as a recognition from the farmers that being sustainable might have a positive impact on the planet. Then, 56 percent of respondents believe that sustainability is somewhat rational or fully rational. One approach to comprehend why they feel sustainability standards are rational is to consider their motivations to act. In response to the question of whether sustainability is simple or difficult to understand, the majority of respondents were neutral, while the remainder agreed that it is easier than it is difficult. This suggests that there is some willingness and knowledge, but there is still a long way to go in terms of sustainability knowledge. 46 percent of respondents indicate that implementing new sustainability standards is either extremely difficult or fairly difficult. This is likely due to the respondents' lack of confidence in their expertise and financial resources to adopt sustainable standards.

4.3 Q-meieriene`s climate positive actions

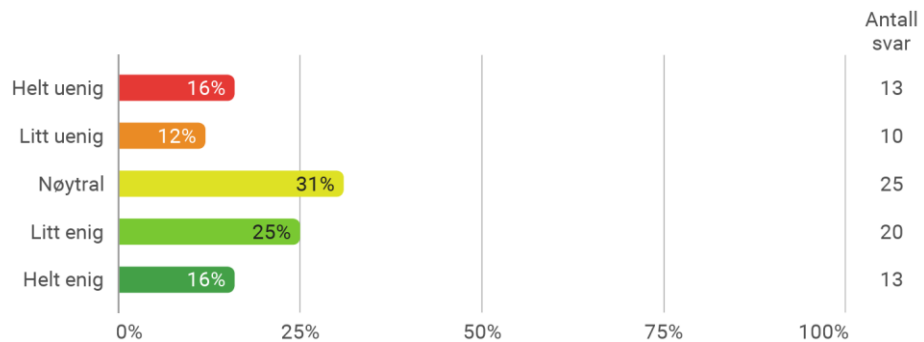


Figure 11 I consider Q-meieriene`s attempt to become climate positive as positive.

When asked whether they consider Q-meieriene's effort to be climate-positive as favourable, the greatest number of responses are neutral. In this instance, farmers likely do not see climate change negatively, but are more concerned with their already hectic workdays and the possible benefits of a prolonged growing season (Brobakk, 2017). Some respondents also revealed that they feel that Q-meieriene are only putting on a show to boost their company's reputation by attempting to become climate positive. They also express uncertainty as to how it would be able to enact by the year of 2030.

It is no secret that businesses are under pressure to reduce their environmental effect as the demand for green goods increases. In addition, the emphasis on sustainable investments is presently recognised as a global megatrend. In the future, however, businesses that do not prioritise sustainability may be barred from doing business and find it more difficult to market their goods. In addition, obtaining finance will be more difficult and costly since banks would put a risk premium on businesses without a sustainability evaluation. Thus, farmers may perceive the value of Q-meieriene becoming climate-positive in the future or long term (Knudsen, 2019).

The question in figure 11, “I consider Q-meieriene`s attempt to become climate positive as positive”, could have been phrased better. In retrospect, I believe that should have been an open-ended question. Because this forces the participant to engage with the phrase positively as something to be accepted or rejected and may not represent language or concepts held by your topic. By changing the word allows the participants to respond and opens up the dialogue to follow-up questions (Seidman, 2006).

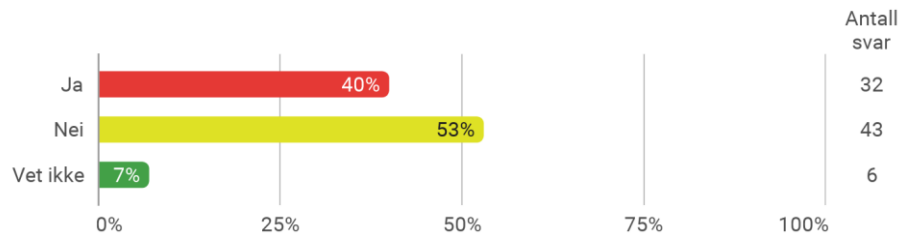


Figure 12 Did you know that Q-meieriene has a goal of becoming climate positive by 2030?

Figure 10 demonstrates that nearly half of respondents were aware that Q-meieriene will be climate positive by 2030. Nevertheless, the interviews revealed that a number of respondents replied affirmatively since they were informed about it via that as well, although they were unaware of this fact until the survey was conducted. This may be the result of response bias, which is the phenomenon in which survey respondents do not give you the whole truth while answering your questions. Typically, this occurs because queries are framed in a certain manner, or because a particular answer is seen more socially acceptable (Ochoa, 2018).

4.4 Motivation and willingness

In order to determine which variables may impact the motivation and willingness to engage in a VSS, the survey's multiple-choice questions pose social and attitude-related issues and tie the responses to the likelihood of a certain response. Usually, ordinal scale answers to single attitude questions are selected as psychological variables, as was done in a previous study of Greiner (2015) to highlight attitudinal implications on choice.

Respondents were provided with a Likert scale of objectives, in Question 13 of appendix A, to rank the key motivations for establishing a sustainability standard on their farms. With the first being the most important and the last being the least. There were five motivators to pick from: financial gain, climate and environment, social responsibility, participation in an endeavour that offers personal meaning and context and doing so as a response of the acts of others. The Kendall's W statistic may be derived from this data. As shown in appendix E, we have statistical significance at 0.00 and our cut-off is 0.05; thus, we reject the null hypothesis that the distributions of these five variables are identical. If the test statistic W equals one, all respondents to the survey agreed and ranked the list of motivators for adopting a sustainability standard in the same order. If W is 0, there is no significant pattern of agreement among respondents, and their responses may be regarded as essentially random. The Kendall's Coefficient of Concordance was calculated to be 0.494, indicating that

there is about as much agreement as unpredictability in the respondents' responses (Legendre, 2005)

The five groups' mean rank was also determined using the Kendall's W test, and the results are provided in appendix D. This will indicate which of the groups had the greatest overall rank, as measured by the highest score on the continuous variable. An examination of the mean rankings for the various groups indicates that financial gain had the greatest score, while doing so as a response of the acts of others got the lowest score.

So, for many farmers, economics seems to be the driving factor behind their motivation and willingness in agricultural situations. One respondent said that they can only be encouraged to improve operations and adopt environmental and sustainability initiatives if the industry is financially incentivized. They will want compensation for their work, as would be the case in all other sectors. Therefore, farmers are particularly driven by financial rewards. These findings are also supported by Luhmann's research, in which the current literature regarding the financial motive as a primary incentive for farmers to engage in a sustainability commitment is identified as a major factor (Luhmann et al., 2016, p. 252). This could also be based on the neoclassical economic theory that farmers are profit maximisers and will therefore adopt a different land use practise or participate in an agri-environmental schemes if the conservation payment is high enough to compensate for opportunity and transaction costs and deliver a financial advantage (Greiner, 2015, pp. 154-155).

There is an environmental technology program from Innovation Norway which offers subsidies for the creation, pilot, and demonstration of novel environmental technology. One respondent was among the first to obtain this subsidy for installing solar panels that cost up to 500,000 Norwegian kroner. This relates to creative goods or techniques that address an environmental issue. Environmental technology encompasses climate-related solutions, such as renewable energy and energy efficiency. It comprises emission-free transportation options, energy storage and energy systems, and water and air purification technologies (Innovasjon Norge, 2022a). This is pertinent since it may represent an option that other farmers are unaware of. Farmers have the chance to get financial assistance through this initiative in Innovation Norway, whereas up to 35 percent of the approved cost estimate may be covered by grants for investments in permanent facilities and accompanying permanent production equipment (Innovasjon Norge, 2022b).

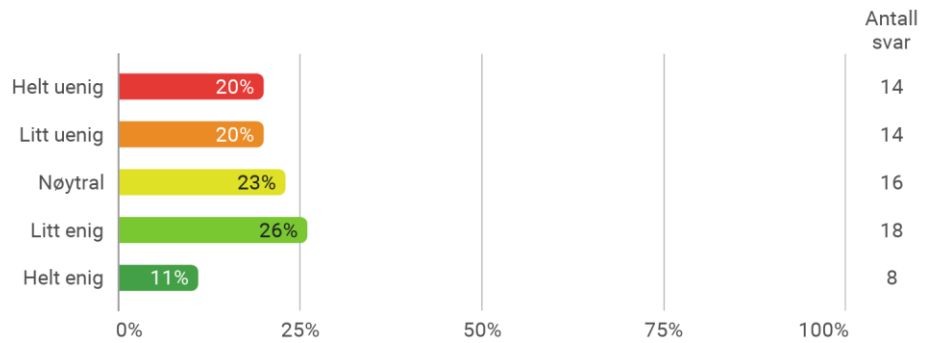


Figure 13 The image of agriculture can be improved through a sustainability standard

If agriculture's image might be enhanced by a sustainability standard, there is a pretty uniform distribution of agreement, as seen in Figure 14. However, the interviews found that favourable publicity is seen as advantageous for the agriculture business. In fact, a company's image may be enhanced by socially responsible activity, which seemed to be the case more often. The dilemma can strike in both directions, either enhancing the company's image, which may lead to greater demand for its goods, or a company's lack of social responsibility, which is brought to the attention of consumers, can result in a weaker reputation and decreased demand for the company's products. Essentially, CSR might be intended to be selfless, charitable, and only for the sake of the environment, without regard for profit. On the other side, an enhanced favourable reputation is likely to result in financial gains for the business (Carroll, 2008).

With locally sourced food and effective use of our resources, the farmers still feel like they can achieve sustainability, despite the widespread perception that the agriculture industry has a negative reputation. However, disinterested social responsibility still offers businesses the chance to donate their resources to society on a non-remunerated basis. This is something that could also enhance their image as dairy producers

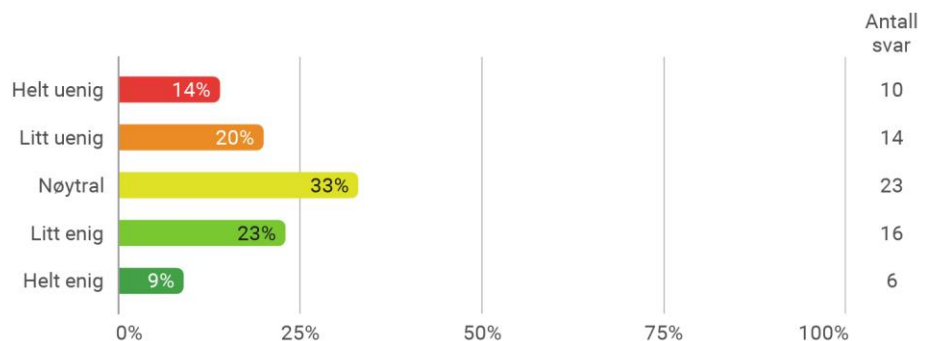


Figure 14 A sustainable standard becomes essential because of societies' requirements

In figure 12, one-third of respondents had opted for neutrality; this result from the study left me very unsure why. Initially, this gave me the idea that the majority of respondents are oblivious of their society's sustainability requirements. However, in interviews, both climate positivity and climate neutrality were cited as descriptions of some of the social requirements imposed on Norway, and some of the interviewees were confused of the notions' meanings. Therefore, it gives me the impression that some of the farmers has little understanding of what this genuinely entails, both in terms of the specified conditions and their true significance.

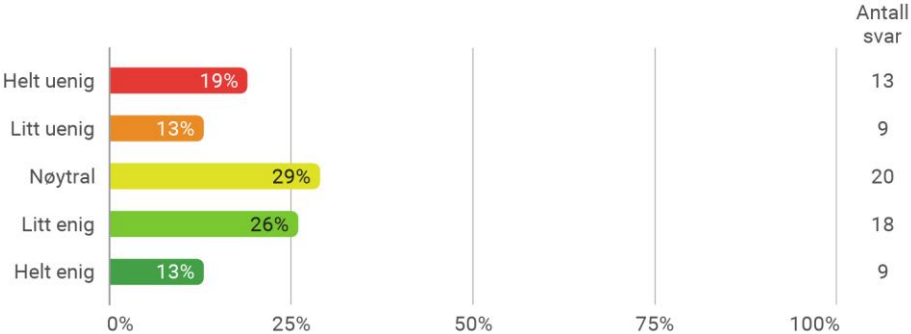


Figure 15 Knowledge of sustainability would increase my willingness to introduce a sustainability standard

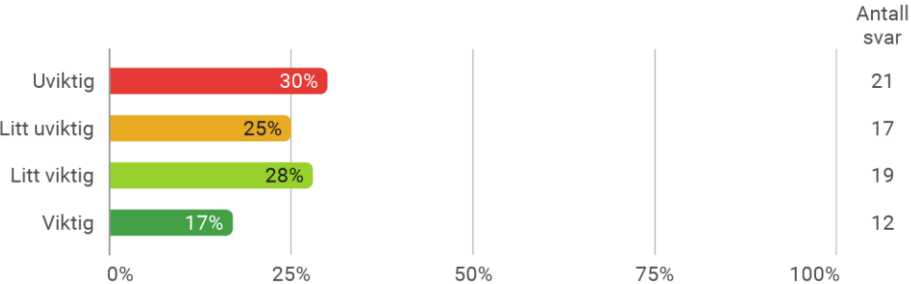


Figure 16 How important is it that Q-meieriene creates skill groups that can provide you with knowledge about sustainability?

Although knowledge may help to the improvement of the agriculture industry's image, respondents did not fully agree, in figure 13, that it would boost their willingness to adopt a sustainability standard. Thus, there was a larger consensus among interviewees that knowledge might contribute positively, and some wished that Q-meieriene could help with this via talks or meetings, which, according to them, most definitely would boost both their motivation and willingness surrounding sustainability standards. Despite the fact that the interviews confirmed this, 55% of respondents in Figure 14 believed that the notion that Q-meieriene could give skill groupings was either insignificant or rather unimportant.

One of the most important things that Q-meieriene could do to enhance motivation and willingness among farmers is to simplify the concept of sustainability, according to one of the respondents. This pertains to educating farmers on what the different measures or standards imply, as well as including them in the process of finding effective solutions.

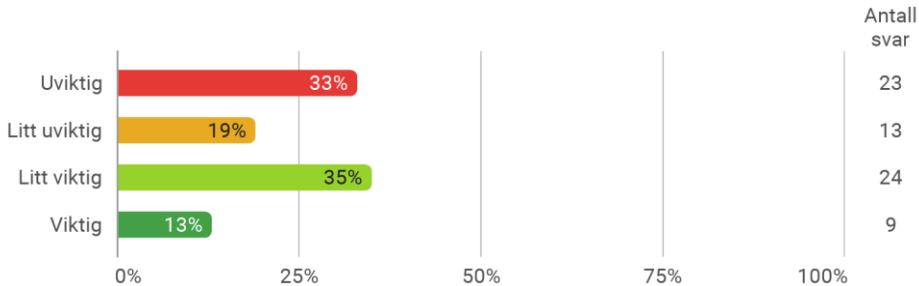


Figure 17 How important is it that Q-meieriene establishes a measuring parameter that you as a farmer could use?

50 percent of respondents feel that a measurement parameter is important, as seen in figure 15, whereas the remaining 50 percent say that a measurement parameter is unimportant. This measurement parameter may be compared with Klimasmart Landbruk climate calculator. The majority of interview respondents had not yet used the climate calculator. Some said it was too difficult and that there was not enough time throughout the days to utilise the calculator.

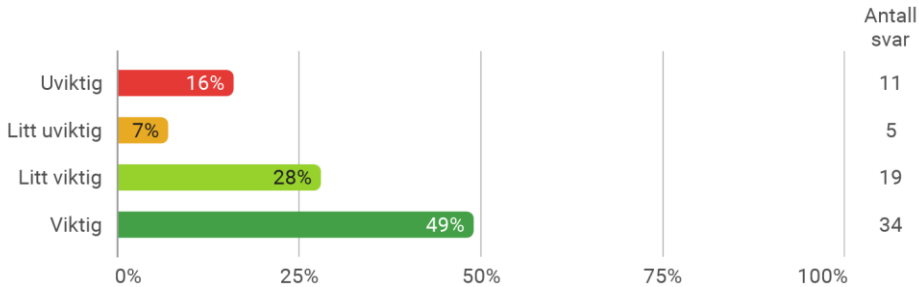


Figure 18 How important is it for you as a farmer that Q-meieriene give support to new sustainable measures at your farm?

The older the respondents, the more vital it was for them to have Q-meieriene`s support for new sustainable initiatives. Several times every year, food chains raise their prices, yet the price paid to farmers remains relatively consistent. Consequently, an ever-decreasing proportion of value creation is returned to the farmer, which bears the biggest share of expenditures; this may explain why support from Q-meieriene is so important to them (Lindin, 2022).

Ultimately, a financial reward would be a significant incentive for farmers who are less motivated to apply a sustainability standard, in particular. When creating a standard, dairies should consider this key motivation. Norwegian government may also encourage a

commitment to sustainability, for instance by providing funding to enhance the sustainability of dairy products. A sustainability standard would be advantageous being if it had the potential to enhance dairy producers' financial status.

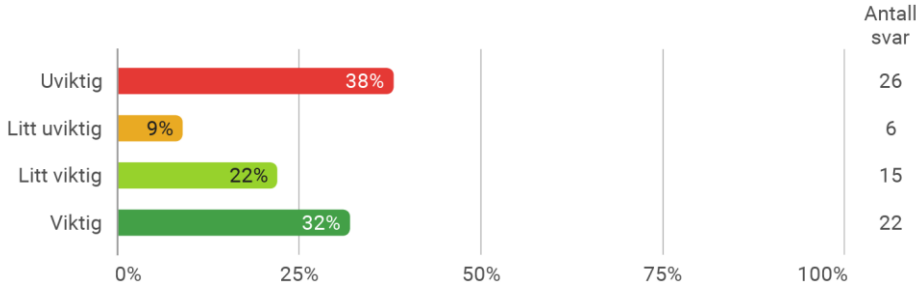


Figure 19 How important is it that Q-meieriene introduce an incentive or bonus for farms who achieve the sustainability targets first?

According to Figure 17, it seems that the majority want an incentive for the first farm or farms to achieve sustainable objectives. This point is important because, if the agreement was substantial, it is evident that a potential reward would impact their motivation to perform more sustainable actions. The financial risk for farmers who make substantial initial investments in a project is very considerable, and they are requesting improved and more accessible risk mitigation tools, such as incentive programmes. Consequently, they also need a business assistance programme that may facilitate the essential piloting of new sustainable technical solutions to a larger degree (NHO, n.d.).

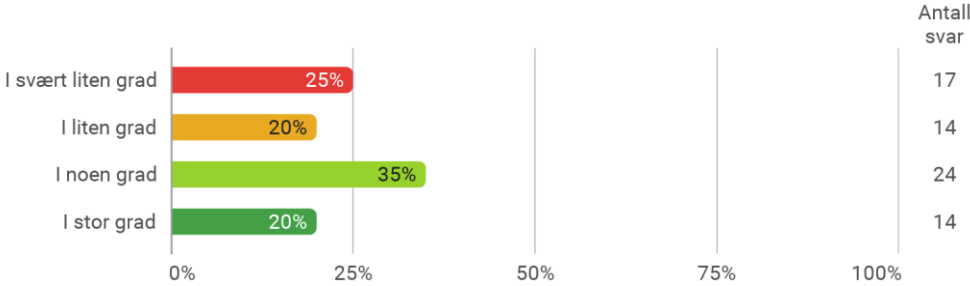


Figure 20 To what degree would you wish to be engaged in the creation of sustainability standards as a farmer?

Farming is a multi-functional and multi-tasking enterprise that entails more than providing food and fibre for profit, as shown by farmers' different knowledge requirements and incentives to learn. However, both farmers and other stakeholders engaged in knowledge development and dissemination prioritise these diverse knowledge requirements differently, which is why being engaged in the creation of such sustainability standards would be so

beneficial. Figure 20 demonstrates that 55% of respondents wish to be engaged in the creation of a sustainability standard in some level.

Technical and marketing expertise are quite adequately addressed, but other knowledge requirements get far less consideration. Farmers use and integrate knowledge from a variety of sources to satisfy their diverse knowledge requirements. In many instances, farmers' expertise was the most prominent and reliable source of information since it is seen as locally relevant and significant. In their day-to-day operations, farmers depend mostly on the practical knowledge they have gained, sometimes over lengthy periods of time, via doing, experimenting, and watching (Šūmane et al., 2018). Also, farmers have a greater understanding of what they are cultivating and what best suits them as farmers and their animals.

5.0 Discussion of main findings

In this chapter, results will be related to the theoretical and analytic framework's perspectives. There will be a discussion which is organised in accordance with the research questions stated in the introduction chapter. Luhmann et al. (2016) results will also play a significant role in the discussion, as it does in other sections of my analysis.

5.1 Which factors impact farmers' willingness and motivation to accept a sustainability standard?

What factors impact farmers' willingness and motivation to embrace a sustainability standard is one of two sub research questions in this study. To avoid irreversible harm to the natural system, it is necessary to influence and modify consumer and producer behaviour, which may be accomplished, among other things, by the introduction of voluntary sustainability standards.

The technology acceptance model also examines technological processes such as voluntary sustainability standards and explains how “people form attitudes and intentions toward trying to learn to use the new technology prior to initiating efforts directed at using” (Seidman, 2006). It is said that a farmer will make a cognitive decision and form a bias without ever interacting with a piece of technology, implying that they are bringing certain attitudes with them and are looking at aspects such as ease of use and usefulness of that technology, as well as if they can make it work for them. And all of this occurs prior to motivation and willingness to use VSSs; here, attitudes have already been formed that impact the decisions farmers make in their daily life. The climate calculator is a good example here since, according to some respondents, it is not very simple to use, and therefore the perceived ease of use influences the perceived usefulness, which in turn affects the attitude toward using. So, because using the climate calculator requires a login and registration of data from the farm, the farmers perceived it as a lengthier process and thus was disparaged in everyday life, and that the behavioural intention is affected and likely will not change before an official requirement to use the climate calculator is implemented.

The findings did however reveal that farmers are generally willing to implement a sustainable standard on their farm. In contrast, the shift in attitudes toward a sustainability standard could be attributed to the impending climate crisis and a steady stream of negative headlines about the general state of the planet, more companies, such as Q-meieriene are speaking out about their contributions to the great struggle to ensure that the earth remains a liveable place. This

change in attitudes towards a sustainability standard might also be due to the ongoing debate on sustainability and corporate social responsibility and the growing concerns in the broader society concerning animal welfare standards in intensive livestock farming, which also affect dairy farms (Luhmann et al., 2016, p. 251).

Carroll (1991) pyramid of responsibility places financial accountability at the apex, with the corporation ensuring the most effective application of available resources. Carroll asserts that corporations were established as economic entities to give products and services to members of society. This is also evident in the most influential factor on farmers' motivation and willingness, which, according to my findings, is financial gains. So, when seen as distinct concepts CSR is often regarded to be concerned with social concerns, while sustainability is concerned with environmental ones. If Q-meieriene actively engages farmers in their CSR strategies aimed at enhancing environmental sustainability throughout the production–consumption chain and throughout society, it has the potential to influence and involve farmers in initiating environmental changes at not only economic, but also policy and societal levels (Thongplew et al., 2016). Furthermore, profitable operations may give Q-meieriene with the freedom to embrace social responsibility if it is a component of company management. In addition to financial and legal obligations, social responsibility is not mandated by law but is recommended (Standard Norge, 2021).

Hannus et al. (2020, p. 2) analysed the influence of farmers' expectations, such as financial benefit or prior knowledge, on their stated willingness to accept such a standard. His findings divided respondents into two groups, with the first describing economic rewards resulting from process improvements and the second describing economic rewards resulting from higher gains, indicating the impact of process improvement on the intention to use sustainability standards for the first time. As a result, process improvement must continue to persuade farmers of the relative benefits of voluntary sustainability standards. What the farmers would benefit from is that a voluntary standard would avoid many breaches that cost farmers money and others that are cost neutral; it would also prevent other transgressions that benefit farmers financially in the near future, for the long-term benefit of promoting farmer compliance (Ayres & Braithwaite, 1992, p. 106). So, once again, it is confirmed that a VSS can actually contribute financially on a farm, which is likely something that the farmers are unaware of - this brings us back to the fact that knowledge is a factor that would most likely affect their motivation in a situation where they were told that they could save revenue.

The social theory of Pierre Bourdieu is used to examine how the embodied discourses and practises of “stockmanship” change as new technology are brought into agricultural systems. This is essential because fast technological progress in livestock agriculture necessitates considerable changes in the knowledge and abilities required of farmers, resulting in circumstances in which the interactions between humans and nonhuman animals are fundamentally renegotiated. Within the field defined as Norway's dairy sector, the individual dairy farm may be portrayed as a social unit expressing a collective goal connected to an external environment comprised of multiple organisations. Bourdieu “attempts to decipher the social logic of group-specific tastes, dispositions to act in a certain way under given circumstances, lifestyles and habits existing alongside each other within the social space”, collating them under the broad concept of everyday culture, which lends itself well to studying farmers and their actions. The field is regarded as a social area where participants (individuals or groups) are positioned according to their available resources. The significance of such an approach stems from Bourdieu's emphasis on the social context in which power relations internal and external to the farm are formed, reproduced, and challenged. Our use of Bourdieu's notions assists in situating individuals within the context of their dairy farm, the Norwegian dairy sector, and the relationships that exist between stock people, their animals, and technology. To implement a VSS, a farmer needs to implement or invest in it; however, in order to operate it efficiently and productively, as well as to create and be a part of a more sustainable production, the farmer must draw on historically acquired experiential knowledge as well as a willingness to create and transform the field in which they are situated (Glover, 2015).

Finally, in order for Q-meieriene to enhance farmer support, it will be imperative to understand the type of farmers with whom they are working with. As a result, comparing Luhmann's categories with my findings will be quite valuable. Firstly “half-hearted sustainability proponents” are unsure about a sustainable standard, which is something that is perceptible in my research. The farmers can see using a standard, but they are uncertain whether it is necessary. Even when financial incentives are available, they have a low motivation to engage in a standard, which a small number of respondents also disclosed, but not enough to classify the farmers in this research as half-hearted sustainability proponents (Luhmann et al., 2016).

Respondents who identified as "highly dedicated sustainability proponents" had an internal drive to implement a sustainability standard since they said that they would do so

even if it meant paying additional costs. Farmers in this group are indifferent about their intrinsic or monetary motivation to carry out a standard, and they have a negative attitude toward a lenient sustainable standard. This contradicts my results since majority said that they would have established a sustainability standard as long as it did not include additional expenditures or unpaid labour. As a result, we have "profit-oriented sustainability refusers," who would likewise reject to adopt a standard if it included expenses but would be extremely driven to do so if there were financial incentives for doing so (Luhmann et al., 2016).

5.2 How can Q-meieriene work to enhance farmer support of a standard?

The shift towards more standardised agricultural information and knowledge demonstrates that the transition to more sustainable agriculture requires a new knowledge base, with new content and forms of knowledge, as well as new learning techniques (Šūmane et al., 2018). This is something Q-meieriene may be prepared to support by, mainly since they have opted to integrate farmer emissions in their value chain and want to achieve a climate positive organisation by 2030.

There is this fundamental topic of how far firms should be held accountable to larger stakeholders, whereas differing perspectives on CSR has been prevalent. This dispute has carried on for years, with some arguing that a company's obligation is exclusively to its shareholders. Glavas' approach to stakeholder theory, on the other hand, is one that incorporates the interests of all constituents, not just shareholders, into decision-making. As a result, the link to CSR is logical, since if the definition of stakeholders is enlarged to encompass all stakeholders who affect the company and vice versa, then society and the environment become intrinsic to the theory. Arguably, if firms fully followed this method to ensuring the well-being of stakeholders, CSR would be unnecessary (Glavas & Fitzgerald, 2020).

Q-meieriene might utilise incentives to persuade important stakeholders, such as farmers, to operate in line with a certain objective, such as being climate positive by 2030. Extrinsic motivation is described as the pursuit of an instrumental objective; it refers to external motives for a person to act in a certain way, such as financial incentives. Extrinsic motivation seems to be what drives the farmer the most, rather than intrinsic motivation, which is that they do something for their own reason. This is also shown when participation in an endeavour that provides personal purpose and context was ranked fourth on the list of factors motivating farmers to implement a sustainability standard. However, extrinsic incentives may

reduce a farmer's satisfaction of participation in a sustainability standard. As a consequence, intentions must be considered in order to express the driving elements that influence an action; they might therefore be indicators of how hard dairy farmers are willing to try, or how much effort they want to put in to achieve a certain behaviour. In general, the higher the desire to participate in an action, the more probable its performance (Ajzen, 1991). So, while determining how high an incentive should be to effectively drive a shift to sustainable behaviours, it is desirable to create a balance between how strong the incentive must be to pique the farmers' interest in participating in the action of sustainability standard.

Stakeholders should embrace the company's commitment to environmental sustainability and its goals, while also having a say in the company's future path, which is currently not the case for Q-meieriene's farmers. Again, this is likely because many people are unaware of the aims that Q-meieriene has set for themselves as a corporation. A growing role of stakeholders in sustainable development is to scrutinise a company's strategies and recognise that sustainability might still be profitable while causing significant environmental damage (Carroll, 1991). Q-meieriene must also pass this on to their farmers, merely motivating them to adopt more sustainable choices and stating that it does not need to be a high or costly investment. So, while incentives is already cited as a motivating factor, respondents reveal in interviews that Q-meieriene can improve its ability to encourage other measures. The measures in consideration may be up to Q-meieriene because several of the farmers are unsure or lack knowledge, so they will most likely draw inspiration from what is presented to them.

The Norwegian Storting's objective of creating competition on the dairy market that "gives the farmer real alternatives for the sale of milk and contributes to product development and better selection for consumers, increased value creation and sales for Norwegian milk" is not even close to being achieved. In the dairy sector, competition is so poor that Tine has accounted for as much as 95% of milk collection on occasion. Since then Q-meieriene have increased their market share to 28% in 2021, while Tine continues to account for considerably over half the market (Hopland, 2021). As Foros et al. (2020) argues increased competition and innovation in the dairy industry may be vital for securing improved pay and jobs for farmers. When a single corporation controls a considerable percentage of a vital primary resource, such as milk, it is difficult to establish effective and enduring competition, according to evidence from other marketplaces (Foros et al., 2020, p. 32).

Q-meieriene must assume responsibility for the future preservation of Norwegian agriculture and recruitment of new farmers. In today's market, barely 10% of Norwegian farmers are under the age of 40. The future of Norwegian food production is dependent on us bringing in new, younger individuals with thorough knowledge. In Norway, there is a history of personal ownership, with the farmer owning and operating the farm. This organisation is responsible for the country's variety of small and big farms. Agricultural properties are not like other types of properties. They guarantee that one of the population's basic requirements is addressed, and the Licensing Act is society's mechanism for controlling who owns these assets and whether they are utilised for food production. The Licensing Act also assures that agricultural assets have a steady price development, allowing young people to join the industry, have long-term resource management, and a stable workplace on the farm (Norges Bondelag, n.d.-b).

5.3 Reflections

Since Luhmann's research is such a big component of my research, I have opted to reflect a bit on my findings in relation to Luhmann's results. According to Luhmann, it is of importance to establish which elements have the biggest impact on farmers' motivation and the adoption of a sustainability standard in dairy as well as in other agricultural subsectors. According to my research, the major incentive or motivation of the participants is financial gain, but they are also concerned about protecting the environment and their animals.

Collecting demographic data is necessary for drawing more accurate inferences about people's experiences and habits, and if I were to do the survey again, I would likely have requested additional demographic information. I believe it would have been much easier to assess which farmers identify with which factors. For instance, I would inquire as to which dairy they supply milk to, Jæren or Gausdal. As Jæren is a lot bigger dairy, it may have an effect on the farmers who reside on Jæren, as there are more operations and events that may engage the farmers. I would also inquire about their marital situation and degree of education, since these factors are explored in contemporary ideas about farm traditions, acquired knowledge, and whether or not a farmer is motivated and willing to become more sustainable.

The questions in Luhmann's survey does make it simple to evaluate whether a responder is impacted by intrinsic or extrinsic motivation, as well as how they perceive usefulness and ease of use from the technology acceptance model. This makes the work of Luhmann et al. (2016) a valuable resource for future study. As a result, I realise that I could have gained even more insight from Luhmann's survey, given that the questions are written in

a way that makes categorising them easier while keeping respondents from recognising that we would be attempting to categorise them.

After completing the data collection, I discovered that there was a final agreement in "jordbruksoppgjøret" that guarantees a 10.9 billion Norwegian kroner revenue rise for farmers. When conducting the research, Luhmann was also confronted with the existing state of the milk market in Germany. As a result, he believed that this core motivation of financial gain should be considered by dairies when creating a standard. The Norwegian "jordbruksoppgjøret" is a prime example of how a political commitment to sustainability may be bolstered by the provision of financial assistance to enhance the sustainability of dairy products. Namely because a sustainability standard would be advantageous if it had the potential to enhance dairy producers' financial status (Luhmann et al., 2016). And this is precisely what may occur now that farmers have received this income rise and will be fully compensated for the high expenses of fertiliser this year and next. On this basis, it is anticipated that my study has provided farmers with a greater understanding and appreciation of sustainability, and that the rise in revenue gives them with a real chance to explore adopting voluntary sustainability standards. Through one of the interviews, one of the farmers was able to express that they are extremely pleased with the outcome of the settlement and that others who would continue to criticize are merely doing so for the sake of criticizing.

6.0 Conclusion

This study was conducted to determine what factors influence farmers' motivation and willingness to implement sustainability standards, as well as what Q-meieriene may do to increase their support towards their farmers. Farmers from the Q-meieriene have provided me the chance to investigate this topic using a combination of quantitative and qualitative approaches. This is significant because Q-meieriene have a goal of being climate positive by 2030, and the farmers' climate accord to reduce CO₂ emissions by 10 percent is insufficient if Q-meieriene are to continue to integrate farmers' emissions in their value chain.

The farmers of Q-meieriene are focused with breeding for improved animal health and performance. They are also well aware of that if soil well-drained, fertilised efficiently, and harvested at the optimal time yields provides nutritious crops this is something that would be economically beneficial and minimise greenhouse gas emissions. Actually, most farmers are aware that sustainability encompasses climate, environment, health, and the economy, and that for anything to be sustainable, the environment must be as little impacted by human activities as possible. Despite this understanding, there is a great deal of discontent with the phrase, with many arguing that it is misused, politically correct, and an academic term that captures what farmers have been doing for decades.

Farmers of Q-meieriene are generally supportive of the introduction of a sustainability standard, voluntary or not. But still, the adoption of sustainability standards also shows that farmers are hesitant to alter their production practises to be more sustainable due to the high perceived economic risks involved. Also debatable is farmers' willingness to pay more than they think it is worth for sustainability standards, which may be another reason why farmers are more inclined to keep their present, although in many instances less sustainable, production techniques. This indicates that motivation and willingness increase when the cost of the sustainability standard decreases and the work force simultaneously lowers. Meaning that they are mostly governed by extrinsic motivation, as external circumstances tend to boost their motivation. At the same time, farmers exhibit a degree of scepticism, indicating that they see adaptation to new climate policies as more difficult than actual climate change.

It is believed that engaging stakeholders is essential to making sustainability more appealing to farmers. This is also confirmed by interviews with several responders who wished to participate in the creation of a sustainability standard. Those that did not wish to do so believed the younger farmers could take responsibility for this process. On this basis, Q-

meieriene are able to facilitate the recruitment of competent and sustainability-minded farmers. It is also believed that farmers recruited from agricultural families will have different experiences, attitudes, and motives in agriculture than newcomers. This is derived from the notion that farmers with distinct habits assess their prospects differently. Thus, education, new or alternative productions, life experience, and production cultures could identify the causes and grounds for how sustainable the agricultural production is for each farmer.

This study provides a deeper understanding of farmers' decision-making processes by examining the numerous factors that influence their motivation and willingness to adopt sustainability standards. Complex and rigid measures, such as legislation, are less motivating and more expensive for farms than simpler, voluntary approaches to sustainability such as the Innovation Norway project that encourages voluntary installation of pure photovoltaic systems. In such instances, Q-meieriene may help in explaining what actual support schemes exist for farmers, as well as aid in the process of information and proposal exchange so as to enhance their motivation hopefully even more.

Through using technology acceptance model (TAM), ease of use is an additional factor that is crucial to farmers. The perceived utility and perceived usability of the climate calculator, for instance, were poor, which diminished the farmers' intent to use. If farmers could learn and be informed that applying a voluntary sustainability standard does not cost as much as they assume, it is probable that ease of use would have the biggest impact on their willingness and motivation.

I conclude that the motivation and willingness of farmers to embrace a sustainability standard are acceptable but could well be improved. Process optimization or financial incentives have a considerable influence, but do not seem to be essential for promoting the intent to implement sustainable standards. Q-meieriene requires supplementary support, implying that a combination of policy instruments is more successful than a single policy strategy. Farmers seem to be mostly driven by extrinsic motivation, but Q-meieriene could contribute to the improvement of knowledge amongst the farmers which again could lead to enhanced intrinsic motivation.

6.1 Future research

For further research, I have only researched one industry in one country, thus caution is required when extrapolating its findings to other decision contexts. Due to the very small sample size, the survey is not representative of the entire population of dairy farmers, nor even of all dairy producers in Q-meieriene.

A detailed examination of the farmers' survey responses reveals a substantial standard deviation for nearly all survey questions, indicating that farmers cannot be considered a homogenous group. However, in any regard, it is feasible to develop an overall picture of the elements that increase motivation and willingness for farmers when it comes to sustainability standards, to the extent that this presumably applies or at least relates to the farmers who did not respond to the survey.

The factor analysis demonstrated that the survey is valid and reliable. As attitudes towards motivation and willingness around sustainability are constantly changing, it would be appropriate to collect data over a longer period than we have been able to. Then possibly once and again a year later to determine if attitudes have changed, motivation and willingness have increased, and the number of farmers embracing sustainability standards has increased. Given the ambiguity surrounding some of the remarks made in the interview it is crucial to constantly disseminate knowledge about sustainability standards so that knowledge about the topic is reached out to as many farmers as possible.

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Appendices

Appendix A – Questionnaire

Mitt navn er Marte Sunde, og denne undersøkelsen blir utført som en del av masteroppgaven min innenfor Energi, Miljø og Samfunn.

Jeg håper å få svar på følgende spørsmål: "Hvordan kan Q-meieriene samarbeide med melkebøndene for at de anvender en bærekraftsstandard på melkegardene sine?". Nærmere bestemt vil jeg vite hva som påvirker deres villighet og motivasjon til å implementere eller akseptere bærekraftige tiltak på nettopp deres gård.

Jeg vil gjøre deg oppmerksom på at denne undersøkelsen er helt anonym, og håper dermed du vil svare så ærlig og konkret som mulig. Undersøkelsen vil ta rundt 10 minutter.

Takk på forhånd!

1. Hva er ditt kjønn?

- (1) Mann
- (2) Kvinne
- (3) Ønsker ikke oppgi

2. Hva er din alder?

- (1) 19 år eller yngre
- (2) 20 - 29 år
- (3) 30 - 39 år
- (4) 40 - 49 år
- (5) 50 - 59 år

(6) 60 år eller eldre

3. Hva er inntekten din per år?

(1) Mindre enn 200 000 NOK

(2) 200 000 - 300 000 NOK

(3) 300 000 - 400 000 NOK

(4) 400 000 - 500 000 NOK

(5) 500 000 - 600 000 NOK

(6) Mer enn 600 000 NOK

4. Hvor mange år har du jobbet som melkebonde?

(1) Mindre enn 5 år

(2) 5 - 10 år

(3) 10 - 15 år

(4) 15 - 20 år

(5) 20 - 25 år

(6) Mer enn 25 år

5. Hvor mange melkekyr har du på gården din?

(1) Mindre enn 20 kyr

(2) 20 - 39 kyr

(3) 40 - 59 kyr

(4) 60 - 79 kyr

(5) 80 - 99 kyr

(6) Mer enn 100 kyr

6. Hva tenker du når du hører ordet "bærekraft"?

7. "Etter min mening er bærekraft ...":

(1) Helt unødvendig (2) Litt unødvendig (3) Nøytral (4) Litt nødvendig (5) Helt nødvendig

8. "Etter min mening er bærekraft ...":

(1) Helt irrasjonelt (2) Litt irrasjonelt (3) Nøytral (4) Litt rasjonelt (5) Helt rasjonelt

9. "Etter min mening er bærekraft ...":

(1) Veldig vanskelig å forstå (2) Litt vanskelig å forstå (3) Nøytral (4) Litt lett å forstå (5) Veldig lett å forstå

10. "Etter min mening er bærekraft ...":

(1) Veldig vanskelig å forstå (2) Litt vanskelig å forstå (3) Nøytral (4) Litt lett å forstå (5) Veldig lett å forstå

innføre

innføre

innføre

innføre

I 2019 satt Q-meieriene et mål om å bli klimapositiv innen 2030, og startet arbeidet med å identifisere de største utslippkildene.

85% av Q-meieriene sitt utslipp kommer fra råvareproduksjon, blant annet fra melkekyrne. Derfor ses dette på som et viktig innsatsområde, da konkurransen i markedet er tøff og alle vil ha lavest mulig klimaavtrykk.

11. Jeg ser på initiativet til Q-meieriene om å bli klimapositive som positivt.

- (1) Helt uenig
- (2) Litt uenig
- (3) Nøytral
- (4) Litt enig
- (5) Helt enig

12. Visste du at Q-meieriene har et mål om å bli klimapositive innen 2030?

- (1) Ja
- (2) Nei
- (3) Vet ikke

En bærekraftsstandard kan sees på som en måte for både melkebønder og meierier å oppnå konkurransefortrinn og tilfredsstillende behovene til interessenter. Det kan også forklares som frivillige retningslinjer som brukes for å demonstrere din forpliktelse til økonomi, miljø og sosiale forhold, samt matsikkerhet.

Q-meieriene overveier og utvikler bærekraftsstandarder for klimautslipp - derfor vil jeg gjerne vite hvordan din motivasjon og villighet vil være til en slik standard.

13. Hva er de viktigste motivasjonsfaktorene for å innføre en bærekraftsstandard på din gård?

Ranger fra 1 til 5, hvor 1 er mest viktig og 5 er minst viktig.

- Økonomisk gevinst
- Klima og miljø
- Samfunnsansvar
- Du tar del i noe som skaper personlig mening og sammenheng
- Du gjør det fordi andre gjør det

14. Landbrukets "image" kan forbedres gjennom å innføre en bærekraftsstandard.

- (1) Helt uenig
- (2) Litt uenig
- (3) Nøytral
- (4) Litt enig
- (5) Helt enig

15. En bærekraftsstandard vil være viktig på grunn av satte samfunnskrav.

- (1) Helt uenig
- (2) Litt uenig
- (3) Nøytral
- (4) Litt enig
- (5) Helt enig

16. Kunnskap om bærekraft ville økt villigheten min til å innføre en bærekraftsstandard.

- (1) Helt uenig
- (2) Litt uenig
- (3) Nøytral

- (4) Litt enig
- (5) Helt enig

17. Hvor viktig er det at Q-meieriene utvikler kompetansegrupper som kan gi deg kunnskap om bærekraft?

- (1) Uviktig
- (2) Litt uviktig
- (3) Litt viktig
- (4) Viktig

18. Hvor viktig er det at Q-meieriene utvikler en måleparameter som du som bonde kan følge med på?

(Måleparameter = suksessfaktor i forhold til målbare bærekraftige tiltak)

- (1) Uviktig
- (2) Litt uviktig
- (3) Litt viktig
- (4) Viktig

19. Hvor viktig er det at du som Q-bonde får støtte fra Q-meieriene til nye bærekraftige tiltak på din gård?

- (1) Uviktig
- (2) Litt uviktig
- (3) Litt viktig
- (4) Viktig

20. Hvor viktig er det at Q-meieriene innfører en belønning eller bonus til de gårdene som når de bærekraftige målene først?

- (1) Uviktig
- (2) Litt uviktig
- (3) Litt viktig
- (4) Viktig

21. I hvilken grad vil du som bonde bli involvert i utviklingen av bærekraftsstandarder?

- (1) I svært liten grad
- (2) I liten grad
- (3) I noen grad
- (4) I stor grad

22. Hva er da det viktigste Q-meieriene kan gjøre for deg for å øke motivasjon og villighet til å innføre en bærekraftsstandard?

Om du er villig til å stille til et eventuelt intervju i ettertid, hadde jeg satt pris om du ville lagt igjen kontaktinfo under her. Vil da informere om at personopplysninger holdes konfidensielt, og de vil slettes etter ferdig oppgave.

Appendix B – Interview guide

<p>Samtykke</p> <ul style="list-style-type: none"> - Samtykke til deltakelse 	<p>Informantens rettigheter</p> <ul style="list-style-type: none"> - Kan når som helst trekke seg - Trenger ikke svare på spørsmål - Kan få innsyn i registrert informasjon - Kan få slettet eller rettet på informasjon - Rett til å sende klage
<p>Motivasjon og villighet</p>	<ul style="list-style-type: none"> - Hva tenker du når du hører ordet motivasjon? - Og villighet?
<p>Q-meieriene</p>	<ul style="list-style-type: none"> - Visste du at Q-meieriene har et mål om å bli klimapositive innen 2030? - Påvirker dette din motivasjon og villighet? - Hva kan Q-meieriene gjøre for å bidra til din motivasjon og villighet angående bærekraft?
<p>Bærekraft</p>	<ul style="list-style-type: none"> - Hva tenker du når du hører ordet bærekraft? - Har du tatt i bruk klimakalkulator fra Klimasmart Landbruk? Hvorfor/hvorfor ikke? - Har du implementert andre bærekraftige tiltak eller bærekraftsstandarder på gården din? - Hvordan forholder du og din gård seg til de satte samfunnskravene?
<p>Tendenser</p>	<ul style="list-style-type: none"> - Hvorfor er økonomisk gevinst så viktig? - Foruten økonomisk gevinst, hva er den største motivasjonsfaktoren din for å implementere en bærekraftsstandard? - Hvordan ville du blitt involvert i utviklingen av en bærekraftsstandard?
<p>Avslutning</p>	<ul style="list-style-type: none"> - Oppsummering - Noe du lurer på? - Eller noe du vil legge til?

Appendix C – Pattern Matrix

Pattern Matrix ^a

	Component	
	1	2
7. ""Etter min mening er bærekraft ..."":		,658
8. ""Etter min mening er bærekraft ..."":		,782
9. ""Etter min mening er bærekraft ..."":		,780
10. ""Etter min mening er bærekraft ..."":		,772
11. Jeg ser på initiativet til Q-meieriene om å bli klimapositive som positivt.	,600	
14. Landbrukets ""image"" kan forbedres gjennom å innføre en bærekraftsstandard.	,606	,346
15. En bærekraftsstandard vil være viktig på grunn av satte samfunnskrav.	,819	
16. Kunnskap om bærekraft ville økt villigheten min til å innføre en bærekraftsstandard.	,766	
17. Hvor viktig er det at Q-meieriene utvikler kompetansegrupper som kan gi deg kunnskap om bærekraft?	,759	
18. Hvor viktig er det at Q-meieriene utvikler en måleparameter som du som bonde kan følge med på? (Måleparameter = suksessfaktor i forhold til målbare bærekraftige tiltak)	,715	
19. Hvor viktig er det at du som Q-bonde får støtte fra Q-meieriene til nye bærekraftige tiltak på din gård?	,756	

20. Hvor viktig er det at Q-meieriene innfører en belønning eller bonus til de gårdene som når de bærekraftige målene først?	,711	-,305
21. I hvilken grad vil du som bonde bli involvert i utviklingen av bærekraftsstandarder?	,883	

Extraction Method: Principal Component Analysis.

Rotation Method: Promax with Kaiser Normalization.

a. Rotation converged in 3 iterations.

Appendix D – Statistics from survey

	Statistics		Mean	Std. Deviation
	Valid	Missing		
1. Hva er ditt kjønn?	97	4	1,14	,382
2. Hva er din alder?	97	4	4,30	1,156
3. Hva er inntekten din per år?	95	6	3,75	1,822
4. Hvor mange år har du jobbet som melkebonde?	96	5	4,20	1,721
5. Hvor mange melkekyr har du på gården din?	96	5	2,84	1,217
7. ""Etter min mening er bærekraft ..."":	81	20	3,63	1,373
8. ""Etter min mening er bærekraft ..."":	81	20	3,63	1,188
9. ""Etter min mening er bærekraft ..."":	81	20	3,12	1,269
10. ""Etter min mening er bærekraft ..."":	81	20	2,57	1,036
11. Jeg ser på initiativet til Q-meieriene om å bli klimapositive som positivt.	81	20	3,12	1,288
12. Visste du at Q-meieriene har et mål om å bli klimapositive innen 2030?	81	20	1,68	,609
14. Landbrukets ""image"" kan forbedres gjennom å innføre en bærekraftsstandard.	70	31	2,89	1,314
15. En bærekraftsstandard vil være viktig på grunn av satte samfunnskrav.	69	32	2,91	1,172
16. Kunnskap om bærekraft ville økt villigheten min til å innføre en bærekraftsstandard.	69	32	3,01	1,300
17. Hvor viktig er det at Q-meieriene utvikler kompetansegrupper som kan gi deg kunnskap om bærekraft?	69	32	2,32	1,091

18. Hvor viktig er det at Q-meieriene utvikler en måleparameter som du som bonde kan følge med på? (Måleparameter = suksessfaktor i forhold til målbare bærekraftige tiltak)	69	32	2,28	1,069
19. Hvor viktig er det at du som Q-bonde får støtte fra Q-meieriene til nye bærekraftige tiltak på din gård?	69	32	3,10	1,100
20. Hvor viktig er det at Q-meieriene innfører en belønning eller bonus til de gårdene som når de bærekraftige målene først?	69	32	2,48	1,290
21. I hvilken grad vil du som bonde bli involvert i utviklingen av bærekraftsstandarder?	69	32	2,51	1,080

Appendix E – Mean Rank from Kendall`s W Test

Ranks

	Mean Rank
13. Hva er de viktigste motivasjonsfaktorene for å innføre en bærekraftsstandard på din gård? Ranger fra 1 til 5, hvor 1 er mest viktig og 5 er minst viktig. - Økonomisk gevinst	1,31
13. Hva er de viktigste motivasjonsfaktorene for å innføre en bærekraftsstandard på din gård? Ranger fra 1 til 5, hvor 1 er mest viktig og 5 er minst viktig. - Klima og miljø	2,81
13. Hva er de viktigste motivasjonsfaktorene for å innføre en bærekraftsstandard på din gård? Ranger fra 1 til 5, hvor 1 er mest viktig og 5 er minst viktig. - Samfunnsansvar	3,09
13. Hva er de viktigste motivasjonsfaktorene for å innføre en bærekraftsstandard på din gård? Ranger fra 1 til 5, hvor 1 er mest viktig og 5 er minst viktig. - Du tar del i noe som skaper personlig mening og sammenheng	3,41
13. Hva er de viktigste motivasjonsfaktorene for å innføre en bærekraftsstandard på din gård? Ranger fra 1 til 5, hvor 1 er mest viktig og 5 er minst viktig. - Du gjør det fordi andre gjør det	4,37

Appendix F – Test Statistics from Kendall`s W Test

Test Statistics

N	70
Kendall's W ^a	,494
Chi-Square	138,206
df	4
Asymp. Sig.	,000

a. Kendall's Coefficient of Concordance