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- Organic products: Consumers' subjective and objective knowledge -

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## Abstract

The purpose of this master thesis is to investigate and examine how consumers' objective knowledge about organic products in terms of nutrition, environment, and taste, differ based on their preference for and subjective knowledge about organic produce. The study was conducted on Norwegian consumers, as the research aims to capture information from the general consumer to draw a conclusion about the Norwegian population.

The thesis is conceptualized by building upon literature about organic products and production methods. Thus, this thesis will contribute with an understanding of Norwegian consumers knowledge regarding organic products and production methods and how this is affected by Norwegian consumers preferences. The main study was based on an online survey with 405 participants. Participants were sampled using a convenience and snowball sampling method and a descriptive, quantitative research design was used to test our hypotheses. Findings from the study identified a knowledge gap in consumers' mind regarding the topic as well as it discovered that people with the strongest preference and highest subjective knowledge of organic produce and production method overall had the lowest objective knowledge among the sample. Thus, consumers should be more informed about organic food before making daily purchasing decisions.

*Keywords: Norwegian population, organic production, taste, environment, food miles, sustainability, animal welfare, nutrition and vitamins, subjective knowledge, objective knowledge, and consumer preference.*

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We would like to take this opportunity to express our gratitude and thank supervisor Erik Olson from the marketing department at BI for effective supervision, interesting conversations and countless guidance from the beginning to the end of our master thesis process.

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Finally, we would like to thank all the participants that took part in the study.

Sincerely,  
Martina Nicole Næss  
Ingrid Marker

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## 1.0 Introduction to Research Topic

Stanford Scientists Cast Doubt on Advantages of Organic Meat and Produce - *New York Times* headline.

*“When we began this project, we thought that there would likely be some findings that would support the superiority of organics over conventional food,” ... “I think we were definitely surprised.”* Bravata (2012), cited in Chang (2012).

The Norwegian Government with new strategy for organic production – shall meet consumers’ demand.

*“In this year’s agricultural settlement the parties have agreed on increasing the focus and commitment to organic farming of NOK 9.2 million, which makes a total provision for organic production of NOK 171.8 million.”* Regeringen (2018).

In the marketplace, the demand for organic products has increased during the last decade, and this trend is expected to continue in the future (Stortinget, 2017; Olson, 2017; Honkanen, Verplanken, & Olsen, 2006; FBIL, 2017). Companies have seen that the market for organically produced goods has increased substantially, and an increased number of households choose organic products when purchasing groceries (Ngobo, 2011). This trend has made organic a “hot” topic among researchers. Researchers have observed a shift in consumer trends in the recent years; thus, the food that used to satisfy basic physiological needs such as hunger and nutrition has now become a source of pleasure and identity in terms of social status (Vittersø & Tangeland, 2015; Batson, 1998 cited in Fiske, Gilbert, & Lindzey, 1998, p. 282-316; Griskevicius, Tybur & Van den Bergh, 2010).

In line with this shift in market trend and consumer behavior, the Norwegian government continuously focus on improving the organic agriculture, much because of the increasing demand from consumers, due to the assumption of its better health, taste and environmental protection (Regjeringen, 2018). As a result of the differentiated food market and government support, Norwegian grocery stores now offer a wide range of food with different quality and prices making it easier for consumers to purchase organically produced food.



According to Honkanen et al. (2006) and Vittersø and Tangeland (2015), as stated in Olson (2017, p. 1007), organic food can be defined as:

*“...use of raw materials and farming methods that are in balance with natural environmental systems, which more specifically means production without bioengineering and man-made pesticides, herbicides, fertilizers, hormones, and antibiotics”.*

In essence, organic produce is food that is produced without the use of man-made fertilizers.

Even though organic food has become a consumer trend, both in Norway and other developed countries, empirical studies show that organic food is generally not healthier (Olson, 2017), does not taste better (Hughner et al., 2007; Olson, 2017), and, has mixed environmental benefits (Cassman & Hendrix, 2007; Seufert, Ramankutty, & Foley, 2012; Olson, 2017). Despite this, there is still a high demand for organic food in the market in Norway (Regjeringen, 2018). Thus, researchers are concerned with questions such as: Is organic food healthier?, Does it taste better?, Is it better for the environment?, How sustainable is it?, and What are the benefits of purchasing organically produced food? Based on these questions and the mixed evidence in the literature, there are reasons to believe that knowledge about organic products varies between groups of consumers.

### ***1.1 Contribution and Research Question***

After reviewing the literature on the research topic, we found limited prior scientific studies on Norwegian consumers evaluating the level of knowledge on the given topic and how this reflects their attitudes and preference for purchase. After contacting Matmerk, Debio, Norwegian University of Life Science and “Landbruks- og Matdepartementet”, which are all involved in the development of organic food in Norway, we found that they would value more information about Norwegians knowledge, behavior and attitude regarding organic produce. Accordingly, this information could be valuable for farmers, grocery chains, and politicians. Hence, this master thesis extends beyond the literature on the given topic.

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In addition, we found that this is also an attractive topic from a consumer perspective. Based on MediaCom Insight's (2017) consumer survey, 38 percent of Norwegian consumers wish to obtain a higher knowledge level on the topic of organic produce, and, among these consumers, a large fraction already purchases organic food frequently (MediaCom Insight, 2017). This is also the case in other countries where Zanolli & Naspetti (2002) found that consumers wish to obtain a better understanding of organic production and processing. Hence, if consumers require and aspire more knowledge about organic food and production methods, what is their reasoning behind their current purchase preference and behavior? Based on this, we formulated the following research question to give a contribution to the subject:

*How does consumers objective knowledge differ based on their preference for and subjective knowledge about organic produce?*

Based on the research question, this master thesis attempts to examine the general Norwegian knowledge level of organic products and its different attributes. We are also interested in how this is affected by the consumers' purchase intention. With this study, we hope to contribute to the discussion concerning consumer behavior related to the subject of organic products. On top of that, we also wish to locate the Norwegian consumer's knowledge level of the different attributes involved, since this study provides a deeper understanding of Norwegian habitant. We predict that Norwegian consumers' objective knowledge about taste, nutrition, and environmental factors of organic food differs based on their subjective knowledge and preference for organically produced food. The thesis is divided into four main parts: Literature review, methodology, results and discussion.

## **2.0 Literature Review**

The literature review is divided into six different parts: organic food trend in Norway, government and labeling systems in Norway, nutrition & vitamins, taste, and environment. Organic products are perceived as a sustainable, tasty, and healthier option compared to conventional products by many consumers (Olson, 2017). However, there are several different opinions in the literature and among consumers regarding the advantages and disadvantages of organic products.

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## 2.1 Background

### 2.1.1 Organic Food Trend in Norway

An individual has two different choices to choose from in a purchase situation: they could either buy conventional or organic food (Olson, Mcfearran, Morales, & Dahl, 2016; Vittersø & Tangeland, 2015). Findings state that there is an increasing trend of choosing organic products across several product categories (Debio, 2011). This is also the case in Norway, where the market share has had a positive trend and increases every year.

However, the market share varies across different product categories (Landbruksdirektoratet, 2017a; Juhl, Fenger, & Thøgersen, 2017). Statistics from Debio (2011) shows that the growth in organic production units in Norway have been increasing drastically since 1990 to 2010 (Figure 1). This is in line with the increasing

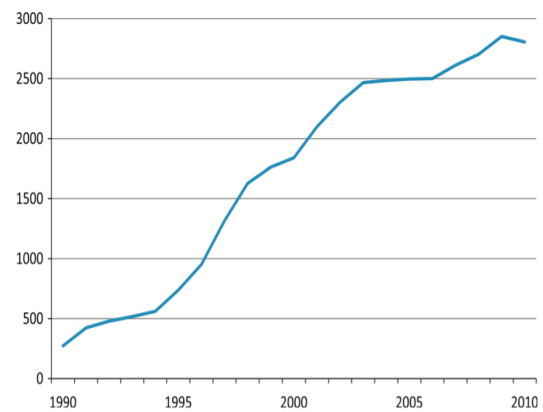


Figure 1: Number of Organic production units in Norway from 1990 to 2010.  
Source: Debio (2011) cited in Bjørkhaug & Blekesaune, (2013)

demand for organic food. Thus, consumers frequently aspire to choose products that are perceived as a more ethical choice (Olson et al., 2016).

Statistics from the Norwegian Government demonstrate that the turnover for organic products in Norway has quadrupled (from NOK 500 million to NOK 2 billion) from 2006 to 2015 (Stortinget, 2017). Even though organic products still have a low market share compared to conventional substitutes (Van Doorn & Verhoef, 2011), financial numbers show that the Norwegian retail stores had a turnover of NOK 562 million for only selling organic vegetables (Landbruksdirektoratet, 2017a). This could be a result of the increased production and supply, as well as the increased request for organic food. Based on this, there is reason to believe that consumers have a positive attitude towards organically produced food.

A consumer's attitude is an important driver towards purchasing organic food. Tarkiainen and Sundqvist (2005), Magnusson et al. (2001) and other researchers

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have highlighted the importance of understanding consumer behavior around organic purchase decisions. Indeed, the interest in organic products has increased among both academics and consumers.

### *2.1.2 Government and Labeling Systems in Norway*

According to the Environmental Performance Index (2016), Norway is ranked 17th on their list that compares 180 countries worldwide. The previous government set a target that organic food should account for 15 percent of food consumption by 2020 (Vittersø & Tangeland, 2015; Bjørkhaug & Blekesaune, 2013). This goal is highly ambitious, and thus the focus on organically produced food is highly prioritized by the Norwegian government. To achieve this goal, the government distributes NOK 178,8 million yearly to improve the value chain, as well as educating people on organic produce and production methods (Regjeringen, 2018). According to Juhl et al. (2017), consumers' trust in organic food has increased over time for countries with an established organic food market. Their research also indicate that a state involved organic labeling system results in higher trust in terms of quality and other advantages of the products. Mattilsynet, controlled by the Norwegian government, has approved the organic labeling system Debio (Mattilsynet, 2017). Therefore, as Mattilsynet has a strong reputation among Norwegian consumers, the trust in the organic labeling system is assumed to be high. However, recent research conducted in Norway explains that Norwegian consumers are happy with the range of organic food, but the trust in the labeling system and quality of the food is more negatively perceived (Vittersø & Tangeland, 2015). Hence, why are consumers starting to question organic production method?

In addition, Norwegian trend numbers showed a high result of the search phrase "What is organic food?" and that the most related search word to organic food was "Fairtrade" (Google Trends, 2017). This can be related to Padel and Foster (2005, p. 610) findings that "...about one-third of respondents of the 2002 TNS survey did not know how to correctly identify an organic product". This could indicate that the general Norwegian consumer (and consumers from other developed countries) does not have accurate knowledge about organic products and production methods and are also consistent with the assumption that Norwegian consumers acquire more knowledge on the given topic.

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## ***2.2 Organic Attributes***

### *2.2.1 Nutrition and Vitamins*

Pro-organic and consumers in general expect organic food to be healthier and have less calories than food produced conventionally (Lairon & Huber, 2014; Olson et al., 2016; Magnusson et al., 2001; Zanolli & Naspetti, 2002). A survey on Norwegian consumers identified that the perceived health benefits was one of the main reasons for organic consumption (MediaCom Insight, 2017). To support the claim, research has found a 30 percent lower risk of pesticide contamination when eating organic fruit and vegetables compared to conventional alternatives, even though it is within the allowable safety limit (Brandt, 2012). Nevertheless, these health claims could be challenged as research has found contradictory evidence (Smith-Spangler et al., 2012; Brandt, 2012; Olson, 2017; Dangour et al., 2009).

Smith-Spangler et al. (2012) conducted an extensive meta-analysis, investigating the health benefits of organic food. Bravata, one of the main authors of the article, had many patients questioning this issue and thus wanted to investigate further (Brandt, 2012). They were very strict in their literature selection, not including the same experiment twice (if an experiment occurred in several papers) and excluded organization funded research with financial interest. This increased the validity of the study. Prior to the study, the researchers claimed not to have a strong opinion regarding organic food and the findings was aimed at educating people, not to discourage purchase decision (Brandt, 2012).

The meta-analysis found that the vitamin content of organic plant and animal products are equivalent to the vitamin content of conventionally produced products (Smith-Spangler et al., 2012). Analyzing the nutrition content revealed that only the phosphorus content of organic produce was superior to conventional products, a result that was only significant in one of the experiments considered. Overall, the findings in the literature they reviewed was either unclear or insignificant (Smith-Spangler et al., 2012; Brandt, 2012). Hence, their findings illustrated that there were no significant health advantages of eating organic food. This is also supported by Dangour et al. (2009) meta-analysis based on findings from the last 50 years, which also found that there is no difference in nutrition quality for 10 out of 13 categories analyzed, and that the small differences are due to production methods. Thus, the

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price of organic produce, favorable advertising and claims regarding health benefits could not be justified, based on this information (Smith-Spangler et al., 2012; Brandt, 2012; Olson, 2013; Olson, 2017; Dangour et al., 2009). Additional support questioning the health claims, De Boer (2003) discovered no difference in the fat and protein content between organic and conventional milk.

Based on findings questioning the health claims of organic food stated above, it could be interesting to investigate the perception from Norwegian consumers and their reasons for purchasing organic. We believe that organic buyers generally have less knowledge regarding the correct and incorrect health claims of organic food than organic skeptics. This brings us to our first hypothesis:

*H1: Frequent organic buyers are more likely than infrequent buyers to have inaccurate beliefs regarding health benefits of organic food.*

### 2.2.2 Taste

A large amount of literature on organic food investigates consumers' perception of taste on organic food compared to conventional food. Magnusson et al. (2001) study states that the single most important purchase criteria for consumers is taste; hence, this is an important attribute to consider for the producers, marketers, and retailers in terms of conversion to purchase. The study method used in their paper was a random nationwide questionnaire conducted in Sweden. Thus, due to similarities within the Scandinavian countries, the findings regarding the importance of taste could also reflect Norwegian consumers beliefs and attitudes. However, it is essential to consider that while the Norwegian and Swedish population have similarities, they are not identical. Further, the response from the online survey indicated a low interest in the study due to a relatively low response rate (58 percent). Based on this, the findings could arguably be "biased", as it is based on a specific group of people highly interested in the topic.

Nevertheless, this finding regarding the importance of taste is also supported by Olson (2017), which found and argues that, among commenters commenting on the Stanford meta-analysis about organic products and nutrition, one of their main reasons for purchasing organic is taste. Hence, there are multiple researchers supporting the importance of taste, and it is reason to believe that taste is an

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important criterion for purchase of organic food also for the Norwegian population. This assumption is supported by MediaCom Insights (2017) survey on Norwegian consumers regarding organic food.

Due to its high price and exclusion of man-made fertilizers, many consumers perceive organic food as having a superior taste compared to non-organic counterparts (Hughner et al., 2007; Olson, 2017). Nevertheless, in blind tastings, there is no significant difference in taste between organic food and conventional food (Hughner et al., 2007; Olson, 2017). This finding is also supported by Fillion and Arazi (2002); however, their research finds that each product type should be treated individually. Hence, the taste assumption is just a consumer perception based on their knowledge about organic benefits and their associated attitude towards organic food. Therefore, it is impossible to claim that organic food tastes different than conventional food.

Moreover, empirical studies find that organic food does not taste better than conventional food, even though it is one of the most important criteria for purchase. Yet, many people perceive organic food as having a superior taste (Olson, 2017); this also includes Norwegian politicians. A study conducted by Matmerk in 2017 on Norwegian consumers, found that 18 percent purchase organic food because they believe it tastes better (MediaCom Insights, 2017). Existing research on the topic have yet to raise an interesting aspect on the subject, and more specifically research on Norwegian consumers. Even though there are some statistics of how many Norwegians believe organic food taste better, are there any difference between pro-organic and skeptics in terms of their taste perception? Based on the above-mentioned literature, the following hypothesis has been developed:

*H2: Pro-organic consumers are more likely than organic skeptics to have inaccurate beliefs regarding the taste of organic food.*

Based on theory and existing literature, we predict that a pro-organic Norwegian consumer with high subjective knowledge, perceive organic food as superior in terms of taste. Moreover, we assume that organic skeptics believe that organic food tastes the same (or worse) as conventional food.

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### *2.2.3 Environment*

Organic products have been a way for food producers to meet the demand for more environmentally friendly options (Kareklas, Carlson, & Muehling, 2014; Vittersø & Tangeland, 2015). Some researchers and consumers consider organic products to be more environmentally friendly as it is not grown with man-made, chemical fertilizers which pollute the water, soil and air (Kareklas et al., 2014; Karmarkar & Bollinger, 2015; Mondelaers, Aertsens, & Huylenbroeck, 2009). Hence, consumers in wealthy countries are questioning the agriculture and production of conventional food, as they believe the process harms the environment and animal health and welfare (De Boer, 2003; Mondelaers et al., 2009). In fact, the main reason why Norwegians purchase organic food is their perception that it is more environmentally friendly than conventionally produced food (MediaCom Insight, 2017).

Nevertheless, in recent years, research has found some attributes about the organic production methods, which questions the environmental benefits of it (Seufert et al., 2012; De Boer, 2003; Olson, 2017). Thus, there are reasons to question several aspects of the environmental perception by some consumers and researchers regarding organic food and production methods. Firstly, the durability date of most organic food, especially fruit, is shorter than conventional food and hence food waste increases (Hoeft, 2018). This is also an important factor for Norwegian consumers according to the study by Torjusen, Lieblein, Wandel, and Francis (2001). However, what is often discussed in the literature regarding environmental issues of organic food and production method is the issue of food miles, animal welfare and yield of organic versus conventional food.

#### *2.2.3.1 Sustainability*

One of the major concerns and challenges around the globe is the growing population, thus, the demand for meat and high-calorie food is increasing (Seufert et al., 2012). This implies that food producers need to find ways to produce food more effectively and minimize the use of land. Organic food has been presented as a solution for this challenge. Several studies argue that organic production have reduced the environmental impact of agriculture; however, one of the most questioned attributes of organic production and concern among organic skeptics, is that it requires more land to produce compared to its conventional competitors



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(Seufert et al., 2012; De Boer, 2003; Olson, 2017; Mondelaers et al. 2009; Tuomisto, Hodge, Rioerdan & Mcdonald, 2012). As organic food contributes to a more widespread deforestation, it is not a sustainable method to feed the growing population (Seufert et al., 2012; Connor, 2008).

Badgley and Perfecto's (2007) article can be regarded as one of the first studies with a focus on the yield of organic versus conventional agriculture. The article argues that organic production methods are sufficient to feed the world. However, this study has received criticisms in terms of their methodology (Cassman & Hendrix, 2007; Connor, 2008). Firstly, Cassman and Hendrix (2007) argue that the article does not meet the minimum scientific requirements for comparing food production capacity in different crop production systems. Another bias was that their use of data from crops was not completed truly under organic management and consists of inappropriate yield comparison. Thus, the study failed to meet methodological standards for comparing organic versus conventional agriculture, and, therefore, its findings could also not be considered accurate.

Nevertheless, both prior and post Badgley and Perfecto's (2007) research paper, there has been several studies arguing that organic agriculture indeed uses more land per produce than conventional agriculture (Seufert et al., 2012; De Boer, 2003; Olson, 2017; Connor, 2008). De Boer's (2003) research paper aimed to discover the environmental differences in the production of conventional versus organic milk. Even though the paper argues that organic milk production reduces pesticide use and the negative impact this causes, it is also argued that organic milk production increases the land use per ton of milk. Nevertheless, the conclusion in this study was mainly based on results from experimental farms, and arguably there should be experiments performed on practical farms in order for the findings to be fully supported.

A few years later, Seufert et al. (2012) conducted a meta-analysis to examine the yield performance of organic and conventional farming systems globally. According to the authors, they were very strict when they selected the literature to include, such as: only looking at articles using truly organic systems, and articles including both sample size and errors. While searching for literature, they found that only a few studies attempted to synthesize the information (yield performance)

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on a global scale. The paper argues that, when conventional and organic systems are the most comparable, organic production have 34 percent lower yields than conventional production. Another meta-analysis conducted by Modelaers et al. (2009) using 10 studies from developed countries (studies which were not considered in Seufert et al. (2012)) also found lower land use efficiency in organic farming. This confirms the theory that, when considering land use, organic production could be regarded as less sustainable and thus less environmentally friendly.

The meta-analysis conducted by Tuomisto et al. (2012) analyzed conventional and organic farming in Europe and found that organic farming has positive environmental impact per unit of area, but not per product unit. The paper is published in a highly renowned journal (Journal of Environmental Management), however, the researchers did not have any restrictions on publication year or journal ranking. While they also considered many different factors regarding organic farming, their most interesting result was their finding that, in Europe, organic farming required 84 percent more land than conventional farming. This was mainly due to lower yielding animals and land area requirement for fertility building crops, in addition to lower crop yields. This finding is consistent with the findings in both Modelares et al. (2009) and Seufert et al. (2012). As a conclusion, the paper suggests that the main challenge for organic farming systems to improve overall sustainability is to increase yields without causing harm to the environment.

Based on the findings concerning yield and sustainability mentioned above, this thesis attempts to capture consumers knowledge regarding sustainability and how this knowledge affects their opinion of organic produce. We believe that those consumers who are unaware of the issue regarding land use, favor organic products, and thus have a higher purchase intention than those who are aware of this critical issue. This brings us to our third hypothesis:

*H3: Pro-organic consumers are more likely than organic skeptics to have inaccurate beliefs regarding the sustainability of organic production.*

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### 2.2.3.2 Food Miles

Another attribute of organic produce is the issue of food miles (Burt & Cash, 2007; Seyfang, 2006). Food miles can be defined as the distance the food must travel from the farm to the grocery store (Burt & Cash, 2007; Seyfang, 2006). Locally produced food has become an increasing trend among consumers in most parts of Europe, as the food is perceived to have a better quality while also being more environmentally friendly due to the lack of food miles (Kareklas et al., 2014; Karmarkar & Bollinger, 2015; Vittersø & Tangeland, 2015). The fact that a product is produced in Norway is considered important (somewhat to extremely important) by approximately 80 percent of the respondents in MediaCom Insight survey based on Norwegian consumers (2017). In addition, almost half of the consumers who frequently purchase organic state that Norwegian origin is essential when purchasing organic products (MediaCom Insight, 2017).

Nevertheless, organic should not be mixed up with locally produced food. One of the major limitations regarding organic food is that the produce is often transported from great distances (Burt & Cash, 2007). This diminishes the environmental benefits of growing the food organically, and hence it could be argued that this result in a smaller difference in the cost of the environment between organic and conventionally grown produce (Burt & Cash, 2007). An important fact to mention here is that the article should be questioned based on the limitations identified, such as: there was no information about the research method and the study and research was old and only tested in North America (Burt & Cash, 2007).

Seyfang (2006) also researched the issue of food miles, but in a different context. The article acknowledges and highlights sustainable consumption and the importance of local organic food. Even though the researcher mentions that buying organic is better than buying conventional food in most cases, she also questioned whether consumers confuse the difference between locally grown and organically grown; in many cases it is recognized as the same thing by the consumers (Seyfang, 2006). Based on this question we assume that most Norwegians believe that the majority of organic food is produced on small local farms and could be considered local food. This brings us to our fourth hypothesis:

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*H4: Norwegian consumers, both pro-organic and skeptics, believe that most organic food is produced on small local farms.*

Thus, organic food is arguably not as environmentally friendly as it is perceived by many consumers and researchers. Organic could be regarded as more environmentally friendly and sustainable if the production yield is improved and the transportation distance is reduced; and that consumers become more concerned with eating in season fruit and vegetables and reducing meat consumption (Seufert et al., 2012; Olson, 2017; Seyfang, 2006; Burt & Cash, 2007).

#### 2.2.3.3 Animal Welfare

Another, less discussed, but still important topic of organic food is animal welfare. According to Harper and Makatouni (2002), animal welfare, in addition to health, food safety, and environmental impact, is one of the main reasons why consumers purchase organic food. The paper identifies that consumers struggle to classify the difference between “organic” and “free-range”, and, in fact, most consumers perceive it to be equivalent (Harper & Makatouni, 2002). This indicates that some consumers purchase organic food because they believe it is more animal friendly than conventional food. Another interesting finding, located in a Power Point presentation retrieved 14<sup>th</sup> of March 2018 by the Manager of Academics at Matmerk, is that, when considering animal welfare, the difference between organic and conventional farming in Norway is virtually the same. Based on these findings, we predict that Norwegian consumers believe that animal welfare is considerably better in organic farming than in conventional farming. Thus, we hypothesize the following:

*H5: Norwegian consumers believe that the animal welfare is significantly better in organic production compared to conventional production.*

### **3.0 Methodology**

In the following section we describe; the research design, the participants, the sampling design, the questionnaire development process, the process of pre-testing, and the development of the final questionnaire, in addition to the data cleaning and editing, sample characteristics, and cluster development.

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### ***3.1 Research Design***

This study aims to get information about the general Norwegian consumer. To draw conclusions about this population, we considered a quantitative questionnaire to be the most appropriate technique to collect the primary data; hence, capture information essential to answer our hypotheses. We also decided to introduce an incentive, a chance to win a gift card of NOK 200, to attract respondents.

### ***3.2 Participants***

The participants were sampled firstly through convenience sampling technique, where friends, fellow students and family were asked to complete the survey. Furthermore, we used a snowball sampling technique, where friends and family were encouraged to share the survey with their network through social media channels and email. This allowed us to reach out to a broader network with different demographic groups and segments. However, since we only reached the most accessible respondents and their network, this method could be seen as biased as we picked the participants and therefore the participants are not randomly selected (Malhotra, 2010). Therefore, the sample might not be representative of the population. However, to be able to decrease this bias and to collect a sample unit with different characteristics, we contacted Matmark (Debio), Norges Landbruksdepartement and Nibio; and distributed the survey using social media channels (such as forums and groups) and e-mail. This enabled us to get a wide specter of respondents, as well as to reach people with different knowledge levels about organic food.

Numbers from Statistics Norway shows that the number of inhabitants living in Norway as of January 2018 was 5.302.778 (SSB, 2018). Moreover, approximately 50.4 percent of the Norwegian population are male whereas 49.6 percent are female. Hence, this statistic number was used as an indicator of how large the Norwegian market is, and the percentage distribution of male/female was used as an indicator of the gender balance we wanted in our study.

Lastly, it is important to mention that our research does not target a specific demographic group. Nevertheless, demographic variables were added to the questionnaire, as it enabled us to compare answers between gender, age (18+),

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location, education, and income. Thus, we had the possibility to detect different behavioral patterns and characteristics of the different demographic categories.

### ***3.3 Main Study***

#### *3.3.1 Questionnaire Development*

The questionnaire was created using the online questionnaire service Qualtrics. The reasoning behind this choice was that this service allowed us to choose a variety of settings, as well as it allowed us to distribute it to a larger area in Norway, since Qualtrics is an online service. Another reason for using an online questionnaire service was because it increases the internal validity of the questionnaire as respondents could not go back and change their answer after a response was given. Another advantage was the ability to check the ongoing drop-out rate; i.e. where do the respondents drop out and how many of them drop out. This gave us an indication of how many participants that had finished the survey.

Malhotra's Marketing research book (2010) were used as a framework for scale development and designing of the questionnaire, as well as the Marketing Scale Handbook by Bruner (2009) to get the right wording of the questions. To diminish the bias of people misunderstanding the questions/statements, unambiguous questions and words with only one meaning was used (Malhotra, 2010). Thus, this was a focus area during the development of the questionnaire.

The categorical order was randomized to minimize bias from the order of the questions, and, as mentioned, the respondents were also not able to go back and change their answers. As the survey only consisted of questions including neutral response, we could use forced response as a default setting. Thus, we would not get any missing values in the data set obtained (Janssens, Wijnen, Pelsmacker, & Kenhove, 2008). To strengthen the internal validity, it was important to consider the social desirability biases when formulating the questions and making the questionnaire. Social desirability bias can, according to Fisher and Tellis (1998, p. 563), be defined as a "Systematic error in self-report measures that result from the desire of respondents to project a favorable image to the researcher". Based on this definition, one can say that this might easily occur since we are trying to look at the underlying reasons for the consumption of organic food. One way we tried to reduce the bias was by stating in the beginning of the survey that it was strictly anonymous.

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Lastly, to improve the response rate of our survey, the survey was kept short to minimize the exit rate. Mentioning of confidentiality and purpose of survey along with an incentive to participate also enhanced the response rate. The more respondents the survey received, the more we could generalize the responses based on the population (Sekaran & Bougie, 2013).

### *3.3.2 Pre-test*

In the questionnaire development process, we conducted a pre-test of the entire main study prior to mass distributing the questionnaire and collecting the final data. The pre-test was conducted on several different consumer segments based on their lifestyle to get a wider range of knowledge and answer possibilities, hence more representative of the entire Norwegian population. The pre-test involved a small sample of respondents ( $n = 10$ ), based on recommended pre-test procedures (Burns & Bush, 2009). The participants in the pre-test were observed, in person, while they took the online survey, enabling them to give us feedback during and after the survey was conducted. This enabled us to identify and eliminate potential issues with the designed survey (Malhotra, 2010), and was also an essential procedure to receive as valid and reliable results as possible.

The feedback for the survey was good overall; however, some changes were made according to the feedback, such as: rephrasing questions, adding descriptions of difficult words, changing some of the alternatives and general grammatical errors. Additionally, the survey was sent out to a new small sample ( $n = 10$ ) matching our respondents' criteria. This time, neither systematic nor random errors was found, and we were satisfied with our main and final survey. The people who participated in the pre-study were excluded from participating in the final study.

### *3.4 Design and Procedure*

The respondents were presented with a welcoming message and an introduction to the survey, as well as being informed about the chance of winning a gift card. We emphasized that the participation was voluntary, and the data collected was anonymous. To be able to proceed, the respondents had to agree with our terms.

The final questionnaire distributed was divided into four main parts: (1) the respondents' subjective knowledge, hence the consumers' perceived knowledge

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about organic products; (2) a quiz testing the consumers accurate and inaccurate knowledge; (3) questions regarding their preference of organic products; and lastly (4), some final demographic questions.

#### *Part 1: Subjective Knowledge*

After reading the terms, it was essential to start with identifying Norwegian consumers' knowledge about organic products. This included consumers' subjective versus objective consumer knowledge. To be able to do this, the study started with general questions capturing their subjective knowledge (Appendix 1, question 1 – 4). According to Bruner (2009), subjective questions captures the respondents' opinions of their knowledge, while objective questions attempt to evaluate the respondent's actual knowledge by asking questions with a correct answer.

#### *Part 2: Objective Knowledge*

The second part objectively measured the respondents' knowledge about organic products and production methods; thus, attempted to capture the respondents accurate and inaccurate knowledge (Appendix 1, question 5 – 15). This was tested using dichotomous questions (Malhotra, 2010); hence, having two response alternatives. In this case, “true”/“false”, and additionally supplemented by a neutral alternative labeled “I don't know”. A neutral alternative is essential, and if a neutral alternative is not included, the questionnaire forces the respondents to choose between true or false, even when they feel indifferent or do not know the answer (Malhotra, 2010). Thus, in order to increase internal validity, a neutral alternative was provided. However, this could, in turn, result in a need for more respondents to gain a representative result, as there is a danger of several respondents choosing the neutral option.

#### *Part 3: Preference*

The third part of the quantitative questionnaire measured the respondents' preference for organic food, i.e. the dependent variable. The scaling technique used was a non-comparative 7-point Likert-scale from the response categories (1 = Strongly disagree to 7 = Strongly agree), similar scale was also used in part 1 testing respondents' subjective knowledge. A 7-point scale was used in our questionnaire, as a wide scale will give a more realistic picture (Allen & Seaman, 2007). The scale also included a neutral point that the participants could choose, in our case option



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4 “neither agree nor disagree” (Janssens et al., 2008). In addition, to control for acquiescence biases, we included a reversed scale on two questions: organic food is a waste of money and organic food offers good value for money.

#### *Part 4: Demographics*

In the last part of the study, respondents were asked to answer standard demographic questions. These questions included age, gender, salary, education, and geographical living area. To limit bias in the respondents answers, the questions about demographics were presented at the end of the questionnaire (King & Bruner, 2000). Gender and income related questions should include a “Do not want to answer” alternative; therefore, this was added to the response alternatives (Bruner, 2009).

#### **3.5 Data Cleaning and Editing**

From the Qualtrics Survey Software, all the data was transferred into the statistical software SPSS to be able to analyze the results of the questionnaire. One and a half month of data collection resulted in 405 respondents starting the survey, while 356 completed our survey. Hence, this corresponded to a satisfactory completion rate of 87.90 percent.

The data set indicates that 49 of the respondents started the survey but did not complete it. These responses were regarded as invalid data and thus deleted from the dataset before we continued to analyze the data collected. For part 2 (Quiz) in the survey, we re-coded question 7, 9 and 10 for all true answers to be labeled 2, false labelled as 1 and I don't know as 3. This made it easier to analyze the answers together. All “I don't know” answers were not coded as a missing value as this data was essential for our analysis. This was primarily because we were interested in the Norwegians knowledge level on the given subject, and all information regarding the respondents' knowledge was relevant for our study.

For the data to be easily analyzed, in the questions regarding preference for organic food (Part 3), the questions; “Organic food is a waste of money” and “Organic production cannot feed the world”, was re-coded using reverse coding as they were negatively loaded compared to the other questions in the category. Thus, to be able to compare the questions, 1 = strongly disagree was changed to 7 = strongly disagree as we believed a person answering “strongly disagree” in these questions

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would correspondingly answer “strongly agree” on the remaining questions in this part. In addition, other changes made in the SPSS was made continuously to analyze and answer the different hypotheses.

### ***3.6 Descriptive Statistics***

Out of 356 respondent the gender distribution showed that 48.6 percent ( $n = 173$ ) were male, while 51.4 percent ( $n = 183$ ) were females, which is close to the gender balance within the population as stated in the 3.2 Participants section. Furthermore, the descriptive statistics show that 67.1 percent live in the city, 19.7 percent live in the suburbs, and 13.2 percent live in the countryside. In terms of the age distribution we observed that the younger generation had the highest response rate, with a total of 57.9 percent of the respondents being aged 34 or younger (See appendix 2 for more details). This may be due to the sampling technique used. Additionally, noteworthy to mention regarding respondents’ characteristics is that, in terms of education, the majority (89 percent) of our respondents have 3 years or more with higher education.

### ***3.7 Cluster Solution***

In terms of the four questions on perceived knowledge about organic produce (Part 1) the mean value was 3.97 ( $SD = 1.43$ ). This indicated that we had a sample including people with high and people with low subjective knowledge, and an average approximately around the neutral point. Hence, the sample, on average, had an average subjective perceived knowledge about organic food.

To measure the internal consistency reliability of the subjective knowledge factor, we calculated the Cronbach's alpha. The result for the output shows a Cronbach's Alpha value greater than .80 (4 items;  $\alpha = .882$ ) indicating that the result was “good” and heterogeneous (Janssens et al., 2008). Thus, we did not need to delete one of the items for the result to be reliable. This result enabled us to summarize the scales for the factor subjective knowledge, and then create groups of high and low knowledge respondents based on subjective evaluations (Q1 to Q4).

The quiz part (Part 2) of the survey enabled us to capture the respondents objectively accurate knowledge regarding the subject. This information was used to test their actual knowledge against their perceived knowledge.

Part three of the questionnaire captured the respondents’ preference for organic food. The mean value of 4.42 ( $SD = 1.24$ ) indicated that the respondents generally had a strong preference for organic food. The internal consistency reliability was also tested on the preference factor using Cronbach’s Alpha. The Alpha value was  $\alpha = .888$  (6 items), hence substantially larger than .80 indicating a very good result based on the mentioned criteria for Cronbach’s Alpha (Janssens et al., 2008).

These three variables mentioned above were important factors when answering the research question and hypotheses stated in the literature review. A cluster solution was created to be able to analyze and answer the different hypotheses and the research question. The cluster solution is representative of the data structure, and helped define homogeneous groups, hence subgroups (Hair, Anderson, Tatham & Black, 1998).

A four-cluster solution was created, using hierarchical clustering method (Ward’s method), based on the respondents’ subjective knowledge and preference for organic food (Table 1). This cluster solution was

	Low subjective knowledge	High subjective knowledge
Low preference	2	4
High preference	1	3

Table 1: Four-cluster solution

used throughout the analysis, except for hypothesis 1. Table 2 illustrates the number of respondents in each cluster as well as the mean values of preference and subjective knowledge within the different clusters where high value equals higher preference or subjective knowledge and vice versa. To test the significance level for the different hypotheses, we used p-value ( $p < .001$ ) and the two conditions of the “Pearson chi-square” statistics: “...less than 20 percent of the cells have an expected count of less than 5, and the minimum theoretical expected frequency is greater than 1...” (Janssens et al., 2008, p. 334).

Four Cluster Solution	Preference	Knowledge	N
Cluster 1	4.68	3.68	127
Cluster 2	4.11	2.06	84
Cluster 3	5.5	5.48	90
Cluster 4	2.51	5.1	55

Table 2: Four Cluster Solution – Mean values and respondents within clusters.

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## 4.0 Results

The following section explains the different steps and actions made to analyze the data from the survey and the findings related to the different hypotheses.

### 4.1 Findings

**H1:** To test hypothesis 1, frequent organic buyers have less accurate knowledge about organic health “advantages” than infrequent buyers, we first had to break the respondents into frequent and infrequent buyers. By calculating the mean of the overall food and drink consumption, using question 22, we found that the average mean of total food consumption was 2.27 ( $SD = .91$ ). Based on this finding we decided that buyers with a mean above 3.00 would be regarded as frequent buyers as their overall consumption of food was more than 21 percent. The remaining respondents would be regarded as infrequent or non-buyers. The results for the visual binding revealed that the number of infrequent buyers stands for 73.9 percent ( $n = 262$ ) and highly frequent buyers 26.4 percent ( $n = 94$ ).

Before we ran the t-test, we coded the health advantage questions (Q11, Q12 and Q13) into 2 levels (0 = “False” and “I don’t know”, 1= “True”). This enabled us to compare the answers in the three health questions up against the frequent and infrequent buyers. The t-test was significant ( $t(354) = 4.15, p = .001$ ) based on a significant level  $p < .05$ . The infrequent buyer group had a mean of 36.6 percent ( $SD = .36$ ) and the frequent buyer group had a mean of 19.9 percent ( $SD = .29$ ). This indicated that the infrequent buyers had more knowledge about the health “advantages” of organic food than the more frequent buyers. Thus, we can confirm the hypothesis.

Group	Mean	N	Mean	Std. Deviation	Std. Error Mean
Frequent buyers	> 3	94	.3664	.35222	.02176
Infrequent or non-buyers	< 3	262	.1986	.28637	.02954

Table 3: Frequent and infrequent buyers.

Running an additional t-test with the three different questions separately, revealed some interesting differences between the groups and the corresponding questions. These findings were significant (Q11:  $t(354) = 3.26, p = .001$ , Q12:  $t(354) = 4.23, p = 0.001$ , Q13:  $t(354) = 1.77, p = .001$ ). In question 11 (regarding vitamins and nutrients content) the infrequent buyer group had a mean 0.52. In other words, more

than 50 percent answered this question correctly, stating that organic foods have approximately the same vitamins and nutrients. In question 12 regarding health benefits, we found the largest difference between the groups. The infrequent buyers group had 43 percent of the respondents answering the question correctly, while the frequent buyers had only 19 percent of respondents with correct answers.

		N	Mean	Std. Deviation	Std. Error Mean
<b>Quiz11</b>	Infrequent or non-buyers	262	.52	.5	.031
	Frequent	94	.33	.473	.049
<b>Quiz12</b>	Infrequent or non-buyers	262	.43	.496	.031
	Frequent	94	.19	.396	.041
<b>Quiz13</b>	Infrequent or non-buyers	262	.15	.353	.022
	Frequent	94	.07	.264	.027

Table 4: Divided by quiz question 11,12 and 13.

**H2:** The second hypothesis indicates that pro-organic consumers are more likely than organic skeptics to have inaccurate knowledge regarding taste beliefs of organic food.

The four-cluster solution was analyzed using crosstab of the answers to the taste question (Appendix 1) to be able to compare the results differences between the groups. The two groups that stood out in the cluster solution was group 3 and 4 (See Table 1 and 2). Group 3, with the highest preference for organic food, had the strongest perception that organic food tastes better (Table 5). On the other hand, group 4, with the lowest preference, only 18.2 percent of the respondents believed that organic food tastes better than conventional alternatives.

This indicated that those with high preference for organic food perceived organic food as having superior taste. Furthermore, those with low preference for organic food did not perceive organic food as being superior in taste. As the tests were significant according to the chi-square test  $\chi^2 (6, N = 356) = 77.9, p < .001$  (Appendix 4), considering the similarity/dissimilarities between the groups, we can confirm the hypothesis that pro-organic consumers have inaccurate knowledge regarding taste beliefs of organic food.

Quiz answers	Group 1	Group 2	Group 3	Group 4
<b>False/taste better</b>	40.2%	23.8%	67.8%	18.2%
<b>True/ taste same or worse</b>	31.5%	35.7%	20 %	72.7%
<b>I don't know</b>	28.3%	40.5%	12.2%	9.1%

Table 5: Quiz answers based on four-cluster solution.

**H3:** For hypothesis 3 we assumed that pro-organic consumers are more likely than organic skeptics to have inaccurate knowledge about the sustainability of organic production. We started by calculating the means of questions 7 and 9 in the quiz as they both considered sustainability issues. Using the four-cluster solution, we ran crosstabs with the new variable created.

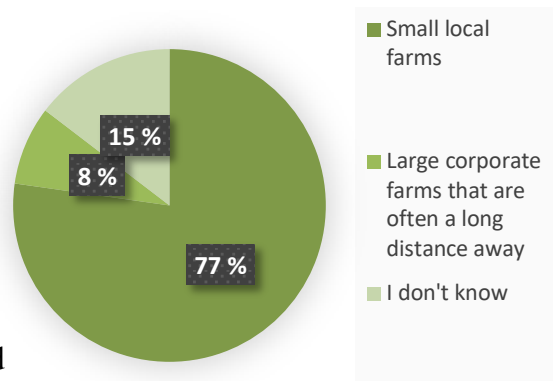
The group with low preference and high subjective knowledge (Group 4) had 89.1 percent of the respondents answering both questions correctly. While in the remaining groups this score was much lower, with group 3 (high preference and subjective knowledge) having the highest percentage of respondents answering both questions incorrectly. Thus, those with accurate knowledge about sustainability had a lower preference for organic food than those with inaccurate knowledge. In addition, those with both a high preference for and subjective knowledge about organic food overall had the worst score regarding sustainability issues (See Table 6). The groups were also significantly different according to the chi-square test  $\chi^2(6, N = 356) = 67.4, p < .001$ , and we therefore find support for the hypothesis (Appendix 5).

Sustainability Answers	Group 1	Group 2	Group 3	Group 4
Zero correct	34.6%	45.2%	31.1%	1.8%
50% correct	33.1%	27.4%	32.2%	9.1%
Both correct	32.3%	27.4%	36.7%	89.1%

Table 6: Sustainability answers based on four-cluster solution.

**H4:** Hypothesis 4 suggests that Norwegian consumers in general believe that most organic food is produced on small local farms, instead of remote large corporate farms.

Firstly, using the four-cluster solution based on the preference and subjective knowledge questions, and comparing them with the answers in question 8 (Appendix 1) revealed that most of the respondents believed that organic food is produced on small local farms, independent



Figur 2: Diagram H4.

of which group they belong to in terms of preference for organic food. In fact, a total of 77 percent of all the respondents believed that organic food is produced on small local farms. The small difference between the groups was insignificantly different  $\chi^2(6, N = 356) = 6.6, p = .360$ , which indicated that the difference was not large enough to significantly differ the groups (Appendix 6). Hence, a large part of Norwegian consumers believes that most organic food is produced on small local farms and we can confirm the hypothesis. Nevertheless, even in this case, group 4 had the highest percentage of correct answers (10.9 percent) and lowest percentage of incorrect answers (70.9 percent) compared to all the other groups (Table 7).

Quiz answers	Group 1	Group 2	Group 3	Group 4
Small local farms / False	77.1%	72.6%	85.5%	70.9%
Large corporate farms / True	7.9%	8.3%	6.7%	10.9%
I don't know	15 %	19.1%	7.8%	18.2%

Table 7: Question 8 answers based on four-cluster solution.

**H5:** Hypothesis 5 indicates that Norwegian consumers believe that animal welfare is better when food is produced organically. Running a frequency test on question 14 revealed that approximately 70 percent of the respondents believed that the animal welfare is significantly better in organic production. Furthermore, only 15 percent believed that organically raised animals generally do not have a significantly better quality of life. Nevertheless, running the question up against the four-cluster solution explained in section 3.7 considering subjective knowledge and preferences, there was a clear difference between the four groups.

In group 4, claiming to have high subjective knowledge and low preference for organic food, only 43.6 percent answered incorrectly (Appendix 3), while 45.5 percent answered the question correctly. On the other hand, for the two groups with high preference for organic food (group 1 and 3) the percentage of incorrect answers were 75.6 and 87.8 percent. The difference between the groups were significantly different  $\chi^2(6, N = 356) = 62.2, p < .001$  (Appendix 7). Thus, not only is the hypothesis supported, but the analysis also shows a significant difference between those with low preference and high subjective knowledge compared to the rest of the groups.

<b>Answers Quiz</b>	<b>Group 1</b>	<b>Group 2</b>	<b>Group 3</b>	<b>Group 4</b>
<b>False</b>	75.6%	60.7%	87.8%	43.6%
<b>True</b>	8.7%	15.5%	6.7%	45.5%
<b>I don't know</b>	15.7%	23.8%	5.5%	10.9%

Table 8: Question 14 answers based on four-cluster solution.

### ***5.2 Research Question***

The findings from our research question summarizes the hypotheses and the most important aspect of this thesis. As a reminder, our research question was:

*How does consumers objective knowledge differ based on their preference for and subjective knowledge about organic produce?*

To answer the research question, we first created new variables for all the quiz questions where the answers was changed accordingly; True = 1, I don't know = 0 and False = -1. This enabled us to calculate a mean test score for each respondent which was used to evaluate whether a person had high or low accurate knowledge. Using the four-cluster solution and running a crosstab with the new quiz variable enabled us to examine which groups had the most accurate knowledge. We decided to divide the results in three different sections; those with below 0 in score (more wrong than right answers), those between 0 and below .36 in score, and those with a score of .36 or above. Looking at the results we decided that .36 in score would be appropriate for high accurate knowledge as the scores overall were very low. Also, according to the BI Norwegian Business Schools grading system this would result in a passing grade (above .35 in score = pass). The test was significant according to the chi-square test of significance ( $\chi^2 (66, N = 356) = 177.6, p < .001$ ) (Appendix 8).

The result of the analysis illustrated that in group 4 (high subjective knowledge and low preference) almost 70 percent of the respondents had a quiz score of .36 or above, while the other three groups had only 9.5 percent, 15.5 percent and 8.9 percent of the respondents achieving a higher score. The group with the lowest overall score was group 3 with high subjective knowledge and strong preference. This could be regarded as a major difference in their objective knowledge based on



their preference for organic food and subjective knowledge regarding the topic. High subjective knowledge and low preference people had more accurate knowledge than the other three groups: low subjective knowledge and preference; high subjective knowledge and preference; and, lastly, low subjective knowledge and high preference. Hence, consumers objective knowledge about organic food does differ based on preference for and subjective knowledge about organic produce. This result was also reflected in the analysis and results of the different hypotheses where those with inaccurate knowledge have a stronger preference for organic produce.

Score in quiz	Group 1	Group 2	Group 3	Group 4
<0	59.8%	48.8%	70 %	5.4%
>0 and <0,36	30.7%	35.7%	21.1%	27.3%
>0,36	9.5%	15.5%	8.9%	67.3%

Table 9: Quiz answers in percent based on four cluster solution.

## 5.0 Discussion

### 5.1 Conclusion

	Hypothesis	Results
H1:	<i>Frequent organic buyers are more likely than infrequent buyers to have inaccurate beliefs regarding health benefits of organic food.</i>	Supported
H2:	<i>Pro-organic consumers are more likely than organic skeptics to have inaccurate beliefs regarding the taste of organic food.</i>	Supported
H3:	<i>Pro-organic consumers are more likely than organic skeptics to have inaccurate beliefs regarding the sustainability of organic production.</i>	Supported
H4:	<i>Norwegian consumers, both pro-organic and skeptics, believe that most organic food is produced on small local farms.</i>	Supported
H5:	<i>Norwegian consumers believe that the animal welfare is significantly better in organic production compared to conventional production.</i>	Supported

Table 10: Summary of the hypotheses and the results.

Based on our survey responses we were able to support all the hypotheses (See table 10). This makes our findings consistent and enabled us to make an overall generalization that the general Norwegian consumer needs more information regarding organic produce. The findings detected different behavioral and preference patterns, but no significant difference in demographics was observed between the groups. Moreover, as mentioned in the findings section, people with a

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higher preference for organic food had the overall lowest objective knowledge level. Why could it be that those with stronger preference have lower knowledge? And what type of information should the Norwegian consumer receive?

The increasing health and environment trend in Norway has strengthened the sales growth of organic produce, where environmental factors are considered the most important driver for consumers purchasing behavior (Stortinget, 2017; Olson, 2017; MediaCom Insight, 2017). The fact that most organic media coverage could be considered pro-organic, may also have an impact on consumers viewpoints, resulting in an increasing demand for organic food (Landbruksdirektoratet, 2017b). All of this could have influenced the false belief regarding food miles, found in hypothesis 4, that most organic food is produced on small local farms instead of larger farms in remote distances. This may be the reason why many consumers still believe that the benefits of purchasing organic are superior to its counterparts, including Norwegian politicians (Stortinget, 2017). However, literature finds that it might not be as beneficial as consumers think.

We assume that this might be one of the reasons why people with less accurate knowledge have a stronger preference for organic food. Our results indicate that the general Norwegian consumer needs to be more informed regarding the advantages and disadvantages of organic food. This is also supported by MediaCom Insight's (2017) survey where 38 percent of the respondents wanted more information about organic food and agriculture. Feedback from our respondents was positive and several of the respondents were curious about our findings. This led us into multiple conversations with the participants, which indicates that the topic is of interest to the Norwegian population and that more knowledge is crucial for people to make consumption decisions.

Based on our findings, Norwegian pro-organic consumers are the least knowledgeable, compared to other consumers, about actual organic food qualities regarding taste, environment, and nutrition. Our findings suggest that pro-organic consumers should receive more information regarding the given topics. Nevertheless, even though pro-organics are the least knowledgeable, our findings also indicate that there is a general lack of competence in the marketplace. Hence, all consumers need more information regarding organic produce and its pros and

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cons. Basically, if the information communicated is accurate, the literature suggests that organic food is a waste of money and does not taste better (Hughner et al., 2007; Olson, 2017; Fillion & Arazi, 2002), is not healthier (Smith-Spangler et al., 2012; Brandt, 2012; Olson, 2017; Dangour et al., 2009), and is not better for the environment or the animals (Seufert et al., 2012; De Boer, 2003; Olson, 2017; Seyfang, 2006; Burt & Cash, 2007; Matmerk, 2018; Connor, 2008; Tuomisto et al., 2012; Mondelaers et al., 2009).

On the other hand, would politicians, organic farmers, and food producers want this sort of information given to consumers? In fact, consistent with our findings, we assume that they would want the opposite because uninformed consumers are their best customers. So, should Norwegian companies keep pushing organic food on the consumers? This touch upon ethical questions and brings us to an important discussion regarding strategic marketing decisions and how marketing and communication departments should communicate their organic food product portfolio. As consumers become more knowledgeable regarding organic food and production methods, marketing efforts to promote organic food using inaccurate presumptions could be considered unethical by consumers. Marketers should be aware of these changes in consumers' ethical beliefs (Honkanen et al., 2006). Therefore, the challenge is what should be the message and points-of-differences (POD's) on the marketing materials differentiating organic food from conventional food.

### ***5.2 Managerial Implications***

This research contributes to fundamental knowledge that is relevant for marketing organic food in Norway and can give direction to marketing departments, as well as wholesale and grocery stores in terms of their long-term marketing strategies. Even though research on the topic among Norwegian consumers is still in its early stages, the results and their implications should not be overlooked. So, what is the marketing challenge and how to communicate organic food?

The increased Norwegian consumer trend of purchasing organic food impacts consumers' attitudes, purchase intention and behavior when buying groceries. The article by Magnusson et al. (2001) mentioned earlier, argues that Swedish respondents have positive attitudes towards buying organic products, but the actual

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purchase rate is low. Based on our findings this could also be the same case for the Norwegian population. Hence, it is important to understand the customer journey and the underlying reasons for consumers to purchase organic produce instead of conventional food. It is crucial to craft a clear strategy based on facts. Additionally, marketers should understand the product attributes that can be used as POD's in marketing.

Our research finds that pro-organic consumers with inaccurate knowledge believe organic food has superior taste than conventional food. Hence, our finding is in line with Magnusson et al. (2001), who found that that the single most important purchase criteria for consumers is taste. Thus, this is an essential attribute to consider when marketing organic food. However, Norwegian marketing laws are strict in terms of misleading consumers on benefits and risks of the products (Lovdata, 2018), and as mentioned companies should consider the ethical issues stated earlier (Honkanen et al., 2006). Consistent with the findings in Honkanen et al. (2006) one cannot use taste, health benefits, and sustainability as PODs in traditional or digital marketing when differentiating organic from conventional food as this is not accurate information in terms of the research elaborated throughout the thesis. Then, how should politicians, organic farmers, and marketing managers create a positive attitude and increased purchase behavior around organic produce, without stating any inaccurate information and going against ethical aspects? Thus, should stakeholders and marketing departments relay on inaccurate knowledge and strong consumer preferences to increase the sale of organic produce or should they focus on other product attributes as key selling points to increase revenue? As you can see, several questions arise when bringing this issue to light.

Overall, to be perceived as an ethical company, marketing managers should, therefore, explore the dimensions of advertising creativity by adding novelty, meaningfulness, and relevance to their material. Thus, focusing on other product attributes to increase revenue, instead of relying on consumers inaccurate knowledge. One good example here is how the well-known Norwegian brand Tine, Norway's largest distributor of dairy products, markets milk without stating that milk strengthens your bones (Tine, 2018). Instead, they use athletes and collaborative partners (e.g., Kjetil Jansrud, Therese Johaug, Marit Bjørgen, Norges Idrettsforbund etc.) as their selling point in their communication to shape attitudes

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and purchase behavior (Kampanje, 2017). Norwegian consumers perceive famous athletes as having strong bones, thus identifying milk as a healthy option chosen by people who care about their health, bones, and physique. Also, the collaborations are built upon important mutual values between Tine and the athletes, strengthening their relationships and key marketing message.

### ***5.3 Limitations and Future Research***

#### *5.3.1 Actual Purchase Behavior*

In the current thesis, the focus was on consumers' subjective and objective knowledge as well as their perceived purchase intention. Hence, this implied that we did not look at the actual purchase behavior. Previous research by Magnusson et al. (2001) indicates that consumers report purchasing organic products more frequently than what the numbers based on actual consumption show. Thus, it is a reason to believe that the respondents in our survey have reported higher purchase rate because of social desirability bias. We believe that the social desirability bias can be accounted for by using other research techniques, for example, by looking at actual purchase behavior based on, for example, observations in further research. However, we leave this as an interesting research method for future research.

Another limitation in terms of purchase behavior might be the nature of our sample characteristics. Our sample consisted of 57.9 percent respondents under the age of 34, 67 percent live in cities and 89 percent have 3 years or more of higher education. This indicates that our sample is younger, urban and more educated than the general population. This group tends to favor organic and environmental products (Onyango, Hallman & Bellows, 2007), which could also have influenced the result of our study.

#### *5.3.2 Questionnaire Design*

As the selected language for the questionnaire was English, some of the Norwegian participants might have experienced a language barrier. This might have had an impact on their understanding of the questions, and thus their answers. The effect of the language barrier is nevertheless low, since we during our pre-test and main study received no feedback in terms of understandability of the language.

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### *5.3.3 Sample*

Furthermore, sample representativeness is always a concern in surveys. We are aware that our results are not generalizable for the whole Norwegian population. However, our national sample is representative enough, as we have a decent sample size with above 50 candidates in all groups. For future research, this could be considered, and the analysis could be sent out with help of TNS Gallup to get a generalizable sample. We also found it hard to collaborate with organizations working with organic food, as they were questioning some of our claims that we thought was important for our master thesis. Hence, some of the organizations and companies did not want to send out our study through their CRM database before we made changes in our questionnaire. However, in terms of market segmentation one can see out from our results that 109 respondents had high preference in terms of organic products. Hence, we can conclude that that the number of organic buyers is sufficient.

### *5.3.4 Knowledge Level*

Regarding the questionnaire testing the respondents' accurate knowledge, using dichotomous questions (true/false), the "correct" answers are based on our research findings, mentioned in the literature review (Appendix 3). Even though there is mixed evidence in the literature about organic products and production processes, the "correct" answers in the questionnaire was based on scientific articles that have a high validity. Nevertheless, there are only a few articles that discuss the advantages and disadvantages of organic products and production methods. Therefore, future research should focus on using different research methods and other population samples to strengthen the validity of the literature and the arguments on the organic food topic.

### *5.3.5 New Research Method*

As far as we know, the way of questioning the respondents including both subjective and objective knowledge in addition to preference, is a new type of research method. This survey set up could also be used for other interesting and trending topics that are strongly discussed among consumers and marketers such as high protein products (e.g., protein powder, protein bars). This could enable researchers and firms to identify other gaps in consumer knowledge regarding different product categories.

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### *5.3.6 Government*

Our thesis did not focus on government politics in Norway regarding the topic. The Norwegian government is focused on increasing the consumption of organic produce in Norway, based on the environmental and health benefits they perceive it to have (Vittersø & Tangeland, 2015; Bjørkhaug & Blekesaune, 2012; Stortinget, 2017, Regjeringen, 2018). Future research could test whether the consumers' high accurate knowledge regarding the topic are less likely to support pro-organic government politics and vice versa. Future research could also investigate the government aspect in more details. In terms of this, it would be interesting to distribute our questionnaire and test organic producers, the government working with organic produce as well as other "pro-organic" organizations (e.g Matmerk and Debio) on their accurate knowledge level on the given topic. However, it would might be hard to get cooperation.

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## 6.0 References

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## 7.0 Appendix

### *Appendix 1: Questionnaire for Main Study*

English 

Dear respondent,

This survey is part of a Master Thesis in Strategic Marketing Management at BI Norwegian Business School on the topic of organic food. The questionnaire will take approximately 5-8 minutes, and the data from the survey will be confidential and will not be used individually. The participation is voluntary, and to be able to qualify for the gift card you need to complete the survey and fill out your email in the end. By clicking on the button you have read and understood the above consent form and desire of your own free will to participate in this study. Please note that this survey will be best displayed on a laptop or desktop computer. Some features may be less compatible for use on a mobile device.

Kind Regards,

Ingrid Marker and Martina Nicole Naess.

Master of Science in Strategic Marketing Management, BI Norwegian Business School.

Thank you for your participation, your contribution will be appreciated!

[I consent, begin the study](#)

[I do not consent, I do not wish to participate](#)

[>>](#)

**Part 1: Please answer the following questions regarding your own knowledge and experience with organic foods. There are no right or wrong answers, we are only interested in your own viewpoints.**



I feel that I know more than the average Norwegian consumer about organic foods

Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
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I feel I have accurate knowledge about the difference in nutritional content of organic versus conventionally produced food

Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
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I feel I have a very good understanding of organic food production processes and standards

Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
-------------------	----------	-------------------	----------------------------	----------------	-------	----------------

I feel I have accurate knowledge about the environmental impact of organic food production

Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
-------------------	----------	-------------------	----------------------------	----------------	-------	----------------



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**Part 2: Please answer the following questions and choose the alternative you believe is correct, based on your own knowledge regarding organic foods.**



Most research shows that, in comparison to equivalent conventionally produced food:

Organic foods generally taste better

Organic foods generally taste the same or worse

I don't know

Growing organic food requires that:

(Pesticides = a substance used for destroying insects or other organisms harmful to cultivated plants or animals. Insecticides = a substance used for killing insects. Natural pesticides = made by other organisms usually for their own defence or derived from a natural source.)

No pesticides, insecticides, or other chemicals can be used

Some natural pesticides, insecticides or other chemicals can be used

I don't know

Most research finds that, in comparison to equivalent conventionally produced food:

Organic food production requires substantially more land be cultivated

Organic food production requires the same or less land be cultivated

I don't know

Most organic food is produced on:

Small local farms

Large corporate farms that are often a long distance away

I don't know

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Most research finds that converting global food production from conventionally produced to 100% organic would:

Not produce enough food to feed the entire world without major sacrifices

Produce more than enough food to feed the entire world and not require sacrifices

I don't know

Are there any product categories in Norway where organic foods have generally the same price as equivalent conventionally produced food?

Yes, some organic food is not more expensive

No, organic food is always more expensive

I don't know

Most research finds that, in comparison to equivalent conventionally produced food:

Organic foods have significantly more vitamins and nutrients

Organic foods have approximately the same vitamins and nutrients

I don't know

Most research finds that, in comparison to equivalent conventionally produced food:

Eating organic foods is substantially healthier

Eating organic foods offer no significant health benefits

I don't know

Most research finds that, in comparison to equivalent conventionally produced food:

Organic fruit and vegetables have significantly safer levels of chemical contamination from pesticides and insecticides

Organic fruit and vegetables do not provide safer levels of chemical contamination from pesticides and insecticides

I don't know



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Most research finds that, in comparison to equivalent conventionally raised animals:

Organically raised animals generally have a better quality of life

Organically raised animals generally do not have significantly better quality of life

I don't know

Most food produced in Norway is:

Organically produced

Conventionally produced

I don't know

**Part 3: Please answer the following questions based on your own feelings regarding organic foods.**



Organic food is a waste of money.

Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
-------------------	----------	-------------------	----------------------------	----------------	-------	----------------

Organic food offers significant health benefits.

Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
-------------------	----------	-------------------	----------------------------	----------------	-------	----------------

Organic food production is very environmentally friendly.

Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
-------------------	----------	-------------------	----------------------------	----------------	-------	----------------

Organic food production should be encouraged.

Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
-------------------	----------	-------------------	----------------------------	----------------	-------	----------------

Organic food offers good value for the money.

Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
-------------------	----------	-------------------	----------------------------	----------------	-------	----------------

Organic food production cannot feed the world.

Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
-------------------	----------	-------------------	----------------------------	----------------	-------	----------------

If a conventionally produced food item has a price of 10 NOK, what do you believe the price of an organic equivalent would be on average? (Please answer in NOK)



In the following categories, approximately what percent of your total food consumption is organic?

	0% - Never purchase	1% - 20%	21% - 40%	41% - 60%	61% - 80%	81% - Always purchase
% of fruits and vegetables	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
% of meat, fish, eggs, and dairy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
% of processed/prepared foods	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
% of non-dairy drinks and beverages	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
% food purchased in restaurants or cafes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
% of your overall food and drink consumption	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



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**Part 4: Please answer the following demographic questions.**



How old are you?

Under 25

25-34

35-44

45-54

55-64

Over 64

Do not want to answer

---

What is your gender?

Male

Female

Do not want to answer

---

Where do you live?

I live in the city

In the suburbs

In the countryside

Do not want to answer

---

Years of education beyond high school?

---

Approximate annual income?

Less than 150,000 NOK

150,000 to 299,000 NOK

300,000 to 399,000 NOK

400,000 to 499,000 NOK

500,000 to 599,000 NOK

600,000 to 699,000 NOK

700,000 to 799,000 NOK

800,000 to 899,000 NOK

900,000 to 999,000 NOK

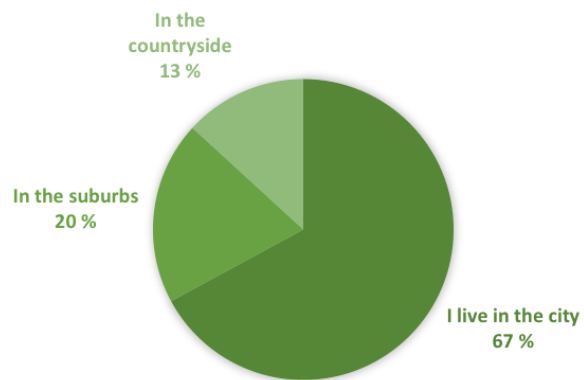
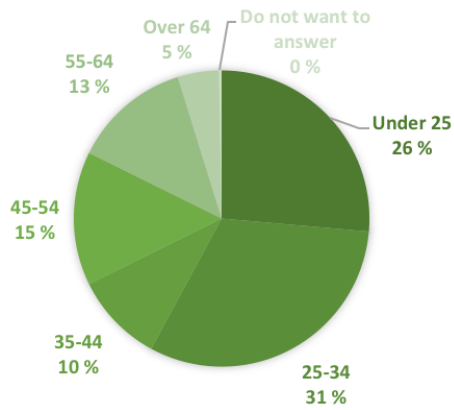
More than 1,000,000 NOK

Do not want to answer

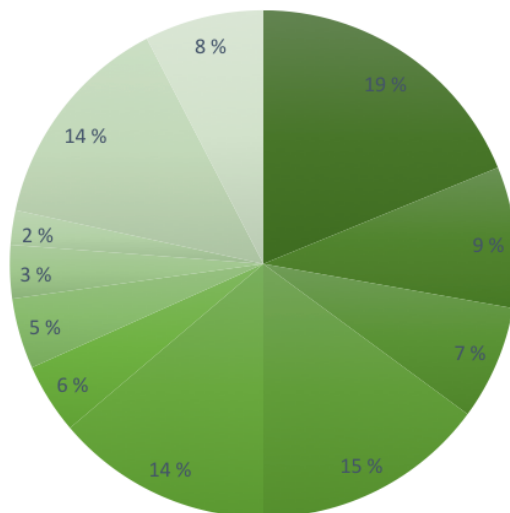


**Appendix 2: Descriptive Statistics**

**AGE**



- Less than 150,000 NOK   ■ 150,000 to 299,000 NOK   ■ 300,000 to 399,000 NOK   ■ 400,000 to 499,000 NOK
- 500,000 to 599,000 NOK   ■ 600,000 to 699,000 NOK   ■ 700,000 to 799,000 NOK   ■ 800,000 to 899,000 NOK
- 900,000 to 999,000 NOK   ■ More than 1,000,000 NOK   ■ Do not want to answer



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### Appendix 3: Part 2 – Correct Answer Sheet

**Part 2: Please answer the following questions and choose the alternative you believe is correct, based on your own knowledge regarding organic foods.**

>>

Most research shows that, in comparison to equivalent conventionally produced food:

Organic foods generally taste better

Organic foods generally taste the same or worse

I don't know



Growing organic food requires that:

(Pesticides = a substance used for destroying insects or other organisms harmful to cultivated plants or animals. Insecticides = a substance used for killing insects. Natural pesticides = made by other organisms usually for their own defence or derived from a natural source.)

No pesticides, insecticides, or other chemicals can be used

Some natural pesticides, insecticides or other chemicals can be used

I don't know



Most research finds that, in comparison to equivalent conventionally produced food:

Organic food production requires substantially more land be cultivated

Organic food production requires the same or less land be cultivated

I don't know



Most organic food is produced on:

Small local farms

Large corporate farms that are often a long distance away

I don't know



---

Most research finds that converting global food production from conventionally produced to 100% organic would:

Not produce enough food to feed the entire world without major sacrifices



Produce more than enough food to feed the entire world and not require sacrifices

I don't know

Are there any product categories in Norway where organic foods have generally the same price as equivalent conventionally produced food?

Yes, some organic food is not more expensive



No, organic food is always more expensive

I don't know

Most research finds that, in comparison to equivalent conventionally produced food:

Organic foods have significantly more vitamins and nutrients

Organic foods have approximately the same vitamins and nutrients



I don't know

Most research finds that, in comparison to equivalent conventionally produced food:

Eating organic foods is substantially healthier

Eating organic foods offer no significant health benefits



I don't know

Most research finds that, in comparison to equivalent conventionally produced food:

Organic fruit and vegetables have significantly safer levels of chemical contamination from pesticides and insecticides

Organic fruit and vegetables do not provide safer levels of chemical contamination from pesticides and insecticides



I don't know



Most research finds that, in comparison to equivalent conventionally raised animals:

Organically raised animals generally have a better quality of life

Organically raised animals generally do not have significantly better quality of life

I don't know



Most food produced in Norway is:

Organically produced

Conventionally produced

I don't know



**Appendix 4: Hypothesis 2**

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	77,912 <sup>a</sup>	6	0,000
Likelihood Ratio	75,109	6	0,000
Linear-by-Linear Association	4,311	1	0,038
N of Valid Cases	356		

a. 0 cells (0,0%) have expected count less than 5. The minimum expected count is 13,29.

**Appendix 5: Hypothesis 3**

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	67,431 <sup>a</sup>	6	0,000
Likelihood Ratio	73,392	6	0,000
Linear-by-Linear Association	31,100	1	0,000
N of Valid Cases	356		

a. 0 cells (0,0%) have expected count less than 5. The minimum expected count is 15,29.

**Appendix 6: Hypothesis 4**

<b>Chi-Square Tests</b>			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	6,595 <sup>a</sup>	6	0,360
Likelihood Ratio	7,008	6	0,320
Linear-by-Linear Association	0,048	1	0,826
N of Valid Cases	356		

a. 1 cells (8,3%) have expected count less than 5. The minimum expected count is 4,48.

**Appendix 7: Hypothesis 5**

<b>Chi-Square Tests</b>			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	62,154 <sup>a</sup>	6	0,000
Likelihood Ratio	54,256	6	0,000
Linear-by-Linear Association	0,205	1	0,650
N of Valid Cases	356		

a. 0 cells (0,0%) have expected count less than 5. The minimum expected count is 7,88.

**Appendix 8: Research question**

<b>Chi-Square Tests</b>			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	177,609 <sup>a</sup>	66	0,000
Likelihood Ratio	171,137	66	0,000
Linear-by-Linear Association	25,897	1	0,000
N of Valid Cases	356		

a. 64 cells (69,6%) have expected count less than 5. The minimum expected count is ,15.