Three stones, one bird?

A study of public support for meat-reduction policies in Norway

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Abstract

Objectives: This thesis explores support for two meat-reduction policies, and the effects that specific policy designs and frames have on the support for these policies. More specifically, I measure support for the policies: i. *a carbon tax on red meat*, and ii. *reduction in subsidies to red meat production*. The main objective is to assess whether the subsidy-reduction policy attains equally high resistance as the tax-policy. Furthermore, I explore to which degree *earmarking* tax revenues/*repurposing* subsidies - for various purposes that would alleviate concerns for increased economic inequality - can increase support for the measures. Finally, this thesis aims to determine whether *framing* the need for one chosen policy-design in terms of health, the national economy, personal economy, or fairness, can increase support.

Findings: My findings are based on two separate survey experiments that I designed and fielded through the well-known survey provider Norstat, which provides samples that are nationally representative on demographic characteristics, such as age, income, educational attainment, and geography. The findings indicate that people generally prefer subsidy-reduction policies more than tax-policies. Furthermore, the effect of earmarking/repurposing on support, strongly depends on the purpose of the earmark. Earmarking/repurposing for fruit, vegetables and berries, significantly increases support for both policies examined, while earmarking/repurposing for other (similar) purposes, do not. Of all the frames examined, only the *personal-economy* frame increased support for the chosen policy-design included in the framing experiment.

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Table of contents

Tables

Figures

1 Introduction

Joint fulfillment of the climate target for 2030 with the EU entails that, emissions in the non-quota sectors must be reduced by at least 50 per cent by 2030 compared to 2005. About 80 per cent of Norway's greenhouse gas emissions are covered by either quotas or taxes (or both). However, currently agricultural emissions are entirely evaded from such obligations (NOU 2015:15: 7). This is despite the fact that the sector was responsible for 8.7% of Norway's GHG emissions in 2017. The sector entered into a voluntary, non-binding letter of intent with the government in 2019, stating a sectoral-emission target of 5 mil. CO_2-ekv. in the period 2021-2030. This however did not describe in full detail exactly how the sectoral goal will be achieved, and the same applies to the governments recently launched climate plan. It is thus still open and unclear exactly how the target for emission-reductions in the sector actually will be achieved (Mittenzwei 2021 : 3).

For several years now, there has been an on-going public and academic debate on whether or not the current means utilized by the sector is sufficient in order to reach its reduction targets of 5 mill. CO_2-ekv. in the period 2021-2030. More than 70% of GHG emissions in the sector consist of methane and nitrous oxide emissions from ruminant digestion and manure, mainly from cattle and sheep (Grimsrud et al., 2019 : 256), and changing dietary patterns is thus considered as critical to reduce emissions from the sector through their impact on supply-side activities (Hayek et al 2020; Willett et al 2019; Popp et al., 2010). Policy instruments utilized by the sector thus far however, have mainly involved innovative technology and other methods to minimize GHG emissions from agriculture without reducing livestock production. This poses a political challenge, as the consumption of meat is unlikely to change significantly without the introduction of effective political instruments to incentivise behavioral change (Tangeland et al., 2020: 68; Grimstad Klepp et al., 2018 : 10; Austgulen et al., 2018 : 13).

Consequently, the need for some degree of policy intervention to promote sustainable food consumption have become the focus of both public debate and academic research. Some of

the debated means of intervention includes information provision through mandatory or voluntary labeling (e.g., Fahlman et al. 2008; Nissinen et al. 2007; Saarinen et al. 2012; Stutts et al. 2011), libertarian paternalistic choice architecture, (i.e., modifying food environments such as school cafeterias to "nudge" consumers towards healthier diets (Just and Wansink 2009; Just et al.2008; Sunstein & Thaler 2008), bans on specific foods (Gould et al. 2006), and price adjustments (i.e., policy initiatives that suggest price adjustments to reflect the social cost of food) (i.e., Cash et al. 2005; Vinnari and Tapio 2012; Wirsenius et al. 2011; Mittenzwei 2015). In particular, the latter instrument is considered to be effective for achieving behavior changes in the population (Bahr Bugge 2015 : 29), and state committees such as The Green Tax Commission have recommended price-adjustment policies as appropriate measures in order to reduce climate gas emissions associated with red-meat consumption.

However, if effective climate policies such as price adjustments are to be implemented by governments, they need to have support among the population.[1] Thus, previous studies have focused on examining support for a tax on red meat and whether certain policy designs entailing earmarking[2] (Grimsrud et al 2019; Bruvoll & Lindhjem 2021) or particular frames[3] (Helliesen, unpublished) may affect the support. The results from these studies shows that the public seems to be consistently generally negative towards this policy initiative compared to similar initiatives in other policy areas .

Building on this previous research, the main objective of this study is to examine the broad question: *What might affect public support for meat reduction measures in Norway?* In order to answer this question, three different strategies which may potentially affect public support for meat-reduction policies in Norway, will be investigated. Before I elaborate on what these three strategies entail, I will emphasize that this is a quantitative study, and in order to explore the research questions, I designed two survey experiments and fielded them through the well-known survey provider Norstat. Norstat provides samples that are nationally

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[1] A lack of support in the population is arguably preventing implementation of effective climate policies, and is thus a major barrier to realizing a transition to a low-carbon economy (Wiseman, Edwards, & Luckins, 2013).
[2] Earmarking is the practice of setting particular money aside for a specific purpose, and the strategy has shown to be effective at influencing policy support by previous studies on other policy-areas (Dresner et al. 2006; Hsu et al. 2008; Schade and Schlag 2003; Schuitema and Steg 2008; Steg et al. 2006; Thalmann 2004).
[3] Framing is the practice of selecting certain aspects of a problem or policy, and introducing it to one of several groups of respondents. Framing effects are when people`s views about the problem of policy change depending on how the problem or policy, is described.

representative on demographic characteristics, such as age, income, educational attainment, and geography.

The threefold objective of this paper is the following:

First, to examine and compare public support for the *two measures; i. carbon-tax on red meat,* and *ii. reducing subsidies to red meat production*, in order to determine whether the latter policy would attain equally high resistance. While previous studies have focused on examining support for the tax, the measure reducing agricultural subsidies to red meat production has been calculated to be able to achieve identical effects as the tax on meat in terms of altering consumer behavior and hence reducing greenhouse gas emissions[4], and, could theoretically attain higher support in the population than the policy; tax on meat has been able to attain (Helliesen, unpublished; Grimsrud et al. 2019; Bruvoll & Lindhjem, 2021). Numerous studies on public support seem to support the notion that "the nature of policies" matter for public support. For instance, respondents in survey questionnaires express negative attitudes to taxes in general as they consider the tax level to be more than high enough already (Dresner et al. 2006; Lindhjem, Magnussen, and Navrud 2013). In line with these findings, I will argue that it is plausible to assume that people would be more supportive of a *reduction* of subsidies to red meat production, compared to the introduction of a tax on red meat. Given the hypothesized assumption in this study, namely that the taxpayers would benefit from any given subsidy-reduction on their tax slip, this policy alternative would save the taxpayer from the "double payment" which the suggested tax would entail. In other words, the policy would not necessarily affect their personal economy negatively in the same way. Taxpayers already subsidize food production with about 11,000 annually in the form of taxes, most of which goes directly to meat production.[5] Although the subsidy-reduction measure would- similarly as the tax, inherently make the meat more expensive- it could at the same time become each taxpayers choice whether they want to spend the (reduced funds) suddenly to their disposal on maintaining current levels of meat consumption, or if they want to spend them on other healthier and more sustainable foods.

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[4] Model calculations made by Mittenzwei (2015) on behalf of the commission indicated that a reduction in either support, or a tax rate of NOK 410 - NOK 820 per tonne of CO2 equivalents in isolation can reduce emissions of total Norwegian greenhouse gas emissions by around 5-7 per cent compared with the reference path The effect was about the same regardless of whether the chosen instrument was reduced production support or tax on consumption.
Klimakur 2030 (2020). Tiltak og virkemidler mot 2030: p. 202
[5] Brunstad R. J., & Gaasland I. (2006)

The examination of support for these two measures will be based on some very specific recommendations from the Green Tax Commission- that we should price emissions from red meat on a par with the general tax level for emissions in Norway. In order to investigate support for these measures given this specific level of emission-pricing, I will utilize some calculations carried out by NIBIO.

The second objective of this study is to explore whether, and to which degree some previously un-researched forms of *earmarking* or *repurposing*, could increase support for the two policies; tax on red meat, and reduced subsidies to red meat production. Earmarking entails offering people the security that the money collected from the hypothetical tax, will be set aside for some other specified desired purpose, and there are strong and consistent results that this strategy may substantially increase policy support (Dresner et al. 2006; Hsu et al. 2008; Schade and Schlag 2003; Schuitema and Steg 2008; Steg et al. 2006; Thalmann 2004). Repurposing of subsidies essentially entails the same as earmarking, i e., reforming the means (FAO 2021: xvi) for other purposes. Previous studies show that increased economic inequality is the highest concern for people when it comes to implementing climate policies (Grimsrud et al 2019.,: 258). Thus, I will examine the effect of earmarking/repurposing for some specific purposes that could alleviate people`s concerns for increased economic inequality (Grimsrud et al 2019.,: 258),

Furthermore, the specific forms of earmarking/repurposing chosen for examination in this thesis, is based on what previous survey responses on the topic (i.e., support for a tax on red meat) shows potentially could increase support more relatively to other previously tested forms of earmarking (Grimsrud et al., 2019: 260). When asked in a survey questionnaire about what respondents thought earmarking (on the policy carbon tax on red meat) should be directed towards, the majority answered; for reducing the VAT on fruits and vegetables (Grimsrud et al., 2019: 260). However, policy support given this specific purpose of earmarking has not yet been examined. In addition to examining the effects on support of earmarking/repurposing for fruit,vegetables and berries, this study will also examine the effect of earmarking/repurposing means for other alternative food-products, these include; fish and seafoods, as well as vegetarian meat-replacers.

The third objective of this study is to examine the effect of different *frames* on support for one chosen meat-reduction policy design, in order to detect whether some of them are capable of increasing support for the measure, more than others. In other policy areas, studies have examined whether or not framing influences policy support, and found that this strategy sometimes may increase support for various measures. Different pieces of information related to the outcomes of red-meat production and the chosen policy-design will be presented to the respondents, in order to see if either of these `motivations` are able to engage people more relative to others. Do some arguments have stronger appeal among the respondents, and particularly, among people on the right, which according to theory are generally less supportive than liberals of effective environmental mitigation policies? (Harring & Sohlberg, 2017; Aasen, 2017)

More detailed information on how the two survey experiments were designed in order to explore these three strategies- will be provided in this thesis' methodology section.

Thesis structure

This thesis is organized into six main chapters. The chapters are again divided into different sections.

In the second chapter, some relevant background information about the various implications of current meat consumption patterns and developments will be reviewed, in addition to what barriers that stand in the way for behavior change towards more sustainable dieting. Furthermore, the chapter will contain some insights from agreements and reports that deals with the topic of what we *are and will* be doing to reduce emissions from the sector (Regjeringen, 2019; Klima- og miljødepartementet, 2021), how we *can* reduce emissions from the agricultural sector (Miljødirektoratet et al., 2020), and what we *should* be doing in order to reduce emissions from the sector (NOU:2015:5). The perhaps most important element of focus in this chapter is the latter of these, as it forms the basis of what will be investigated in this thesis; i.e., public support for the policy proposals from the green tax commission, that we should price greenhouse gas emissions from red meat on par with the general level for pricing emissions in Norway.

In the third chapter, theory on public support for effective climate policies generally, as well as theory on how one might increase support for unpopular but effective policies, will be presented. Not all of the theory presented in the chapter will be tested in this thesis, but is provided to give the reader an overview of the field.

In the fourth chapter, the research design will be presented (i.e., survey experiments), as well as the analytical approach of OLS modeling, before the data collection process is explained.

In the fifth chapter, the results will be presented and discussed, followed by a conclusion in the sixth and last chapter.

2 Background

The following chapter is divided into several sections.
Below, I will briefly explain how these sections relate to each other.

In this chapter, before I elaborate on the instruments that will be examined in this thesis, the focus will be on putting them into context. Thus, I will elaborate about; the global developments in demand for meat, the different consequences consumption of red meat has (in addition to negative effects on the climate), how the developments in demand have been like in Norway, the national goals we have to reduce red-meat consumption, and which barriers stands in the way of us actually acting in line with the recommendations to reduce the consumption of red-meat.

Furthermore, the chapter will provide insights from agriculture`s climate agreement with the government, as well as the government`s climate plan, with focus on the measures it contains for reducing emissions in the agricultural sector. This will be followed by a brief discussion on whether the climate plan appears to contain sufficient measures in order to realize the emission-reductions target determined in the sector`s climate agreement. If this is not the case, then there will be a need for other measures in order for the sector to reach it`s emission-target in full.

I then proceed by providing some information about the dietary measure presented in Klimakur 2030, and the effects of price adjustments on consumption patterns. Finally, I present the specific policy-recommendations from the Green Tax Commission regarding appropriate pricing of red meat, i.e., *the instruments for which support will be examined in this thesis*. Klimakur 2030 investigated the emission-reduction potentials of various measures that could be utilized by the agricultural sector (among others), and found that of all the measures available to the sector, a reduction in consumption (and production) of meat products in favor of other food products would have the greatest effect. The emission-reduction potentials that the dietary-measure could entail however, will depend on the use of other effective instruments incentivizing behavior change in the population. Price adjustments are considered to have the highest effect on dietary changes, and the Green Tax Commission has previously made some very specific recommendations of price adjustments

on red-meat. It is based on the Commission`s policy proposals that the survey experiments in this thesis will be designed. The exact instruments chosen for examination will be presented in section number 2.9.2, and 2.9.4. At the end of this chapter, I will provide some general information about the proposed measures that will be investigated, before I move on to the theory part.

2.1 Growing global demand for meat

The FAO (2011) predicts that global demand for meat will increase by 173% from 2010 levels by 2050, due to growing populations and incomes (FAO, 2011: 79, 82). Among drivers of meat consumption is the tendency of political and economic institutions to encourage animal agriculture (Dietz and York, 2015; Gunderson, 2011), in spite of its relatively low contribution to GDP, and importantly, increased affluency. In developing countries, rising economic growth translates into rising per capita incomes, and an emerging middle class that has purchasing power beyond their basic needs. As incomes grow, expenditure on livestock products grows rapidly (FAO 2006: 9). In light of this, the environmental impact per unit of livestock production must be cut by half, just to avoid increasing the level of damage beyond its present level (FAO 2006: xx).

2.2 Various implications from meat consumption

Current patterns of red-meat consumption entails many different implications. Although this thesis deals with support in the population towards implementation of effective measures to reduce climate gas emissions from red-meat consumption, such means would imply a triple dividend- meaning that they would also have positive effects on other matters such as health, and the national economy. In the coming sections, I will present these implications briefly one by one.

2.2.1 Meat consumption`s climate impacts

To ensure the nutritional needs of a growing population, it is necessary to produce more food. However, considering the pressures on the environment from current meat production, the question arises whether the increasing meat-demand can or should be met. The livestock

sector constitutes one of the top two or three most significant contributors to the most serious environmental problems, at every scale from local to global (FAO 2006 : xx), and is responsible for 18 percent of greenhouse gas emissions measured in CO2 equivalent globally (FAO 2006 : xxi). This means that the sector leaves a larger carbon footprint than the worlds entire transportation sector, and thus emit more than "every car, ship, train, and airplane on Earth" (FAO 2006 : xxi; Conniff, 2018). In Norway, the production of livestock accounted for 8.8% of the total emission accounts in 2019 (Miljødirektoratet 2021: 3, 50).

Emissions from the sector furthermore largely derives from consumption of meat and dairy products (Miljødirektoratet 2021 : 59). In Norway, methane emissions from the production of red meat alone (e.g., cattle, sheep/lambs and goats) constitute half of the emissions from the sector (Mittenzwei 2015 : 3). The cause of the emissions stem from the digestive system. Additionally, agriculture also contributes to indirect greenhouse gas emissions, such as deforestation to provide larger agricultural areas. When deforestation occurs, the forest's carbon stock is released so that the forest biomass has the same adverse climate effects as fossil energy sources (Dunne 2018). In the Norwegian emission accounts, this is not reported as emissions from agriculture, but under the sector land use, land use changes and forests (LULUCF) (NOU 2015:15 : 135).

A transition toward plant-based and low-meat diets has thus been emphasized as an important contribution to reducing climate change (Wolstenholme et al., 2020). Our current level of meat consumption is estimated to release about 10 times higher emissions than our vegetable consumption, holding the amount of goods equal (Thoring 2018 : 10). These large contributions highlight the potential of food related GHG mitigation strategies (Smith et al 2014), and the fact that dietary choices and consumption patterns are critical to reduce food system emissions.

2.2.2 **Meat consumption`s health impacts**

The evidence on the health impacts of high meat consumption is vast. It is associated with increased risk of developing a list of non-communicable diseases such as obesity (Rouhani et al., 2014), cancer (McMichael & Bambrick, 2005), heart diseases (Bernstein et al., 2010), diabetes (Micha, Wallace, & Mozaffarian, 2010), rheumatism (Fraser, 1999), Crohn disease

(Shoda, Matsueda, Yamato, & Umeda, 1996), and nutritional deficiency (Barnard, Nicholson, & Howard, 1995), and treating these involve high costs for governments each year. Too high consumption of red meat in Norway is the second biggest of the 14 dietary factors that contribute to the total disease burden (Helsedirektoratet 2018 : 32).

2.2.3 Meat consumption`s economic impacts

In Norway, the societal costs associated with consumption of red and processed meat constitutes a magnitude of NOK 30 billion. each year. At the same time, the societal costs associated with health damage due to too low intake of fruit and vegetables is estimated at around NOK 60 billion (Helsedirektoratet 2016 : 32). Not least because of the vast co-benefits of its mitigation, tackling climate change has been discussed as the greatest global health opportunity of our times (Watts et al., 2015).

2.3 National developments in demand for meat

Since the 1950s, the total consumption of meat has roughly doubled. Most of this increase occurred until the year 2000 (Animalia 2020: 40). The wholesale consumption of meat in total (including meat by-products) increased from 38 to 74 kilos per person in the period 1959– 2008 (Helsedirektoratet 2021: 20) It appears that the average Norwegian now eats approximately double ass much meat as the world average in a year (Rålm & Nagoda; 33). At the same time, the average in Europe for the intake of fruit and vegetables is much higher than in Norway (In 2013, consumption in Europe was 115 kg / person, while in Norway it was 77 kg / person (Mittenzwei et al., 2017 : 27).

While the consumption of meat in Norway has increased significantly over time and especially up to 2008, in recent years both the consumption of meat in total (including meat by-products) and red meat (pork, cattle/veal, sheep/lamb and goat/cow) has decreased only marginally. The population on average now follows the recommended maximum intake of red meat (Animalia 2020 : 124), however there are still large individual differences. The previous dietary survey which was conducted among adults in Norway (Norkost 3) found that the average intake of red meat and processed red meat products (calculated as raw weight) was approximately 815 grams a week among adults, approximately 620 grams a week among

women and approximately 1020 grams a week among men. In other words, only 45 percent of men, and 67 percent of women ate in accordance with the dietary advice to limit the amount of red meat and processed red meat products (Helsedirektoratet 2019b: 18), indicating that 55 percent of men and 33 percent of women eat more red meat than the recommended amount.

The dietary guidelines initially set on the National Action Plan for a better diet (2017-2021) are said to be fulfilled for society as a whole only if the dietary guidelines are fulfilled for each individual, not just for the population on average (Mittenzwei et al., 2020 : 7). Given that people who are above the dietary council reduce their meat consumption in line with the recommendations, while the rest of the population eats unchanged, this will roughly correspond to a reduction of the total Norwegian meat consumption by approximately one-third (Mittenzwei et al. 2020).

2.4 National goals to reduce meat consumption

What we know today about the dietary guidelines in light of sustainability considerations is mainly insight developed by the EAT-lancet group. The group brings together world-leadning researchers in nutrition, health, sustainability and policy from across the globe with the goal of reaching a scientific consensus on targets for healthy diets and sustainable food production, as well as necessary policy recommendations which will help to ensure that the UN Sustainable Development Goals (SDGs) and Paris Agreement are achieved. The conclusions drawn by this group have become presented through the report "Our Food in the Anthropocene: Healthy Diets From Sustainable Food Systems". In short, they have concluded that levels of red meat are far above what they should be from a sustainability perspective (i.e., no more than 98 grams of red meat (pork, beef or lamb) per week (Willett et al., 2019).

In Norway, one report has been produced in order to considered current Norwegian dietary advice from a sustainability perspective "Sustainable diet- assessment of the Norwegian dietary guidelines in a sustainability perspective 2017". Although the report concluded that a sustainable diet is largely in line with the recommendations for a healthy diet (Helsedirektoratet 2017 : 70), current national dietary guidelines are not based on

sustainability considerations. This means that as for now, the national goals to reduce meat consumption looks quite different from what they probably would have if the sustainability perspective also has been emphasized in the dietary-recommendations. Sustainability considerations will be included in the new Nordic nutritional recommendations that will be completed in january in 2022, and will form the basis for new dietary advice in Norway in the future (Helsedirektoratet 2020 : 49).

The Norwegian national health department`s goals to reduce meat consumption is in line with United Nations (UN) Sustainability Goal No. 12, which deals with consumption and production being responsible (Helsedirektoratet 2011 : 3,4,127). The UN's Sustainable Development Goals are a binding agenda for the next ten years, and the 2030-agenda`s sustainability goals form the political superstructure for all government's work nationally and internationally. The goal to reduce meat consumption in the population is also in line with recommendations from the World Health Organization (WHO), as Norway is obliged to act in accordance with the Global Action Plan for Non-Communicable Diseases (Helsedirektoratet 2019 : 7).

The Norwegian National action plan for a better diet (2017-2023) includes several dietary guidelines/recommendations for the population. The action plan includes quantitative goals for desired changes in the different aspects of the population´s consumption patterns, and the Norwegian Directorate of Health works to ensure that these goals are followed. The recommendations on red-meat is to limit the amount of processed meat and red meat to 500 grams per week (750g measured in raw weight), which corresponds to 2-3 dinners per week (Helsedirektoratet 2019b: 18). Red meat is defined as the sum of cattle, sheep / lambs and pigs, and the dietary guidelines for red meat therefore applies to the sum of the three types of meat. The three types of meat within the category (cattle, sheep/lamb and pigs) are different in terms of greenhouse gas emissions per quantity produced, and pigs for instance have lower emissions than cattle and sheep / lambs. From a sustainability perspective, the emission effect of a reduced intake of red meat will therefore depend both on the reduction itself, but also on how the composition of the three types of meat changes (Mittenzwei et al., 2020 : 7).

Other recommendations from the health directorate, includes to increase consumption of fruit and vegetables, fish and seafoods, and to choose low-fat dairy alternatives above full-fat

products. The last of these goals- of reducing saturated fatty acids, should arguably be seen in connection with the objectives to reduce meat consumption, as red meat is the second largest source of saturated fatty acids followed by the product group "dairy products" (Helsedirektoratet 2012 : 19,21; Helsedirektoratet 2021: 67). Consumption patterns of saturated fatty acids in the population is on average about 14 grams per day above the daily recommendations (Helsedirektoratet 2021 : 49).

2.5 Barriers to behavior change

Despite national goals to reduce meat consumption in the population, there are several barriers in the way for such a development. In this section, I will present the obstacles, which ultimately serves as a backdrop for why it is necessary to implement effective means to incentivize behavior change.

Within the literature on behavior change towards more sustainable dieting, the several barriers I have identified can be summarized as follows: unawareness of the problem associated with meat intake (Austgulen et al., 2018), uncertainty about what actually constitutes a climate friendly diet, concern for enough protein intake, preference for the taste of meat, lack of knowledge about cooking a vegetable based diet and convenience of following current dietary patterns, poor availability of alternative meat products, and high price.

The first and most obvious barrier to behavior change among the ones mentioned in this chapter, is inattention to the subject`s actual realities. Reducing meat consumption is considered by many to be less effective for reducing emissions from consumption compared to reducing electricity consumption or car use (Austgulen 2012). Another survey conducted at SiFo shows that consumers believe that reducing food waste and buying local products is more environmentally efficient and easier to carry out than reducing meat consumption (Bellika 2013). The respondents in the survey had little knowledge of the subject, and the greenhouse gas emissions from beef production were often ridiculed.

The lack of awareness of consequences associated with high meat intake may at least partly be explained by the fact that, there is a lack of consensus in the public debate on whether

reduced meat consumption actually is good for the environment or not (Austgulen 2014). This is perhaps not surprising, as there are very few examples of information measures where the purpose has been to reduce the intake of animal products, by better informing about the negative climate and health effects of these products. An exception was when the World Health Organization in October 2015 issued a recommendation to reduce meat consumption due to the risk of cancer, which made headlines in many Norwegian newspapers (Mittenzwei et al., 2017 : 27).

Furthermore, there is a common perception among many that a more vegetarian diet will not be able to provide enough nutrients, and people seem to be particularly concerned about not getting enough *protein*. Many people are not aware that plant foods contain a lot of protein, for example there is more protein in crispbread than in both fish balls and grilled sausage, and most vegetables contain proteins, especially broccoli, potatoes, spinach and Brussels sprouts, almonds even contain twice as much protein per 100 grams as canned liver pate (Lombardini & Lankoski 2013).

The top-rated reason underlying food choices in Norway reported in surveys, is taste (Markovina et al., 2015), and difficulties adopting a more sustainable diet is linked to preference for the *taste* of meat. Studies which have examined perceptions in the population about what limits increased consumption of fish and seafood in the period 2011 to 2014, show that 42% in 2014 believed that the reason was that they simply prefer the taste of meat (Bahr Bugge 2015 : 16). In other words, meat has gained a steady share of the space on Norwegians' plates, which is not exclusively due to structural factors such as price, selection and quality, but individual preferences (Bahr Bugge 2015 : 26)

According to a survey conducted by the information office for fruit and vegetables in 2015 (OFG 2016) many people also *lack knowledge* about cooking with vegetables. Closely related to this practical challenge, results from (Markovina et al., 2015) showed that the second most important reason underlying food choices in Norway was *convenience,* which preceded both health and price. These practical and structural challenges may however be mitigated by conversion to meat-substitute products since, in general, people are more likely to change habits if the new diet is similar to what they have today (Corrin and Papadopoulos 2017). A a potential switch to meat substitutes (products which mimic the

taste, texture and nutrition profile of meat)[6] could allow consumers to continue their established (convenient) cooking regimes, in the sense that they will not have to adopt new cooking skills or spend more time on cooking as the taste and consistency of meat-substitutes are more similar to what consumers are used to. Such products can have an important function in making it easier for some consumers to change their diet to a more plant-based diet.[7]

However, the market of meat substitute products is much more developed in countries we often compare ourselves to, in terms of domestic production, availability of products and technology involved (Gonera & Milford 2018) and in Norway, currently the *availability* of alternative meat products is quite scarce and makes up only about 2 percent of the total meat market (Gonera & Milford, 2018). This serves as a barrier for changing consumption patterns in and of itself (Tangeland et al., 2020: 62), and going forward, the development and availability of meat substitute products is important (Mittenzwei et al., 2017 : 21).

Last but not least, one of the most central barriers to adopting sustainable and healthy diets, is the *price*[89]. Price has been ranked as the second most important factor by respondents when asked about drivers behind food decisions (Grimstad Klepp et al., 2018 : 64). The price of meat is the one that has increased the least of all foods in the period between 1998 and 2015 (Mittenzwei 2017 : 23). Agricultural policy is of crucial importance for the type and amount of food that is produced and offered in the Norwegian market, as well as the price consumers ultimately have to pay in the store. Adopting new dietary habits would likely entail elevated costs (Miljødirektoratet et al., 2020: 19) depending on which foods meat would be replaced by. In general, meat analogues are priced as high or higher than meat from animals (Milford & Gonera 2018 : 16). When it comes to fish, the consumption is significantly lower than the goal set by the health authorities, which makes it very unfortunate that the consumer price index for fish has increased significantly more than it has for meat-products in recent years

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[6] Examples of processed meat-substitute options include, for example, minced meat based on soy and pea protein, vegetarian burgers, vegetable buns, vegetarian sausages, and ready-made dishes without meat (eg frozen pizza, lasagne, stews).
[7] A study from the Netherlands shows that processed vegetarian products are often used as a substitute for meat (De Boer et al., 2014).
[8] The private financial costs for households increase significantly with the transition to a diet with less consumption of red meat and a more plant-based diet (cereals, potatoes, fruit, vegetables, peas and nuts) and fish. Price for fish, fruit and vegetables can therefore be a barrier to behavior change (SØA 2019 : 17)
[9] Darmon and Drewnowski (2015) discover a tendency for healthy diets to be relatively expensive.

(Helsedirektoratet 2019b: 19). For vegetables, the price index has increased less than the average inflation, but still differs significantly from that of meat (Thoring 2018: 6).

2.6 Agricultures industry agreement with the Norwegian government

In 2019, the Norwegian farmers associations entered into a climate agreement with the government with the objective of setting a emission-reduction target for the period between 2021-2030, and outlining a plan for how the sector would achieve these. The intentional agreement between the farmers associations and the government was parted in two (Part A, and Part B), and the intention is that the combined effect of measures in both of these parts together should constitute the total emission reduction target. The target is set to 5. million tonnes CO2. equivalents in the period between 2021-2030 (Intensjonsavtalen, 2019)[10].

From the agreement it appears that the agricultural sector is responsible for the first part (Part A), while the government is responsible for the second (Part B). It is not specified exactly to what extent cuts from the various parts should occur, i.e., how large proportion of the emission reductions which should occur from the sector's work, versus from the government's work. It is nevertheless pointed out that the majority part of the emission-reductions in order to achieve the target- should derive from part A of the agreement (for which the sector itself is responsible).

The agreement contains a list of possible measures which the sector may utilize in order to contribute with their part (Part A) of the emission-reductions. The measures mentioned mainly consist of optimization of current production methods, and the sector stands free to choose which of these they wish to implement. The agreement is not legally binding.

The intentional agreement also mentions climate measures that the sector may implement, which are not covered by the emission accounts This is partly because no internationally approved method has been developed for calculating emission reductions of these measures thus far. Climate measures outside the emission accounts reduce emissions in reality,

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[10] The `Intentional Agreement` was established in 2019 between the farmers organizations and the state, and is a five-page document which lays out both the sector`s emission-reductions goal in the period 2021-2030, as well as available measures to reach this. The agreement is not legally binding, and underlines that the sector stands free to choose which measures they please in order to reach their emission-reduction goal.

however, we do not know how much, and since they are not included in the emission accounts, they will not contribute to meeting Norway's international climate obligations. Because of this, as for now, the use of such means can not be considered as reliable tools for reducing emissions from the sector.

The agreement furthermore stipulates that the government will contribute with it`s *unspecified* amount of cuts (Part B) through it`s work with behavior change in order to steer the population in the direction of following the official dietary advice, and food waste. However, since the effect of the various measures proposed in the intentional agreement was not quantified, it remains unclear to which extent they would be sufficient for the sector to reach its emission-reduction target. The government's climate plan however, should describe the means for achieving the sectoral emission-reductions target in more detail.

2.7 The Norwegian Climate plan for 2021-2030

The purpose of this section is to discuss whether the measures included in the governments climate plan appear to be sufficient in order to achieve the emissions-reduction target that was defined in the agricultural sector's industry agreement with the government (i.e., letter of intent, presented in the section above). To the extent that this is not the case, there will be a need to introduce further measures in order to ensure that the sector will achieve the emission-reduction target which was determined in the letter of intent.

The governments climate plan for 2021-2030 presents the planned policy interventions to reduce greenhouse gas emissions in the period in line with Norway's climate goals and in cooperation with the EU. A central element of the plan is to cut non-quota emissions (emissions from transport, agriculture etc.) by 45 per cent by 2030.

2.7.1 **Measures planned to be implemented by the agricultural sector itself**

The various measures which were mentioned in the climate plan as means for the agricultural sector to contribute with their part of the emission-reductions, fell within either of the following categories: 1) fossil-free farming, 2) better production and resource utilization, and 3) increased carbon sequestration. In the plan, the effect of these different measures were

quantified: 1,4 million tonnes from conversion to a fossil-free machine park, 0,4 million tonnes from conversion to fossil free heating of buildings such as barns and greenhouses, 330 000 tonnes from better use and storage of fertilizers, 250 000 tonnes from increasing the utilization of livestock manure for biogas to 25 percent in 2030, and 450 000 tonnes from banning new cultivation of bogs, where the reduction would be registered in both the agricultural sector (70 000 tonnes) and the land-use sector (70 000 tonnes) (Klima- og miljødepartementet 2021: 110-114). Together, the reduction-effects of these various measures amount to approximately 2.8 million tonnes CO2 eq. in the period 2021-2030. However, the agricultural sector`s goal for emission reductions towards 2030 is 5. million tonnes (Intensjonsavtalen, 2019)[11].

2.7.2 **The government`s contribution to emission-reductions in the sector**

Apart from the above mentioned quantified measures that will be utilized by the sector itself, the climate plan also contained a list of instruments that the government will put in place in order to contribute to their part of the emission-reductions as agreed to in the intentional agreement (Klima- og miljødepartementet 2021: 117). As mentioned earlier, the government will focus on food waste measures, as well as behavioral change measures to change the population's eating patterns. The measures mentioned in the plan to achieve emission reductions within these two areas, will be discussed separately below.

2.7.2.1 **Measures for food waste**

In order to achieve emission-cuts from food waste, the government will mainly focus on improving the information-work, also in kindergartens and the school sector. Additionally, the plan mentions intentions to further develop the work following from the industry agreement which was launched between the government and food chain in 2017 (Klima- og miljødepartementet, 2021: 118)[12].

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[11] The `Intentional Agreement` was established in 2019 between the farmers organizations and the state, and is a five-page document which lays out both the sector`s emission-reductions goal in the period 2021-2030, as well as available measures to reach this. The agreement is not legally binding, and underlines that the sector stands free to choose which measures they please in order to reach their emission-reduction goal.
[12] Bransjeavtale om reduksjon av matsvinn mellom myndighetene og matbransjen: https://www.regjeringen.no/contentassets/1c911e254aa0470692bc311789a8f1cd/matsvinnavtale.pdf

Within the industry agreement with the food chain (for the purpose of reducing emissions from *food-waste)*, the goal of 50 percent emission reduction within 2030 was stated. 103 businesses have signed declarations of support for the industry agreement on reduced food waste, and committed to measuring and reporting both the extent of food waste and the measures that have been implemented. The industry agreement with the food chain contains two sub-goals: First, 15 percent emission-reductions from food-waste by 2020, and second, 30 percent emission-reductions from food-waste by 2025. In the main report from 2020 however, it appears that more than ⅓ of the first of these two emission targets was not met, as the reduction in the period was only 9.5 per cent (Hovedrapport 2020: 19).

2.7.2.2 Measures for behavior change

In order to achieve emission-cuts from *dietary changes*, the government in their climate plan refers to the ongoing work (which, as mentioned earlier, is not very extensive)[13] rooted in the National action plan for a better diet (2013-2021/2023), and mentions that this will be further developed. Besides measures which concern improving the work with general information, the plan also lists intentions to gradually strengthen the work to promote knowledge of healthy and climate-friendly diets in schools and kindergartens. Also some structural instruments are mentioned such as ensuring that the public sector establishes climate requirements in purchasing meal services, and that they are considering establishing a model for cooperation on facilitating a healthy, sustainable and climate-friendly diet in counties and municipalities.

2.7.3 Accomplishment of the sector´s emission-reduction target

Since the government`s climate plan did not describe exactly how the agricultural sector`s emission-reduction target of 5. million tonnes will be achieved in full detail, this still remains open and unclear (Mittenzwei 2021 : 3). Although the measures outlined by the government to achieve food waste and behavioral changes- will be positive for achievement of the sectoral target, it is nevertheless unknown to what extent these measures actually will contribute to emission-reductions on the part of the government. The first sub-target for food waste was not reached, and it thus seems rather ambitious to expect that the effects following

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[13] Very few information campaigns have thus far been carried out to inform Norwegians about health consequences of high meat consumption (Mittenzwei et al., 2017 : 27)

from the work with the second sub-goal will be significantly higher. Unless large proportions of the remaining emission-reductions necessary for the sector to reach its emissions target, derive from this work, then they must derive from the work on attitude changes.

However, research shows that changes in attitudes are quite difficult to achieve, and that the most effective instrument apparatus is one that includes many different instruments at the same time (Tangeland et al., 2020: 68/69). The management efficiency that can be expected from information campaigns is low (Miljødirektoratet 2013: 140), and none of the measures included in the plan for achieving sustainable dietary changes are classified as particularly effective according to the Consumer Research Institute`s definition (Tangeland et al., 2020: 68).[14] The Norwegian Consumer Research Institute defines effective behavior-change policies in the area of meat-reduction as either, a tax on meat, changes in subsidies, bans on the sale of meat at a loss, regulation of the content and quantity of meat advertising, subsidization of meat substitute products, and attitude-creating emotional measures such as used on tobacco where packaging is added visible health information and environmental effects of meat consumption (Tangeland et al., 2020: 68).

To summarize, from the information given above, it may appear likely that further measures could become necessary to implement in order for the sector to fully reach its emission target of 5 million tonnes in the period.

2.8 Klimakur 2030

Klimakur 2030 was a report commissioned by the Norwegian Environment Agency, with the mandate to present possible measures and instruments that trigger at least a 50% emission reduction for all non-quota sectors in Norway in 2030 compared to 2005 levels, as well as measures and instruments for increasing carbon uptake and reducing greenhouse gas emissions in the forest and land sector (LULUCF). The report was the technical basis that the governments climate plan was based upon. The report was written across several directorates, and contains an unbiased selection of policy-recommendations based on calculations of reduction potential of various measures, as well as the relative cost of implementing them. In

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[14] Others point out that for measures to be most effective, they should be put as close to the source of the problem as possible. In the food area, this means that political measures should first and foremost be directed towards production, e.g., agriculture, fisheries and the aquaculture industry (Grimstad Klepp et al., 2018 : 10).

other words, the recommendations in the report were made regardless of political interest or concerns for popular opinion. In the report, 60 measures were investigated, which require both technological development as well as behavior change.

Out of all the measures in the report that required behavioral changes, the "dietary measure" was calculated to have the greatest emission potential, and it was also calculated to have the highest emission reduction-potentials out of all the measures available for the agricultural sector (Grimstad Klepp et al., 2018 : 2; Miljødirektoratet et al., 2020: 167). The dietary measure was estimated to be able to reduce 2.9 million tonnes of CO2 equivalents in the agricultural sector in the period 2021-2030, provided that a number of measures be put in place fast (Klima- og miljødepartementet, 2021: 1).

The measure would imply that the population adopted a diet in line with the dietary advice from the Norwegian Directorate of Health (p.192) for red meat , i.e., that people who`s consumption of meat exceeds 500g per week, and replace this with this with lower emission foods, such as fish, vegetables and plant based alternatives. If the people who are above the dietary guidelines reduce their meat consumption in line with the recommendations, while the rest of the population eats unchanged, this will roughly correspond to a reduction of the total meat consumption by approximately one-third (Mittenzwei, Walland, Milford, & Grønlund, 2020).

Although the dietary measure in Klimakur 2030 was calculated to be the most effective of those available for the sector in order to achieve emission-reductions, realization of the emission reduction-potentials within the dietary measure would indicate the need for new policies such as regulations, increased fees and subsidies (Miljødirektoratet, 2020: 23; Hovland, 2021). Effective policy-instruments such as these however, would require support in the population in order to be enforced.

2.9 Effective means for reducing emissions from meat-consumption: price adjustment policies

In previous sections I have showed that it is not entirely clear whether the sector will achieve its climate goals, and that the most effective measure that the sector can utilize
is to reduce the consumption of red meat in the population, as the dietary measure in

Klimakur 2030 illustrated. While there are a number of effective measures that can be implemented to reduce the consumption of red meat, and thus the emissions associated with this (Tangeland et al., 2020: 68), changing the price of food is perhaps the single factor that has the greatest significance for the demand for food (Bahr Bugge 2015 : 29).

State committees such as The Green Tax Commission have recommended price-adjustment policies as appropriate measures in order to reduce climate gas emissions associated with red-meat consumption. It is on the basis of these policy-recommendations that I will investigate support in the population for some selected measures in this thesis. Before I explain the content of these policy recommendations in more detail, I will elaborate on the effect of price-adjustments on consumption patterns in general, and the effect of price-adjustments on meat consumption in particular (i.e., meat elasticity).

2.9.1 Price adjustment policies

Price is the cornerstone of traditional economic thinking. The most basic theoretical models of supply and demand stipulate that in a simplified, perfectly competitive world dealing with standard products, an increase in price will result in a decrease in the quantity of the product sold, and vice versa. The available research evidence largely supports the economic theory in showing that changing the price of food can alter consumption in the desired direction (Niebylski et al. 2015, Capacci et al. 2012, Ball et al. 2015; WHO 2015 : 29). In particular, previous experiences with tobacco tax regulation underlines the positive effects that price changes may have in influencing purchasing behavior and ultimately, the negative implications related to it (Jha et al., 2006). When it comes to the effects of price increases on meat consumption specifically, some studies have found that the intention to eat meat decreases (Charlebois, McCormick, & Juhasz, 2016).

The fact that the price elasticity of meat is negative means that, low meat prices lead to increased consumption. Compared to other types of meat, beef (which is worst for climate and health) is particularly likely to be affected by price changes (Mittenzwei 2017 : 22). After a price change, demand elasticity will often be higher in the long run than in the short run. Eating habits, such as eating meat, are established over many years and can take a long time to change. However, if the price of meat is persistently high, the consumer will eventually

look for substitutes for meat. It is common to assume that demand for white meat, vegetable products or meat substitutes increases if prices for red meat rise (Mittenzwei 2015 : 7). Furthermore, the more close substitutes there are to a product that receives a price change, the more elastic the consumption will be (NOU 2019:8 : 81).

2.9.2 The Green Tax Commission`s policy-recommendations for appropriate pricing of Co2-emissions from red-meat consumption in Norway

In 2015, the Green Tax Commission had been assigned a task from The Ministry of Finance, to assess existing environmental taxes worked as intended, remove the taxes that worked poorly, as well propose new, effective environmental taxes. In other words, whether and how a green tax restructuring and changes in support schemes can contribute to better resource utilization and fulfillment in line with the objectives of "klimaforliket". The committee's findings were presented in the report "Sett pris på miljøet" in 2015.

The commission concluded in this report that we should price all climate emissions in agriculture, and that the level of price-increase on red meat should be set at a rate similar to the general tax-level for GHG emissions in other sectors in Norway (NOU 2015:15: 68). If the level of price-increase on red meat is set at a rate similar to the general tax-level for GHG emissions in other sectors in Norway, this would entail to set a general tax level of NOK 420 per tonne of CO2 equivalents. A fee on level with the new, general tax level for greenhouse gas emissions is calculated at NOK 7.4 per kg red meat, converted into 2016 kroner (NOU 2015:15: 109). However it was emphasized that the levy must increase over time to reach the goals of the Paris Agreement (NOU 2015:15: 68,69). The level of the fee can be based on a life cycle consideration of the emissions from the animals.

Furthermore, in order for meat-products to be priced in lines with the general level of emission pricing in Norway, the commission recommended that it would be appropriate to both introduce a special tax on red meat (beef, sheep / lamb and goats, not pigs), as well as to reduce production support to livestock, as both these measures will be able to help reduce domestic consumption (and hence production) of red meat (NOU 2015:15: 14,15, 166). The two measures are considered to be equally cost-effective means for reducing emissions and

contributing to Norway fulfilling its international obligations (NOU 2015:15 : 7).

2.9.3 **The polluter pays principle**

The recommendations from the Green Tax Commission regarding the introduction of a tax on red meat as well as a reduction in subsidies for red meat production, was based on a principle called the "polluter pays principle" (NOU 2015:15: 9). The `polluter pays` principle is a socio-economic principle that was first adopted by the OECD Council in 1972 in it`s Recommendation on Guiding Principles Concerning International Economic Aspects of Environmental Policies. The purpose behind the principle was to constitute a common basis for member countries' environmental policies, ensuring that they would encourage rational use and the better allocation of scarce environmental resources. The principle states that the polluter should bear the expenses of carrying out the pollution prevention and control measures introduced by public authorities in member countries, in order to assure that the environment is in an acceptable state (OECD 2022: 3,4).

Where the market encourages the consumption of products with a documented negative impact on climate, the government should want to correct for these tendencies (EEA 1996: 3). This will provide incentives to reduce the behavior while at the same time making it more profitable to develop new and better alternatives. Greenhouse gas emissions resulting from red meat consumption will negatively inflict people in different parts of the world. These are external effects to society that neither the producers (agricultural sector) nor the consumers (red meat eaters) cover, and there is no penalty or mechanism for those affected to be compensated.

2.9.4 **Model calculations from NIBIO**

Model calculations that the Norwegian Institute for bioeconomy (NIBIO) has carried out on behalf of the Green Tax Commission (Mittenzwei 2015), illustrates the consequences of possible measures to reduce greenhouse gas emissions from the production of red meat (NOU 2015:15: 137). Among other measures (Mittenzwei 2015: 12), it was investigated in what order of magnitude we can expect emission-reductions to occur if the two instruments- tax on red meat, or reduction in agricultural subsidies to red meat production- were utilized. The

findings of the report (Mittenzwei 2015) indicate that the effect was about the same regardless of whether the chosen measure was reduced production support or a tax on consumption (Miljødirektoratet et al., 2020: 202). In other words, they would have approximately the same effect on the consumption and production of red meat (Mittenzwei 2015 : 18).

It is these calculations that form the basis for the survey experiments which will be conducted in this thesis. More specifically, the two policy-scenarios from the report (AvgLik, and Til410) are those chosen for examination (of public support) in this thesis. The background for the choice of these simulations, is that the subsidy-reduction policy scenario (Til410) and the tax policy scenario (AvgLik) involved comparable levels of emission-pricing, i.e., a price increase on red meat corresponding to NOK410 per tonne of CO_2 from red meat production (Mittenzwei 2015 : 11,12), a level that is roughly the same as that recommended by the Green Tax Commission (i.e., 420 NOK per tonne of CO_2-equivalents) (NOU 2015:15: 68, 69).

When it comes to the subsidy-reduction policy scenario (Til410), reduced subsidies currently directed towards red meat production at a rate of around 10 percent was estimated to bring similar effects as the cost-effective level of a tax on meat (Mittenzwei 2015 : 27). When the subsidies are reduced, the development in consumption coincides with the development in production (Mittenzwei 2015: 28), i.e., the costs of the production will be pushed downwards onto the consumers. The two policy-scenarios would both entail approximately the same price increase of 7,18 NOK (2015 kr) per kg of red meat, which ultimately is what triggers the reductions in consumption. The rates applies to cattle/veal and sheep/lamb (Mittenzwei 2015 : 15) Both of the policies could, in isolation, be able to reduce the greenhouse gas emissions from the Norwegian agricultural sector in an order of about 5 per cent in the period, compared to the reference trajectory, i.e., not having implemented the measures in the period (Mittenzwei 2015 : 27; NOU 2015:15: 137).

2.9.5 Section on the policy: Carbon tax on red meat

As mentioned in the preceding sections, one of the central policy proposals of the Green Tax Commission was that we should introduce a tax on red meat. It is not only the Commission however, that has proposed that we should introduce a tax on red meat. Also The Norwegian

Green Party, with the support of a number of environmental organizations- has proposed that we implement a tax on climatically harmful foods, such as meat. It has been discussed various ways of how such a tax can be arranged (Willett et al., 2019), and considered that an increase in the price of meat is preferable to a reduction in the price of fruit and vegetables (Abadie et al., 2016). Out of the different tax proposals which have been discussed when it comes to pricing emissions from red-meat, a main distinction can be drawn between the possibility of introducing a producer tax, or a consumer tax. The tax proposal which has been recommended introduced by the Green Tax Commission (NOU:2015:15), is a consumer tax, and a consumer tax is also what was examined in the NIBIO report (AvgLik), which is the specific tax-policy scenario that will be examined in this thesis. Nevertheless, I will explain the difference between the producer and the consumer tax below, in order to give a little more context to what will be examined.

2.9.5.1 **Producer tax**

The policy suggestion of a *producer tax* would entail adding a climate tax per kilo of beef produced, which would reduce the income of farmers, and incentivize them to produce and offer a lower quantity of meat each year going forward. The livestock population would decrease over time as a result of reduced production, stimulating emission-reductions. If Norway had been a closed economy, the introduction of a producer tax would have led to a decrease in meat consumption in Norway. However, since Norway is an open economy that can import goods from abroad, the amount of beef consumed would likely remain unchanged as imports could simply increase according with raising Norwegian prices. If foreign countries have to increase production to meet Norway's demand, foreign emissions will increase as a result of Norwegian climate policy. This effect is called carbon leakage, an effect Norway wants to limit.

2.9.5.2 **Consumer tax**

A supplementary instrument which may decrease consumption and simultaneously prevent measures from leading to increased imports, is the *consumption tax*. Consequently, it is mainly this instrument which has been considered for implementation in Norway. Even if the

consumer tax is imposed on consumers, the intention is still to reduce Norwegian production. As long as Norwegian farmers obtain the same price for their products as before, they will not- according to economic theory, change their production patterns, and thus the emissions from agricultural production will remain the same. A consumer tax on meat would entail that the consumer pays a higher price for red meat in the shop, and as a consequence of the

decreasing demand, the farmers will produce less of the commodity. If the consumption of

red meat in Norway decreases, we will consequently import less from abroad. If this leads production in the importing countries also to decrease, their emissions will be reduced, and in this way reducing Norway's consumption can contribute to reducing emissions also in other countries.

There are a few different ways in which the consumer tax could be arranged. These include either adjusting the VAT rates, using the `special charge´ system, or changing tariffs (Bahr Bugge 2015 : 29) Foods currently have a low VAT rate (15 per cent), while the general VAT-rate on goods is 25 per cent. Rather than establishing a new tax, the VAT rate on (red) meat could be set at the normal rate, while other foods continue at a low VAT rate (Bahr Bugge 2015 : 30). Alternatively, a special tax can be imposed on red meat, which is what the Green Tax Commission proposed that we should utilize in order to reduce emissions from these products.

2.9.6 Section on the policy: Reduction in subsidy support for red meat production

As presented in section 2.9.2, the other key proposal from the Green Tax Commission was that we should reduce agricultural subsidies for the production of red meat, and as explained in detail in section 2.9.4, this is one of the measures which support for will be investigated in this thesis. In order to give some context to what is being examined, the coming section will elaborate on; policy-recommendations for agricultural subsidies which have been given by international bodies, what effect subsidies have on consumption, the magnitude and composition of the level of support in Norway, and the positive externalities which the current support-level for red meat is commonly justified on the basis of.

Reducing agricultural subsidies have been a much discussed measure both in the public

debate (Kleveland, 2021; Ringheim, 2019; Svendsen 2021; Rustad 2021) as well as the academic literature (Pettersen et al., 2017; NOU 2015:15; FAO 2021; Sievert et al., 2021; Gaasland 2010). The Green Tax Commission`s proposal of reducing subsidies to red meat production, is also in line with recommendations from other bodies such as the European Commission and the United Nations Agricultural organization.

The European Commission have stipulated that transforming the food system – including reducing production and consumption of red meat – will "require a package of food systems policy interventions to achieve the dietary targets along with targeting consumer behavior change, including among others removing agricultural subsidies and attenuating livestock production" (Sievert et al., 2021 : 8). Similarly, the Food and Agriculture organization of the United Nations recent report "A multi billion dollar opportunity - repurposing agricultural subsidies to transform food systems" state that

> *"Agricultural producer support needs to be repurposed and reformed to support a transformation of our food systems and the achievement of the SDGs. Repurposing is defined in this report as a reduction in agricultural producer support measures that are inefficient, unsustainable and/or inequitable, in order to replace them with support measures that are the opposite. This means agricultural producer support is not eliminated but reconfigured."* (FAO 2021 : xvi,124)

2.9.6.1 The effect of subsidies on meat-consumption

The reason that the measure of reducing agricultural subsidies to red meat production, have become a subject of heated debate, is that the current support scheme to meat products stimulates volume production while keeping prices down, and as a consequence, both production and consumption become "abnormally high" (Gaasland 2020 : v). Removing parts of the subsidies to red-meat production would lead the prices of mass produced animal-derived products to more closely reflect their true production costs. If such a policy-scenario was realized, the consumer would have to pay a higher price for the meat in the store, and the farmer would have to withstand a lower producer price (market price plus subsidies). Overall, this would lead the composition of consumption to change (Gaasland 2020 : vii,viii).

In addition to distorting production and consumption decisions for the particular production that the subsidies are linked to (FAO 2021 : xvi), subsidies create disincentives towards producing healthier and more nutritious foods- such as fruits and vegetables, and have a tendency to penalize the availability and affordability of more diversified and nutritious food (FAO 2021 : xvii). The subsidies on intensive meat-production also counteracts the effect that any tax (designed to improve the environmental impact of consumption) potentially could have (EEA 1996 :38). Furthermore, the subsidies ultimately leads resource waste to occur, since production takes place at a cost that exceeds consumers' valuation (Gaasland 2020 : v,2).

2.9.6.2 Norway`s agricultural-support levels in international comparison

In international comparison, Norway seems to be the *number one* country with highest support levels as percentage of production value (FAO 2021 : 32). The most distorting and environmentally and socially harmful subsidies is identified by the United Nations Food and Agricultural Organization, and appears to be *producer support* (i,e., price incentives, and fiscal subsidies tied to the production of a specific commodity) (FAO 2021 : xiii; xvi). In Norway, it appears that almost half of the support is price incentives to individual farmers, and the bulk of the other half of Norwegian subsidies consist of fiscal subsidies tied to a specific commodity (FAO 2021 : 32)

Although Norwegian agriculture is generally not a very profitable business (Bruvoll & Lindhjem 2021 : 15), in 2014 the industry received about 14.6 billion NOK in support over the expenditure side of the national budget. This accounted for over 60 per cent of the total national budgetary support to the business community. In addition, the sector received taxpayer covered subsidies of approximately 1.2 billion NOK, and around 10.2 billion NOK estimated from shielding support deriving from import protection. Thus, in 2014 the total amount of agricultural support was estimated to amount to approximately 26 billion NOK (NOU 2015:15 : 135).

Out of the total subsidy support that the Norwegian agricultural sector receives, 94 percent goes to production of animal products (meat, milk and eggs), 47% go exclusively to the

production of *red* meat, while only 6 percent goes to production of plant products which may be consumed directly (Gaasland 2020 : vii).

As a weighted average across all counties and productions in Norway, the subsidies amount to 38% of the production value (the farmer's sales income plus subsidies). This means that when a Norwegian consumer buys food from the farmer for NOK 100, he pays NOK 62 while the community pays NOK 38 of the bill. However, due to the large variations of subsidy support distributed among different productions, this leads to great variations among the price for different products in the store. For instance, when a Norwegian consumer buys lamb, he pays only 1⁄4 of the production costs while the taxpayers cover 3⁄4 of the bill.

2.9.6.3 The various purposes of agricultural subsidies

The reason why the measure has been so controversial in the public debate, as well as in the political arena, is that subsidies for animal husbandry can be justified on the basis of positive externalities or positive public goods.

Among other goals like *self-sufficiency*, the scale and composition of the current subsidy scheme also contribute to *settlement/employment* throughout the country, and the *preservation of the cultural landscape*. The first of these three goals is perhaps the one which has been the most disputed in the public debate. However, Nordlandsforskning for instance, has calculated that with a 30 per cent lower meat production in Norway which is roughly in line with the dietary advice, the degree of self-sufficiency can increase from the current 50 per cent to up to 80 per cent (Vangelsten 2017). AgriAnalyse has also calculated that one can produce 16 percent more food, measured in energy, by agronomically optimal utilization of all available agricultural land in Norway. It means growing more cereals and pulses at the expense of grass in areas that are suitable for it (Arnoldussen et al., 2014). This is also in accordance with the findings from (Abrahamsen et al., 2019).

The second and third purposes that the current subsidies simultaneously serve are those which are the least compatible with a shift in production. Farms in the northern areas of the country are mainly producers of red meat as the natural conditions for producing other foods

are not optimal. Additionally, parts of the cultural landscapes in these areas which is currently grazed on would become unused if subsidies to red meat production was reduced. Since it is desirable to have settlement throughout the country, as well as a rich cultural landscape, the grants are often discussed as means also to these ends.

Although the goal of settlement and rural lifestyle are regarded as common goods that require special support schemes in order to be taken care of to the desired degree, it is well established that the most socio-economically effective way to ensure this is by general income support to all the inhabitants or general wage subsidies to all business activities in an area (Brunstad & Gaasland 2006 : 46). Furthermore, although grazing ensuring a well-kept cultural landscape is valued as a positive externality, in the case that other negative externalities (like global warming, or public health) are valued at the same time, it is defendable that the total subsidy support per animal should be somewhat lower than it is today.

3 Theoretical expectations and hypotheses

The theoretical chapter will first and foremost contain theory on public support for policies, as well as theory on the concepts that are relevant to the investigations in this thesis; how to increase support for unpopular climate initiatives. The chapter will be parted into five sections. The hypotheses which will be examined in this thesis, will be presented intertwined with the theory.

As portrayed in chapter 1 , the first objective of this thesis is to investigate support for two different measures which can be thought to have different levels of support in the population. Thus, in the first section of the theoretical chapter I will present some theory on acceptance of policy instruments in general. This theory shows why it is interesting to examine and compare support for the two different instruments of focus in this paper; in short this literature shows that people seem to prefer some policy instruments above others, and that the cost of the policy seems to matter for policy support.

In the second section of the theoretical chapter, I will proceed by presenting some theory closely related to this purpose of the thesis- on the political divide that climate policies seem to attain. This theory shows that people on the right side of the political spectrum with individualistic values, tend to be more sceptical against climate change as well as supporting climate change initiatives.

In the third section, I will present some theory on what might explain the political polarization in support for climate policies. This theory suggests that, those on the right may be more positive about introducing the measure; reduction in agricultural subsidies, than what they are to a tax on red meat, as the tax policy presumably would conflict more with their underlying ideological perceptions regarding connections between politics and economics, ie., perceptions of negative effects of market regulation on economic prosperity.

The fourth and fifth sections of the theoretical chapter should be viewed in context to each other. These sections contain theory on the two concepts *earmarking* (i.e., altering the policy design), and *framing* (i.e., communication strategy) which are both closely tied to the theory of acceptability. Both these two "techniques" are generally associated with the potential to increase support for necessary but unpopular emission reduction policies (Kundzewicz et al.,,

2020; Petrovic et al., 2014; Dresner et al. 2006; Hsu et al. 2008; Schade and Schlag 2003; Schuitema and Steg 2008; Thalmann 2004), however in previous studies examining support for the carbon tax on red meat, they have only been utilized separately (Grimsrud et al., 2019; Bruvoll & Lindhjem 2021; Helliesen, unpublished). Two particularly interesting questions which emerge from this literature, will be examined in this paper: First, whether or not earmarking the tax revenues (or repurposing subsidies) for some previously untested purposes which seem highly relevant (Grimsrud et al., 2019) could possibly increase support for the two policies which will be examined (i.e., the tax and the subsidy reduction policy). Second, whether or not framing on the policy; reducing agricultural support to red meat production, including some original and highly relevant frames, could possibly increase support for that policy.

3.1 Theory on preferences for environmental policies

There is vast literature on public support for environmental taxation in general. Key determinants of policy support for climate instruments in general, which may be identified in the literature, includes: self interest (Heres et al., 2015; Stern et al. 1993), i.e., whether or not the policy will hurt or benefit oneself, distributional concerns- i.e., that the policy does not contribute to increased economic inequality (Grimsrud et al.. 2019; Kallbekken and Sælen 2011; Thalmann 2004), perceived environmental effectiveness (Kallbekken & Sælen 2011; Dresner et al., 2006), and perceived coerciveness (Baron & Jurney 1993; Groot and Schuitema 2012). Out of this literature, the most relevant for this thesis is theory on the *cost of the policy,* which relates to previous research on the effects of self interest.

When it comes to public support for effective measures that may reduce emissions from red meat consumption and production in particular, most of these focus on support towards the carbon tax (Bruvoll & Lindhjem 2021, Grimsrud et al., 2019, Helliesen, unpublished). Much less research is available on public support towards reducing agricultural subsidies- although this policy is calculated to have the same effect on consumption (NOU 2015:15: 14,15), and could involve fewer costs for people. The following sub-section will show why it is interesting to compare support in the population for these two measures. In other words;

"*It may be that people are in principle willing to act environmentally friendly and consequently reduce CO2 emissions provided that such behavior is not associated with higher financial costs, as is common nowadays.*" (Steg et al., 2006: 106)

3.1.2 **The cost of the policy: Taxes are seldom welcome**

Previous research have found that expectations about a policy`s consequences influence attitudes towards that policy (Fishbein and Ajzen 1975, Eagly and Chaiken 1993), and that policy costs are likely to be associated with support levels (Shwom et al., 2010; Harring et al., 2019). For instance, findings from (Steg et al 2003; Steg & Vlek 1997; Schade 2003; Stradling et al., 1999), shows that "push measures" which make environmentally unsound behavior more expensive are generally less accepted by people compared to "pull measures" which make environmentally friendly behavior less expensive. Also findings from De Groot and Schuitema (2012) support this as they found that policies that subsidized low-carbon options were more accepted than policies that imposed a direct cost on polluters, as the latter

were seen to be more coercive in restricting polluting behavior. Studying preferences for environmental policy measures in Norway, Tvinnereim and Steinshamn (2016) even found that direct regulations are regarded more favorably than taxes.

(Heres et al., 2015) examined whether perceived effectiveness, or expectation of higher relative personal gains could explain the higher support for subsidies than taxes. Their findings indicate that the preferences for subsidies over taxes are due to participants expecting that the subsidy will increase their own payoffs more than a tax, but not because it is expected to be more effective in changing behavior (Heres et al., 2015 : 4). These findings seem to be in line also with those from Aasen et al (2019), showing that the vast majority of the Norwegian population do not want their own economy being affected by the "green shift".

Another particularly interesting study suggests that not only the introduction of subsidies are preferred above taxes, but also a reduction of them is (Dietz & Shwom 2007).
Dietz & Shwom (2007) examined support for eight policies proposed to reduce the burning of fossil fuels, and found that the respondents overwhelmingly reported that they would prefer to shift subsidies away from fossil fuels and towards energy strategies, above implementing a tax on gas. Furthermore, a majority of respondents supported all the mitigation policies with the exception of taxes on gasoline and "gas guzzlers".

In light of the above-mentioned theory in general, but especially the findings made by Dietz & Shwom (2007), it is interesting to investigate support for the measure; reduction in agricultural subsidies to red meat production. If the cost of policies matters, it is conceivable that also the measure; *reducing subsidies to red meat production,* may be viewed as more favorable than the equivalent tax policy, and thus render higher acceptance.
Agricultural subsidies are already paid for through the indirect and less visible income taxation. Although the two policies (tax versus reduction in subsidies) will have approximately the *same effect* on a price increase per kg purchase of red meat in the store, and thus on consumption patterns and it`s associated greenhouse gas emissions, there is a crucial difference between them: In addition to the fact that the subsidy-reduction measure

may seem less coercive and deterrent[15] compared to the "tax policy", the question of reducing subsidies entails less financial pressure on the consumer, who simultaneously, at least in theory *if the design of the instrument so requires*, will experience a tax cut.

The suggested carbon tax on red meat entails that the consumer has to pay for the meat twice, i.e., *double taxation*. First, the consumer would have to pay for the red-meat through the tax bill (from which all food subsidies derive), then she would additionally have to pay a fee (covering the determined price on emission costs) when purchasing the red meat in the store. The other policy however; reduction in subsidies to red meat production, could entail that money is *received*. The reduced amount of tax-funded subsidies that would "normally" go to red meat production, could simply just be deducted from the total sum of food subsidies expected to be paid by each taxpayer annually. In such a scenario, the taxpayer would have become slightly richer as a part of the subsidies they normally would pay, would remain intact in their accounts. Although the red-meat in the store would become somewhat more expensive, the consumer could decide for herself whether she wants to spend the "additional" funds on the slightly more expensive meat, or on other foods.

If the support for the subsidy question is higher than support for the tax-policy, this might indicate that the costs of the policy matters.

H1: The policy (reduction in subsidies to red meat production) attains higher general public support than the policy (carbon tax on red meat).

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[15] Results from Kallbekken & Sælen (2011) shows that even different kinds of labeling (of the same policy) may affect support. The word "fee" increases support relatively to the equivalent instrument called "tax".

3.2 The political divide on environmental support

The previous section presented theory on which factors that have been found to influence preferences for policies in general. In addition to the fact that the cost of the policy may have an effect on support, also political affiliation is of great importance for support of effective climate policies in particular. It is this political polarization that I will discuss in this coming section.

Previous studies suggest that in particular, socio-political variables such as values, ideologies, worldviews and political orientation are important determinants of pro-environmental behaviour (Austgulen et al., 2018 : 7) and policy support for pro-environmental policies (Harring, Jagers, & Matti, 2017). People on the right side of the political spectrum with individualistic values tend to be more sceptical against climate change (Dunlap & McCright, 2008) as well as supporting pro-environmental initiatives (Harring & Sohlberg, 2017; Severson & Coleman, 2015). For instance, conservatives are found to be linked with positive meat attitudes and meat consumption (Dhont & Hodson 2014)[16] as well as negative attitudes towards increasing the prices of meat (Austgulen et al., 2018 : 7/8; Helliesen, unpublished:, 24). Although much of this research derive from the US context which is particularly polarized across partisan divides, the same tendency have found to be present in the Norwegian context (Bruvoll & Lindhjem 2021; Krange, Kaltenborn, & Hultman, 2019; Aasen, 2017; Aasen & Vatn, 2018). Thus, I expect to see a similar distinction based on political affiliation (left-right divide) when it comes to support for both policies/all the policy designs examined in this thesis.

H2: Reported placement on the left side of the political spectrum increases support for both policies (i.e., the tax and the subsidy-reduction policy), compared to reported placement on the right side of the political spectrum.

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[16] Right-wing adherents do not simply consume more animals because they enjoy the taste of meat, but because doing so supports dominance ideologies and resistance to cultural change (Dhont & Hodson 2014).

3.3 Theory on political polarization in support for environmental policies

In the section above I presented literature showing that political affiliation affects support for pro-environmental policies. In this section I will present literature on possible explanations for this association.

Due to the phenomenon`s polarization (i.e., right-wing voters are less likely to support pro-environmental policies), it is believed that disagreements around climate change is probably more over values than the underlying science (Corner et al., 2014; Hulme, 2009). In attempts to explain the divide, some arguments have been put forward.

3.3.1 **Two different ideas of freedom and the proper role of the state**

Feinberg and Willer (2013) have found that environmental attitudes and political ideology may be explained with the tendency that conservatives do not have the same moral concerns as liberals when it comes to the environment.[17] At the core of divided attitudes around what fundamentally right or not however, when it comes to the collective-action problem of choosing appropriate climate solutions, lies two different ideas of liberty and thus, the proper role of the state[18][19]. While libertarians hold the libertarian core idea that individuals have rights, and that those rights are what fundamentally determine right action (Nozick 1974), much of the concern regarding climate change cannot be reconciled with a rights-oriented paradigm, as climate change is the result of *joint* human emissions (Shahar 2009:. 234).

The idea of distinguishing between a "positive" and "negative" sense of the term liberty dates at least back to Emmanuel Kant, and was examined by Isaiah Berlin in the 1950s and 60s (Berlin 1969). The negative freedom perspective which is commonly held by libertarians, entails the belief that concern for *individual autonomy* (e.g., the ability to make free and rational decisions about how to lead one's life) places strong limitations on the activities of the state, which should not interfere to restrict choice. Viewed through the libertarian lense then, liberty is the *absence* of obstacles external to the agent, which is free if no one is

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[17] While the contemporary environmental discourse largely is based on moral concerns related to harm and care, liberals endorse the harm/care and fairness/reciprocity domains more than conservatives do (Feinberg and Willer 2013: 57, 61)

[18] Analyzing conceptualizations of freedom in the German climate policy discourse, Worm (2022) found that the concept determines discourse via the counter-concept of bans that potentially restrict freedom (Worm 2022: 49). The 'individualist' discourse focuses on the value of freedom of choice (in consumption) and freedom from regulatory measures (Worm 2022: 11).

[19] Libertarians have raised some heavy criticism of the state. For an overview on this, see Brennan (2012).

stopping them from doing whatever they want to do (Nozick 1974).

Liberals at the other hand interpret the political ideal of liberty from the positive-freedom perspective, view autonomy not as something that individuals have by default as long as no one interferes with them, but rather as the possession of capacity and resources to act upon one`s free will (or take the rational option) in the context of the broader society, which often places limitations on one`s ability to act. The perspective recognizes other less obvious barriers to liberty (both internal and external), and freedom then requires the *presence* of something (i.e., awareness, determination, self control, financial assets). In the absence of this, concern for individual autonomy may therefore justify interventions that foster these abilities (Griffiths & West 2015: 1095) such as informational measures, subsidizing some activities (in order to encourage some options) above others, or introducing taxation (with earmarking) in order to finance this.

3.3.2 **Two different views on market regulation and how to achieve economic prosperity**

Another reason behind the political divide in support for environmental policies which has been pointed out in the literature, is its association with *market regulation* which generates skepticism among right-leaning individuals (Harring & Sohlberg 2017 : 281). Right-wing individuals tend to dislike political involvement as well as taxes (Drews and van den Bergh, 2015; Kallbekken and Aasen, 2010), while pro-environmental policies are more compatible with left-wing individual`s ideological belief that the market economy needs to be regulated and that the government should play a role in society (Harring & Sohlberg 2017 : 281). The difference in views on market regulation is closely tied to completely different beliefs about how to achieve economic growth and thus a desirable level of prosperity. The disagreement revolves mainly around "*whether this is to be achieved through tax raises or tax cuts, or through cuts or increases in (social) consumption of investment*" (Heise, Lierse 2011 : 10).

The reasoning behind these two different views on market regulation derive from the two underlying theories of contradicting assumptions that they are based upon; The `liberal market model` with its ties to the neoliberal agenda, and the`social market model` (See Hayek 1948 : 22; Ravenhill 2008 : 366; Empter & Shupe : 12; Wrobel 2010 : 6,10). The marriage between the framework of neoclassical supply-side economics and the implementation of political policies, i.e., "right wing policies" entail the belief that a lean

welfare state and policies such as tax cuts (in addition to low minimum wages, flexible working hours, flexible labor markets and decentralized collective bargaining) will encourage people to work and businesses and entrepreneurs to create new jobs, and thus a "trickling down" of resources will occur, enhancing economic growth, competitiveness, restoring full employment, and reducing public debt (Hermann 2014 : 124).

Thus, there is a theoretical rationale behind the effects of ideology on environmental support; for right-wing people, `environmentalism represent a challenge to the traditional emphasis on economic prosperity` (Dunlap et al. 2001 : 34; McCright and Dunlap 2011a; 2013). They do not necessarily oppose all environmental protection, however they commonly view economic concerns and environmental concerns like a seesaw - i.e., as one rises, the other one falls *(Carman 1998, p. 721,* cited by Harring & Sohlberg 2017 : 281).

It may be inferred from the above that, right-wing people who hold individualistic values could respond more strongly (opposed) to a tax policy than a reduction in subsidies, as the tax policy would presumably conflict more with their underlying ideological perceptions regarding connections between politics and economics. Furthermore, if support for the two policies do not differ among right-wing individuals, this might indicate that opposition in this policy domain rather is due to ideas of personal autonomy. Right-wing individuals then may view consumption of meat foremost as a personal issue that the state should not stick its nose in, regardless of the perceived economic repercussions of the policy suggestions.

H3: People on the right side of the political spectrum are more likely to support the subsidy-reduction policy, compared to the tax policy.

3.4 How to increase support for unpopular but effective climate policies: Earmarking may help

As explained in chapter 1, the objective of this thesis is to examine three different strategies which may potentially affect public support for meat-reduction policies in Norway. The first of these three strategies was elaborated on in the sections above; namely why it could be interesting to examine and compare support for the unpopular tax on red meat with support for a measure that has previously not been examined; a reduction in agricultural subsidies for red meat.

The second of these strategies, is what will be of focus in the coming section: to examine different policy-designs (which entails earmarking the tax revenues, or repurposing of the subsidies), as the literature shows that this potentially can increase support for the two measures in question (i.e., the tax policy as well as the subsidy reduction policy). I will begin this section by introducing the concept of earmarking, before presenting findings from the previous studies on the area of earmarking on the policy; tax on red meat. The purpose of presenting these studies is mainly to show how effective previous studies on the topic (i.e., public support for meat reduction policies) have found earmarking to be on support, and which new forms of earmarking these studies conclude (potentially) may yield higher public support than other previously examined forms of earmarking.

3.4.1 **What is earmarking, and why is it effective?**

As a response to the stubborn opposition towards effective climate policies, one approach researchers have resorted to in attempt to increase the support for policies, puts emphasis on the *design* process. Giving respondents the opportunity of earmarking revenues from new taxes (e.g., offering them the security that the money collected from the hypothetical tax, will be set aside for some other specified desired purpose) researchers are able to construct policies which make the initially unpopular pay-policy seem more agreeable. The government revenues from carbon and environmental taxes may be directed toward a variety of purposes. There are strong and consistent results that earmarking the revenues from environmental taxes for environmental purposes substantially increases their popularity (Dresner et al. 2006; Hsu et al. 2008; Schade and Schlag 2003; Schuitema and Steg 2008; Steg et al. 2006; Thalmann 2004). For illustration, Sælen and Kallbekken (2011) finds that

without earmarking the majority of the people would prefer to reduce the fuel tax rate, whereas with earmarking the majority would prefer to increase the tax rate by about 15%.

Several explanations have been put forward to explain the effects of earmarking. One idea which has been put forward, is that the reason earmarking is so popular is that without earmarking, taxpayers have no clear idea of that the money is spent on, and fear that it is spent "wastefully or even fraudulently, or that a substantial part of it goes for services of which they disapprove" (Rivlin 1989). Another explanation is that, if people do not believe that environmental taxes will improve the environment by altering behaviour, then earmarking the revenues for environmental purposes might increase the perceived efficiency of the policy, i.e., reducing emissions (Kallbekken & Sælen 2010 : 2). (Dresner et al. 2006) actually found that the effectiveness of carbon taxes does not seem to always be internalized by the general public, and when tax revenues are not set aside for the same purpose, most people feel that carbon taxes are just a pretext to raise fiscal revenues.[20]

These different explanations for the connection between earmarking and effect would entail that all the measures which entails earmarking/repurposing in this study, should experience increased support. The forms of earmarking/repurposing are fairly similar, in the way that they all involve funds being distributed among various climate-friendly alternatives, ensuring people that money is not wasted fraudulently, or spent on something entirely different from what the purpose of the initial instruments was supposed to serve.

H4: The policies that include earmarking/repurposing in this study will attain higher support than the policies without earmarking.

3.4.2 **Previous studies on earmarking & meat reduction policies**
Two studies have been conducted previously in Norway on the particular topic of willingness to pay (WTP) for a carbon tax on red meat.

The first is Grimsrud et. al (2019). This study previously investigated public acceptance of

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[20] Sælen and Kallbekken (2011) define this problem as "issue-linkage", i.e., the need for the public to see a straightforward and logical nexus between the tax and the use of revenues.

and willingness to pay (WTP) for a tax on red meat and city traffic in Norway. The focus of the study was to measure public acceptance of the cost-effective levels of the taxes,[21] and whether some specific forms of earmarking could increase acceptability. The forms of earmarking they examined was *public benefits* versus *private benefits* (i.e., whether earmarking the tax revenues for environmentally friendly technology versus reduced income tax) would be able to increase acceptability. The respondents were told that they would first be questioned about their acceptance of tax without any earmarking, and then their acceptance if the tax revenue was earmarked (Grimsrud et al., 2019).

Despite being informed about the purpose of the tax, only 27 percent of the respondents in the study agreed that a tax on red meat should be implemented. When it comes to the effects of earmarking, earmarking the tax revenues for environmentally friendly technology did increase accept for the tax on red meat, while earmarking for reduced income tax did not increase acceptability.[22]. They concluded that earmarking only had a limited effect on the level of acceptance for the taxes. At the same time, the authors reveal that a limitation with their study was that only respondents who had accepted the tax without eatmerking were asked if their WTP would increase with earmarking, while research shows that acceptance increase with initial earmarking (Grimsrud et al., 2019: 265).

The study nevertheless revealed two interesting things, which is particularly interesting for this thesis and the development of the policy-designs which will be examined:
First, that the main concern for people when it comes to policy design, is *distributional concerns,* i.e., concerns that the policy could lead to increased economic inequality (Grimsrud et al 2019.,: 258). Several other studies also confirm the importance of distributional concerns when it comes to policy support (Kallbekken and Sælen 2011; Thalmann 2004; Baranzini et al., 2000; Zhang and Baranzini 2004). Kallbekken and Sælen (2011) for instance found that, in addition to perceptions about climate effects from potential taxes, peoples considerations for negative distributional effects on others are the main concern which renders most in

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[21]The tax-level examined was based on recommendations from the Green Tax Commission regarding pricing emissions from meat per kg in line with the general tax level on GHG emissions in Norway (NOK 420 per tonne CO2 equivalents) (Grimsrud et al., 265). They calculated this to amount to NOK 12 per kg red meat (Grimsrud et al., 2019: 257), which is quite higher than the amount calculated by NIBIO, i.e., approximately NOK 7 per kg (NOU 2015:15: 109, 137; Mittenzwei 2015 : 11,12,19,27/28).
[22] This is in line with Kallbellen and Asen`s (2010) finding that focus group members in their study expressed that they preferred that there be a connection between what is taxed and how the tax income is used.

opposition to suggested environmental taxes. Thalmann (2004) found that, the probability of a yes-vote for a green proposal is substantially lower when the proposal implies a clear increase in inequalities.

Second, the study revealed that most of the survey respondents actually would prefer that the earmark from a potential tax on meat would be dedicated towards the purpose of reducing the tax rate (VAT) specifically on fruit and vegetables. Supporting agriculture was reported as the second preferred purpose of earmarking (Grimsrud et al., 2019: 260). If the people who initially rejected implementation of the tax were surveyed, given earmarking for the most desired purpose reported by the respondents, the general support for the policy examined (carbon tax on red meat) might have been higher.

That the respondents expressed preference for earmarking tax revenues from a potential tax on red meat production for this purpose (i.e., reduction in the price of fruit and vegetables) makes a lot of sense in light of the findings above showing that distributional concerns is the main concern for people regarding questions of policy-design (Grimsrud et al 2019.,: 258). A price increase on meat would particularly hit the poorest part of the population, and it is those that to the largest degree would have to either reduce consumption of red meat or spend a greater degree of their income in order to maintain current consumption patterns (Mittenzwei et al 2019., : 65).

The second study worthy of review in this section, has been conducted by Bruvoll and Lindhjem (2021). In this study, the authors examined what those who are for or against climate taxes *in general* think of as most important to use the tax revenues for. The study also included survey questions about support for a tax on red meat, given the possibility of earmarking the tax revenues for various different purposes.

The results from this study shows that there is great variation among the groups of people (who are for, neutral or opposed to implementation of climate policies) when they are asked about what they think that income from climate taxes should be used for. Overall however, most of the respondents would prefer that tax-revenues are directed towards financing other climate measures, i.e., climate friendly investments in industries (Bruvoll & Lindhjem 2021:

32,19). This is also in line with other findings from the literature on acceptability, which quite unanimously show that when it comes to climate taxes, most people think that tax revenues should be used to finance other climate measures (Bruvoll & Lindhjem 2021: 22; Hsu et al. 2008; Schade and Schlag 2003; Schuitema and Steg 2008).

Furthermore, Bruvoll and Lindhjem (2021) also examined support for climate pricing in specific areas, and asked respondents about (among many other different measures) support for the specific measure- carbon tax on red meat.[23] They asked the respondents which was initially opposed to implementation of the carbon-tax policy- whether or not they would change their mind, if the income from the tax was earmarked for some "specific prioritized purposes" i.e., not simply for reducing general public expenditure (Bruvoll & Lindhjem 2021: 32,33, 28).

The possibility of earmarking the tax revenues did not move mountains compared to the initial policy suggestion of taxing red meat consumption, without earmarking. Although public support compared to the initial (non-earmarked) measure increased, it did so only very limited. Comparing support before and after earmarking, roughly the same number of people opposed implementation of the measure. Support for the policy without the opportunity of earmarking the tax revenues was approximately 24%, while 48% opposed the measure, 8% did not know and 20% would support it "depending on what the revenues is used for". After being presented with the opportunity of earmarking the tax revenues, support for the policy was still 24%, while 47% opposed the measure, 14% did not know and 15% were for "if the revenues are used for certain specific purposes" (Bruvoll & Lindhjem 2021: 36,37).

Earlier in the study, the respondents could all choose three preferred purposes that they would like revenues to be directed towards (Bruvoll and Lindhjem 2021: 30). However, it would not be possible to place the earmark on all the preferred purposes listed by respondents (Bruvoll & Lindhjem 2021: 32). The question asked about support for the carbon-tax policy in Bruvoll and Lindhjem´s (2021) survey thus, seems to provide us with insight about to which degree support for the carbon-tax on red meat can increase given the *general* possibility of earmarking. Findings from Grimsrud et al., 2019 however, illustrate how

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[23] The figures given beneath for support examined by Bruvoll & Lindhjem is based on a tax level of NOK 8 per 400g minced meat (Bruvoll & Lindhjem 2021: 36).

support for measures may vary based on what they are earmarked for in particular (for instance, earmarking for climate friendly technology increases support, while it is not the case when it comes to earmarking for lowering the income tax).

To sum up, the reviews of both studies above appears to show the same general picture; namely that support for the carbon-tax policy has shown to be persistently low. Furthermore, it also seems that the possibility of earmarking revenues for previously selected purposes not have been able to elicit much support for the policy, compared to support for the policy without earmarking. Despite the fact that the tax level which was examined by Grimsrud et al., (2019) was higher (NOK 12) than that for which support was investigated by Bruvoll & Lindhjem (2021) (NOK 8), the level of support for the carbon-tax on red mead found by Grimsrud was higher (27%), than it was found to be by Bruvoll and Lindhjem 2021 (24%). Although both studies reviewed above concluded that the carbon tax-policy did not obtain support in the population, there are some reasons why it is still interesting to examine support for the measure; carbon tax on red meat. First, in order to compare support for the carbon-tax on red meat with support for the measure; reduction in agricultural subsidies for red-meat production in Norway. Second, to examine the effects of some previously un-tested forms of earmarking on support for the policy.

The different forms of earmarking/repurposing which will be chosen for examination in this thesis, is chosen based on what previous literature on the topic (i.e., support for a tax on red meat) shows potentially could increase support more relatively to other previously tested forms of earmarking (Grimsrud et al., 2019: 260). Based on the findings from Grimsrud et al., (2019), I have chosen to examine effects of earmarking the tax revenues from a carbon tax on red meat, *and* repurposing the available means from the policy; reduction in subsidies to red meat production, for the following purposes: i. reducing the VAT (ie., price) on fruits, vegetables and berries ii. reducing the VAT on fish and seafoods, and iii. reducing the VAT on alternative meat products.

As shown in the sections above, people are particularly concerned that climate policy designs will have negative distributional consequences for people (Grimsrud et al 2019.,: 258; Kallbekken and Sælen 2011), and in the design of such policies, in addition to ideally not leading to increased economic inequality, they should be related to the purpose that the

measure is initially intended to serve (i.e. that there is a connection between climate policy and earmarking for additional climate purposes) (Kallbekken & Sælen 2010 : 2). The policy designs chosen for examination in this thesis, appears to be consistent with both of these conditions. The chosen policy designs which will be examined could on the one hand alleviate negative distributional effects- or increased economic inequality[24], through making other foods cheaper at the same time as they make meat more expensive . On the other hand, it could simultaneously encourage behavioral change towards healthy and sustainable diets, which could to some extent lead to additional emission-reductions.

It has been much discussed within the academic literature whether rather than making animal foods more expensive, one should make complementary foods more affordable (Mittenzwei et al., 2017 : 19). Although vegetables and fish are relatively less price elastic than meat and dairy products (SØA 2019 : 6,7) meaning that in and by itself, lowering prices on healthy and environmentally sustainable foods would be a much less "efficient" measure than the equivalent of raising the price on un-healthy and un-sustainable foods (Bahr Bugge 2015: 30), the extent of further growth in demand for sustainable and healthy food products presumably also largely depends on the prices of these alternatives (Gonera & Milford 2018 : 20).[25][26] The positive effects of reducing prices on consumption of sustainable foods particularly applies to meat substitutes. A study of the climate potential that lies in meat substitution has found that demand begins to rise after a 10% price reduction, and that at a price reduction of 75% the consumption of meat will decline with 40-45% (Ritchie, Reay, & Higgins, 2018).

H5: The possibility of earmarking/repurposing subsidies to reduce the VAT on fruit, vegetables and berries, increase support the most relative to other policy designs.

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[24] (Mittenzwei et al., 2019: 65).

[25] For instance, Gustavsen & Rickertsen (2013) have found that if the price of fish and fruit is reduced, those with the lowest consumption will increase their consumption the most. A 1 per cent price reduction on fish will lead to increased consumption of 1.4 per cent (Guvstavsen & Rickertsen 2013).

[26] The grocery chain Kiwi has tried the strategy of reducing prices on fruit and vegetables as well as fish products during promotional periods, coupled with information campaigns focusing on benefits on health and the environment, which has led to a 24% (fruit and vegetable) and 42% (fish) increase in sales during the campaign period (Miljødirektoratet et al., 2020: 202).

3.5 How to increase support for unpopular but effective climate policies: Framing may help

The third strategy that will be examined in this thesis is, as stated in chapter 1, framing effects on policy support.

The concept of framing will first be introduced, followed by a review of which frames previous framing-studies suggest may be promising in order to increase public support in general (and among people to the right side of the political spectrum particularly, who usually oppose climate initiatives the most). A number of studies have investigated what type of arguments are best suited to convince the so-called climate skeptics to adopt pro-environmental individual behaviors (Bain et al., 2012), and support public climate change policies. The literature reviewed will ultimately form the basis for the frames that will be tested in this thesis.

The policy-design that I explore support for in the framing experiment is:
reducing agricultural subsidies to red meat production, and repurposing the funds to reduce the VAT (i.e., price) on vegetables, fruits and berries. This specific policy design is the same one as policy design 2b in table 1, and will allow the use of some interesting frames that do not apply to the policy; carbon tax on red meat.

3.5.1 **What is framing?**

Framing has become the most common conceptual tool applied to climate change communication (Gunster 2017). The initial focus in this field was on framing the science of climate change. However, there has become increasing awareness of how framing may be used in order to increase support for unpopular but necessary climate policies (Scannell & Gifford, 2013; Wolsko et al., 2016)[27]. Different frames can be used to communicate why an issue might be a problem, who or what might be responsible, what should be done about it, or motivations to deal with the issue (Nisbet 2009). In other words, when designing climate policies, they need not necessarily be communicated to the public as such (i.e., climate issues) if there are varying concerns or co-benefits involved with these policies that people to

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[27] Other framing studies have found that acceptance of taxes might even depend among others on the verbal description of the tax change (Tvinnereim and Steinshamn 2016). For example, Acceptance for a 'fee' is found to be greater than acceptance for a 'tax' (Kallbekken, Kroll, and Cherry 2009). The effect of peer influence on consumer choice (other people are doing it) has also shown to be highly motivational for reducing people`s power consumption (Stokens 2015 : 99).

a greater degree reconcile with (Tangeland et al., 2020: 134); Kundzewicz et al., 2020).

3.5.2 Alternative ways of framing the need for climate policies

3.5.2.1 Health frames

Previous research suggests that focusing on health aspects rather than climate aspects, could be a motivator among individuals who are less concerned about environmental threats and thus implementation of climate-policies. Casting climate change as a public health issue has been shown to elicit positive emotional responses (Maibach et al. 2010; Myers et al. 2012; Semenza et al. 2011). These studies have generally focused on the future health consequences of climate change. Furthermore, a study by Cordts et al. (2014) found that highlighting negative health effects of meat consumption was more effective than focusing on GHG emissions, and Petrovic et al. (2014) have found that a public health frame included in the study elicited stronger support for policies among conservatives than a climate frame.

In light of the findings above, an interesting question is to which extent a health frame could increase support for the subsidy-reduction policy design that was chosen for examination in this thesis.

3.5.2.2 Economic frames

Another approach for framing climate policies which has gained some attention in the climate-communication literature is, *economic frames*. The idea is that linking the effects of policies with the economy could be less controversial across value orientations and perhaps engage a wider public. Perhaps even among people on the right side of the ideological spectrum who think predominantly in terms of market opportunities (Nisbet 2009: 2). Compared to arguments based on complex climate science, the economic dimension of public policies is relatively easy to understand and it is often perceived as compelling by citizens (Mildenberger & Leiserowitz, 2017).

When adopting an economic frame however, there are various different types of information

this could contain. Utilizing economic frames could involve focusing on turning the economic development frame in favor of action- recasting climate change as an opportunity to grow the economy (Nisbet 2009 : 2). However, it could also involve linking the negative environmental effects of for instance, subsidies, with their distortive economic effects (Vitalis 2007 : 37). A third suggestion of what a economic frame could entail, is information about implications from implementing or not implementing the policy, on people`s personal finances. Findings from (Bayulgen & Benegal 2019; 1) suggests that framing climate policies (such as renewable energy policies) in terms of their personal economic costs, such as high electricity bills, has more impact on attitudes compared to positive frames emphasizing job creation and economic development.

In the Norwegian context, there are several arguments present as for how a change in subsidy support could have implications for both the national economy, but also for taxpayers personal economy.

First, Ivar Gaasland have found that the Norwegian agricultural goals, e.g., common good of- maintaining a high proportion of nationally produced food, food security, cultural landscape and environment- can be met at least as well as today with only 40 percent of agricultural support, and that it would be more economical (a more efficient use of money to achieve the same objectives) to shift support from volume production to area-extensive production (Brunstad & Gaasland 2006: 46; Gaasland 2010 : 4).

Second, current agricultural subsidies which lowers prices per unit of meat and hence, encourages consumption, is also negatively impacting the wider economy through additional health-care costs, e.g., money which could have been spent on other public goods. According to the report «Social benefits from following the Norwegian Directorate of Health's dietary advice» (Helsedirektoratet 2016), the socio-economic benefit of the entire population following dietary guidelines on consumption of red meat is estimated at approximately 30 billion each year. At the same time, the societal costs associated with consequences due to too low intake of fruit and vegetables is estimated at around NOK 60 billion annually (Helsedirektoratet 2016 : 32). It follows from this that if those who eat too much meat replace

parts of their red-meat consumption with vegetables and fruits, then cost savings from both these calculations could occur.[28]

Third, everyone has to pay approximately NOK 11 000 for the food subsidies through their taxes annually (Brunstad & Gaasland 2006 : 40/41). Since the level of subsidies allocated to a specific production affects the prices of those food-products in the store (Gaasland 2020: 2), their current use (in which 47% is utilized for red meat production) comes at the expense of reduced prices on other food products. Given that a person holds a preference for consuming other food-products (such as for instance, vegetables and fruits) at a lower price, then a measure that proposes to shift parts of the tax-funded subsidies away from red meat production and towards those food-products, could be private-economically profitable.

3.5.2.3 **Fairness frames**

Previous research on support for climate policies furthermore shows that public support depends on perceptions of whether or not the policy is *fair* (Huber et al., 2020: 658). Perceived fairness relates to the general evaluation of a policy as fair or unfair among different societal groups (Tyler 2000), and higher perceptions of fairness could lead to increased levels of support (Ittner et al. 2003; Maestre-Andrès et al., 2019; Severson & Coleman 2015).

While the carbon tax on red meat commonly is perceived as unfair, the policy-design chosen for examination in this framing-experiment (i.e., subsidy reduction coupled with repurposing for other purposes) would likely be seen as more fair by many people. The reason for that is that, currently, everyone regardless of their preferences for meat are forced to pay a part of the bill for others private consumption (Gaasland 2020 : v).

Approximately half (47%) of the total annual agricultural subsidies in Norway go exclusively to meat production, while only 6 percent goes to the production of vegetables and plants which may be eaten directly (Gaasland 2020 : vii). At the same time, some taxpayers are striving to reduce their own red meat consumption for various reasons in line with recommendations for health, climate or animal welfare (in favor of a diet based on fish, vegetables and fruits (a diet which is more expensive to maintain in the first place). While

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[28]

the meat eater manages to *shift* large parts of the cost of their meat consumption onto the community, for the consumer, this will constitute "additional costs" on top of the cost for their *actual consumption* annually.

H6: The frames: a) health, b) national economy, c)personal economy and d) fairness, increase support for the policy-design examined.

3.5.3 **Conditioned framing effects**

Although there is a large literature which suggest that public opinion is vulnerable to various types of framing and cue effects (Bechtel et al., 2015), the research on framing simultaneously shows that the effect of frames on policy support can be conditioned on the political orientation of individuals (Aasen & Vatn, 2018). Bechtel et al., (2015) for instance, found that voters in their study responded to frames and cues, by increasing support for the position that was in line with their pre-existing partisan attachment. These results seem to be in line with an emerging literature identifying the limits to framing effects in competitive information environments (Slothuus, 2010; Aaroe, 2012; Nicholson, 2011a; Jerit and Barabas, 2012). The explanation for this effect is that, when it comes to contested and highly debated policy issues, voters have previously been exposed to political campaigns and formed a strong view on the policy issue (Bechtel et al., 2015: 2).

H7: Framing effects are conditioned on left-right placement.

4 Method and research design

A quantitative research design has been applied in this thesis. Quantitative research is often theory-driven, and allows for examination of width by registering comparable and structured information in a large sample. A quantitative research strategy is based on the assumption that social phenomena show stability, so that measurement and quantitative description are meaningful (Ringdal, 2013). While there are broadly three different types of research design within quantitative methods (exploratory, causal/explanatory, and descriptive) (Gripsrud, Olsson & Silkoset, 2010), two causal/explanatory designs have been utilized in this thesis.

The choice of utilizing a causal design in this thesis has followed naturally from the purpose of the analysis: to determine to which extent i. certain policies, ii. certain policy designs (entailing earmarking/repurposing) and iii. certain frames increase respondents willingness to support some effective meat reduction policies in Norway. Utilizing survey experiments, the researcher is able to provide different groups with different *treatments*, and the effects of the treatments may be compared on a subsequent question (such as for instance, policy support) (Mutz, 2011). By randomly distributing people to different groups in large samples, it ensures that they on average do not differ on other x-variables than the treatment (Ringdal 2001, 78) and that the outcome of support likely is due to the intervention (Ringdal, 2013).

Two survey experiments were designed and fielded through Norstat. The first survey experiment was designed to examine whether the two policies (i.e., carbon tax on red meat, and reduction in subsidies to red meat production) would attain equally high resistance, and what effects earmarking (or repurposing) means for *three* different re-distributional purposes (which could alleviate economic inequality) might attain on support, for reasons previously explained within the theoretical chapter of this thesis. The second survey experiment was designed to examine what effect *four* different kinds of framing might have on public support for one chosen meat reduction policy-design. In sum, support for eight different policy designs were explored in survey 1, while support for one chosen meat reduction policy-design given four different frames, were explored in survey 2, and compared against support in a control group. See table 1 and 2 below for an overview of this.

Table: 1
Overview of the treatments in survey 1

Policy design (1a) Carbon tax policy on red meat	1
Policy design (1b) Tax policy with revenues earmarked for reducing the VAT on fruits, vegetables and berries	2
Policy design (1c) Tax policy with revenues earmarked for reducing the VAT on fish and seafoods	3
Policy design (1d) Tax policy with revenues earmarked for reducing the VAT on vegetarian meat-replacers	4
Policy design (2a) Subsidy-reduction policy (reducing subsidies to red meat production)	5
Policy design (2b) Subsidy-reduction policy with funds repurposed for reducing the VAT on fruits, vegetables and berries	6
Policy design (2c) Subsidy-reduction policy with funds repurposed for reducing the VAT on fish and seafoods	7
Policy design (2d) Subsidy-reduction policy with funds repurposed for reducing the VAT on vegetarian meat-replacers	8

Table: 2
Overview of the treatments in survey 2

Control group	1
Treatment (1) (Health frame)	2
Treatment (2) (National economy frame)	3
Treatment (3) (Personal economy frame)	4
Treatment (4) (Fairness frame)	5

The studies also gathered information about other characteristics of the respondents that could possibly affect public support for the policies examined. These included: political views, gender, age, education, and geography. These other questions in the data set were presented before and independently of the experimental design.

The questions in both survey experiments all concerned support for the two different policies of focus in this thesis, which both concern internalizing the externality- i.e., greenhouse gas

emissions of high meat consumption- through raising the price on red meat in the store. The proposed levels of taxation as well as levels of subsidy reduction included in the survey experiments, were based on the calculations made by Mittenzwei (2015). As posited in the previous sections, Mittenzwei`s (2015) simulations impact on climate emissions does not vary significantly depending on the measure chosen (of those that were simulated), as most of the emission reductions are already achieved when the support level is reduced by NOK 420 (NOU 2015:15: 137; Mittenzwei 2015: 28). It therefore makes sense to examine support for those simulations that achieve the least burden for both consumers and the industry. As such, I chose to examine support for the simulations Til410, and AvgLik, which implies a reduction in budgetary aid to red meat production of 10 percent or a tax rate of NOK 7,18 per kg red meat (2015 NOK). The rates applies to cattle/veal and sheep/lamb (Mittenzwei 2015 : 15). Both simulations indicate a price increase on red meat corresponding to NOK410 per tonne of CO_2 (Mittenzwei 2015 : 11,12), and the measures would have approximately the same effect on the consumption and production of red meat (Mittenzwei 2015 : 18). These two policies would both entail a price increase of NOK 7,18 (2015 NOK) per kg of red meat, and both could, in isolation, be able to reduce the greenhouse gas emissions from the sector in an order of about 5 per cent in the period, compared to the reference trajectory (Mittenzwei 2015 : 27).

The survey experiments were sent out to a representative sample of the Norwegian population in between the ages of 15 and 60+. Since it is generally desirable that the sample in any study exceeds 100 respondents (Jacobsen, 2005) in order to be able to draw conclusions, this goal was complied with in both studies and none of the samples included consisted of any less than 200 respondents. In both studies, people were randomly divided into different groups in order to establish unbiased causal inferences (Mutz, 2011, p. 3). Further details about the design of the surveys will be described in section 4.2.1 and 4.2.2.

The data from the surveys constituted the data sets that later would be included in OLS regressions and other statistical output created in the programme R.

4.1 Choice of model

The models in this paper are based on multivariat *OLS (ordinary least squares) regression analyses*. OLS is a common technique for estimating coefficients of linear regression equations which describe the relationship between one or more independent quantitative variables and the dependent variable. When estimating an OLS model optimally, the summed square of the observations' deviation from the model is minimized (Ringdal 2013: 393). The model estimates the parameters in a regression model by minimizing the sum of squared residuals. In other words, it draws a line through the data points that minimizes the sum of the squared differences between the observed values, and the corresponding predicted/fitted values (Ringdal 2013: 397).

In the models, *Y* is the dependent variable that we would like to examine change in, while *X* is the independent explanatory variable(s) which we may manipulate in order to examine relative effects from. The residual term is given by *u*, which captures variation in Y that is not explained through the independent variables included in the model (Ringdal 2013: 394; Gujarati & Porter 2009). In the OLS regression models utilized in this thesis, the regression equation consist of the following variables:

Y *support* = β_0 *constant* + β_1 *treatment effects* +.β_2 *age* + β_3 *gender* + β_4 *left-right* + β_5 *education* + β_6 *city* + **u** *error term*

4.1.2 **Specification of variables**

Since the goal in this analysis is to explore how different independent variables affect public support for two different meat reduction policies (i.e., the carbon tax policy, and subsidy-reduction policy), *policy support* constitutes the dependent variable in the models that have been created.

The models furthermore included *two kinds* of independent variables:
In the OLS models created to test the effect specific forms of earmarking/repurposing have on support levels for the two policies, the data from the treatments in survey 1 - i.e., *policy designs,* were used as independent variables. In the models created to test the effect of different frames on the level of support for the two policies, the data from the treatments in survey 2 - i.e., *frames,* were used as independent variables.

All the OLS models created, additionally contained a second kind of independent variables: i.e., the following five control variables: *political views/affiliation, gender, age, urban residence,* and *education*. Previous studies on support for the carbon tax policy show that these demographic characteristics imply higher acceptance rate when it comes to introducing effective measures in order to reduce meat consumption. It is on the basis of these findings that I have also included these variables in the analysis. We may expect young, highly educated and urban people to be the most positive towards policy-implementation. Income however should not have a significantly positive effect on support for the measures (Grimsrud et al.2019). We may also expect reported placement towards the left-side of the political scale, to increase levels of agreement (Helliesen, unpublished: 19).

4.1.3 Treatment of missing values

Before elaborating about the data collection and the operationalization of variables, I will explain how the "dont know" answers will be treated in the analysis. On all the questions regarding support for policy implementation, the possibility of answering "neither disagree nor agree" was present. This answer may be viewed similarly as "dont know" answers in other studies. The fact that the respondent does not want to take a position on the question, might indicate that the individual does not feel they have adequate knowledge to take a position to the proposal, and it would be wrong to code these answers in either category of support or opposition. As such, I will choose to handle these answers in the analysis by filtering them out, and rather just look at the average of those who have decided on the questions (Lindheim et al. 2014).

4.1.4 T-test

The t-test can be used to compare two means (averages) in order to reliably determine whether they are statistically different from each other (or the control) or not, how significant the difference is, and whether those differences could`ve occurred by chance (Ringdal, 2013). In this thesis, a paired t-test is utilized in order to determine whether there is a significant difference in support for the two measures examined in this thesis (i.e., support for a tax on meat, versus support for the subsidy reduction measure).

4.1.5 **Interaction effects**

Previous studies have found that on salient and highly contentious political issues, voters may respond to frames by increasing support for the position that is in line with their pre-existing partisan attachment (Bechtel et al., 2015; Aasen & Vatn, 2018). (Helliesen, unpublished) found this effect when investigating framing effects on the policy; tax on red meat. It seems reasonable to expect that framing effects for the subsidy reduction policy examined in this paper, similarly could depend on political orientation/left-right placement on the political scale. Thus, I will also check for interaction effects. If such an interaction effect does take place, this will be consistent with the emerging literature identifying the limits to framing effects in competitive information environments (Slothuus and de Vreese 2010; Aaroe, 2012; Nicholson, 2011a; Jerit and Barabas, 2012).

4.2 Data collection

A total of seven hypotheses were formulated in tandem with the design of the theoretical section. Two survey experiments were designed and fielded in Norstat`s citizen panel in order to collect primary data that could confirm or disprove the hypotheses. The process of how this data was obtained is described below.

4.2.1 **Survey 1**

The first survey was conducted the preceding week of (6.04.2022). 1015 respondents were surveyed, and randomly assigned (Jacobsen, 2005) into one of four groups of the following sizes: 255 respondents in group 1, 259 respondents in group 2, 252 respondents in group 3 and and 249 respondents were placed in group 4. All respondents had to answer two questions each. The two questions received by respondents were comparable in the sense that they either asked about support for two identical policies, or support for these two policies given identical policy designs. Although this study did not include a control group, the values on the two different groups of variables were used to control against each other. Holding the effectiveness of the policy constant, this allows for examining the effect of the perceived benefits of the two policies, as well as the effect of the perceived benefits of the different policy designs.

Table 3 below presents the exact wording of the questions delivered to the pool of respondents who answered survey number one (See the Appendix in order to view the questions in Norwegian, which was the language in which the respondents were presented with the questions). Before answering the two questions that the respondents were randomly assigned, they were all given an identically worded primer that included information about i. the link between global greenhouse gas emissions and red meat production[29], and ii. the fact that the policy under examination would yield positive effects on behavior change, and thus consequently emission reductions.

The respondents were then asked to rate their levels of agreement with the statements on a seven-point scale from strongly disagree to strongly agree.

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[29] Rosenzweig et al (2020) estimated that the food system contributes to 20%-40% of the greenhouse gas emissions from all economic activities, and Crippa et al (2021) have quantified the contribution to one-third of total anthropogenic emissions.

Table: 3

Survey questions included in survey 1

Primer given to all groups 25-30% of global greenhouse gas emissions can be attributed to the food system, and red meat production accounts for 40% of these. Both measures: 1) a tax on red meat, and 2) a reduction in subsidies for the production of red meat - will be able to contribute to reducing the consumption of red meat, and thus national CO_2 emissions. To what extent do you agree or disagree with the following statements: *To combat climate change, the Norwegian government should:*

Questions for group 1:	**Questions for group 2:**
A. *Introduce a tax on red meat* (cattle/veal and sheep/lamb) corresponding to a price increase for red meat of NOK 7.18 per kilo. **B.** *Reduce tax-financed subsidies for the production of red meat* (cattle/veal and sheep/lamb) by 10 percent, which will increase the price of red meat by NOK 7.18 per kilo, but at the same time give the population a tax relief corresponding to the cut in subsidies.	**A**. *Introduce a tax on red meat* (cattle/veal and sheep/lamb) corresponding to a price increase for red meat of NOK 7.18 per kilo, and earmark tax revenues to reduce VAT on Norwegian-produced vegetables, fruit and berries, as it will make these foods cheaper. **B.** *Reduce tax-financed subsidies for the production of red meat* (cattle/veal and sheep/lamb) by 10 percent, which will increase the price of red meat by NOK 7.18 per kilo, and rather use the funds to reduce VAT on Norwegian-produced vegetables, fruits and berries, as it will make these foods cheaper.

Questions for group 3:	**Questions for group 4:**
A. *Introduce a tax on red meat* (cattle, veal and sheep / lamb) corresponding to a price increase for red meat of NOK 7.18 per kilo, and earmark tax revenues to reduce VAT on Norwegian-produced fish and seafood, as it will make these foods cheaper. **B.** *Reduce tax-financed subsidies for the production of red meat* (cattle/veal and sheep/lamb) by 10 percent, which will increase the price of red meat by NOK 7.18 per kilo, and rather use the funds to reduce VAT on Norwegian-produced fish and seafood, as it will make these foods cheaper.	**A.** *Introduce a tax on red meat* (cattle/veal and sheep/lamb) corresponding to a price increase for red meat of NOK 7.18 per kilo, and earmark tax revenues to reduce VAT on Norwegian-produced vegetarian and meat substitute products, as it will make these foods cheaper. **B.** *Reduce tax-financed subsidies for the production of red meat* (cattle/veal and sheep/lamb) by 10 percent, which will increase the price of red meat by NOK 7.18 per kilo, and rather use the funds to reduce VAT on Norwegian-produced vegetarian and meat substitute products, as it will make these foods cheaper.

> **Answer options for both questions, given to all groups:**
> 1. Strongly agree, 2. Agree, 3. Somewhat agree, 4. Neither agree nor disagree, 5. Slightly disagree,
> 6. Disagree, 7. Strongly disagree.

The different policy-designs examined were based on previous research. While findings from Grimsrud et al., (2019) suggests that policy design 1b) and potentially 2b) listed in table 1 above (concerning fruits and vegetables) (Grimsrud et al., 2019: 260) may lead to higher support for the two policies in question, results from (Varela et al., 2021) suggests that policy design 1c) and potentially 2c) concerning fish and seafoods) might be most effective, as respondents in their study reported that they view fish and seafood as natural substitutes to meat in questions of reduction and substitution, and that this is something the population thinks tastes very good and desire to consume more of (Varela et al., 2021 : 5). The policy designs 1d) and 2d) in table 1 above (concerning meat-replacers) was included for examination as it has been discussed in previous academic reports that price adjustments on these foods could be a moderately effective measure in order to steer behavior change (Miljødirektoratet et al., 2020: 68).

4.2.1.2 **Operationalization of variables**

The treatment effects from the different policy designs were included as independent variables in the analysis. The other socio-economic variables included in the model were: age (years) coded as **age**, female (woman = 1, man = 0) coded as **gen**, education (higher education = 1, otherwise = 0) coded as **edu**, city (if the respondent is living in the biggest cities of Oslo, Bergen, Trondheim or Stavanger = 1, otherwise = 0) coded as **city**. The variable 'politics' was equal to 1 if the respondent had voted conservative/right-wing (KRF, Venstre, Høyre and FRP) at the previous parliamentary election, and otherwise 0, coded as **left_right**.

The dependent variable support was measured from 1 (strongly disagree) to 7 (strongly agree), and in the model it was coded as a dummy where support levels of 1 2 and 3 received the value 0), while support levels of 5 6 and 7 on the scale received the value 1).

4.2.1.3 **Information components included in survey 1**

Table 4 below provides an overview of the different information-components included in the "primer" (i.e., the text which was given to all respondents in the survey before they received the different policy treatments), and the sources they were based on.

Table: 4

Information components included in survey 1

"25-30% of global greenhouse gas emissions can be attributed to the food system"	The AFOLU sector is responsible for just under a quarter of anthropogenic GHG emissions which mainly derives from deforestation and agricultural emissions from livestock, soil and nutrient management (Smith et al.,2014: 816). This seems to be a quite consistent finding in the literature (Rosenzweig et al., 2021; and Crippa et al., 2021).
"red meat production accounts for 40% of these."	A report from IPCC states that about 70% of global GHG emissions from the food system is associated with *enteric fermentation in digestive systems* (which as explained in previous chapters, mainly originates from *ruminant livestock/red meat*) and associated *land use/land-use change activities* (i.e., LULUC) (IPCC: 823). Out of these, 32-40% origins from enteric fermentation (Smith et al., 2014: 823), whilst 32% constitute emissions from LULUC, i.e., emissions associated with agricultural production (Crippa et al., 2021: 199). For the sake of simplicity, I chose to use the figure of enteric fermentation (40%) as the reference point of meat's total share of emissions from the food system when designing the surveys (Smith et al., 2014: 823). However, presenting exclusively the number of emissions from enteric fermentation downplays the fact that emissions from for instance land use change related to animal production are much higher than those related to food production for direct human consumption. It would be more precise to provide respondents information about a figure which also accounted for emissions *associated* with animal agriculture. For instance, (Xu et al., 2021) investigated GHG emissions from different food productions (i.e., plant based foods, animal based foods, and other utilizations) (Xu et al., 2021: 727), as the sum of emissions from LUC, farmland, livestock, and "beyond the farm gate emissions" (Xu et al.,2021: 729) and found that food-system emissions tied to animal-based food production constituted 57% of the total food system GHG emissions (Xu et al., 2021: 726).
"Both measures: 1) a tax on red meat, and 2) a reduction in subsidies for the production of red meat - will be able to contribute to reducing	In an overall perspective, these adaptations seem to give approximately the same end result with regard to the reduction of greenhouse gas emissions through lower production and consumption of red meat (Mittenzwei et al., 2015: 31, 32; NOU 2015:15: 109/110).

the consumption of red meat, and thus national CO2 emissions."	

4.2.2 **Survey 2**

The second survey was conducted the preceding week of (24.08.2022). 1058 respondents participated in the survey, who were all randomized into one of five groups of the following sizes: 197 respondents in group 1, 199 respondents in group 2, 213 in group 3, 198 in group 4, and 251 in group 5. All respondents had to answer one question each, concerning support for the exact same policy (policy design 2b in table 1); *The government should reduce agricultural subsidies to red meat production with 10 percent, and spend these funds to reduce the VAT (i.e., price) on vegetables, fruit and berries.*

The majority of the respondents (i.e., those who were placed into four of the five groups) received a treatment before answering the question concerning support for the measure. The respondents who were placed in one of the five groups (ie., the control group) received no treatment. Table 5 below presents the treatments and the exact wording of the questions. After being presented with the question, all respondents were asked to what extent they agree or disagree with the statement, on a 7-point scale from strongly disagree to strongly agree.

Table: 5

Survey questions included in survey 2

Group 1 (control group)	
To what extent do you agree or disagree with the following statement: The Norwegian government should reduce tax-funded subsidies for the production of red meat by 10 percent, which will increase the price of red meat by approximately 7.18 NOK per kilo, and rather use the funds to reduce the VAT on Norwegian-produced vegetables, fruit and berries, as it will make these foods cheaper.	
Framing for group 2 (health) National dietary guidelines encourage increasing consumption of fruit and vegetables, which will be health-promoting, and to limit consumption of red meat due to the link between high intake and a number of lifestyle	**Framing for group 4 (personal economy)** An average household pays 11,000 NOK in agricultural subsidies through the tax bill annually. 47% of this goes to the production of red meat, while only 6% goes to plants that can be consumed directly. High subsidies affect the

diseases (such as obesity, cancer, heart attacks and diabetes). *To what extent do you agree or disagree with the following statement:* The Norwegian government should reduce tax-funded subsidies for the production of red meat by 10 percent, which will increase the price of red meat by approximately 7.18 NOK per kilo, and rather use the funds to reduce the VAT on Norwegian-produced vegetables, fruit and berries, as it will make these foods cheaper.	prices on goods in the store. *To what extent do you agree or disagree with the following statement:* The Norwegian government should reduce tax-funded subsidies for the production of red meat by 10 percent, which will increase the price of red meat by approximately 7.18 NOK per kilo, and rather use the funds to reduce the VAT on Norwegian-produced vegetables, fruit and berries, as it will make these foods cheaper.
Framing for group 3 (national economy) National health expenditure related to the consequences of insufficient fruit and vegetable consumption is calculated by the Norwegian Directorate of Health to cost the state 60 billion NOK annually. At the same time, health expenses linked to excessive consumption of red meat are estimated to cost society 30 billion NOK annually. *To what extent do you agree or disagree with the following statement:* The Norwegian government should reduce tax-funded subsidies for the production of red meat by 10 percent, which will increase the price of red meat by approximately 7.18 NOK per kilo, and rather use the funds to reduce the VAT on Norwegian-produced vegetables, fruit and berries, as it will make these foods cheaper.	**Framing for group 5 (fairness)** An average household pays 11 000 NOK in agricultural subsidies through the tax bill annually, of which about half (47%) goes to the production of red meat. Everyone has to contribute to subsidize the production of red meat, also those who try to reduce their consumption due to consideration for health, climate or animal welfare. *To what extent do you agree or disagree with the following statement:* The Norwegian government should reduce tax-funded subsidies for the production of red meat by 10 percent, which will increase the price of red meat by approximately 7.18 NOK per kilo, and rather use the funds to reduce the VAT on Norwegian-produced vegetables, fruit and berries, as it will make these foods cheaper.

Answer options given to all groups:
1. Strongly agree, 2. Agree, 3. Somewhat agree, 4. Neither agree nor disagree, 5. Slightly disagree, 6. Disagree, 7. Strongly disagree.

The effect of these four frames compared to the effect of the control, will in the analysis also be compared to the effect of a climate frame which was detected in the first survey (i.e., policy design 2b in table 1). In the first survey, this group of respondents were asked about support for the exact same policy, however, the framing emphasized the meat's climate impact, before respondents reported on their given level of support for the measure.

Regarding the choices behind the various frames utilized in the survey experiment, the following applies: The health frame was inspired by (Helliesen, unpublished) previous study on the carbon tax issue. The economic frames was developed based on encouragement from previous studies (Vitalis 2007 : 1; Bayulgen & Benegal 2019; 1) which concluded that linking negative environmental effects with the distortive economic effects and personal costs, may have promising impacts on attitudes particularly among conservatives, who more often oppose initiatives for effective climate policy. The fairness frame was inspired by real events, as I have observed that this is a frame often used by environmental organizations in Norway such as The Future In Our Hands.

4.2.2.1 Operationalization of variables in the models

In the models created based on the data from survey number 2, the treatment effects of the different frames were included as independent variables. The models also included other socio-economic variables, which were coded as follows: age (years) coded as **age**, female (woman = 1, man = 0) coded as **gen**, education (higher education = 1, otherwise = 0) coded as **edu**, city (if the respondent is living in the biggest cities of Oslo, Bergen, Trondheim or Stavanger = 1, otherwise = 0) coded as **city**. The variable 'politics' was equal to 1 if the respondent had voted conservative/right-wing (KRF, Venstre, Høyre and FRP) at the previous parliamentary election, and otherwise 0, coded as **left_right**.

The dependent variable support was measured as in the first survey from 1 (strongly disagree) to 7 (strongly agree), and in the model it was coded as a dummy where support levels of 5 6 and 7 on the scale received the value 1, while support levels of 1 2 and 3 received the value 0).

4.2.2.2 Information components included in survey 2

In table 6 below, I will refer to the sources of the different information-components included in the treatments, i.e., "framings" which were given to respondents in survey number two.

Table: 6

Information components included in survey 2

	The Norwegian dietary advice includes among others recommendations to

	- eat lean meat, choose low-fat milk - choose low-fat dairy products - limit the intake of hardened fat, and to - eat more vegetables (Helsedirektoratet 2011:10; Helsedirektoratet 2021; 58).
"National dietary guidelines encourage increasing consumption of fruit and vegetables, which will be health-promoting"	The dietary advice is intended to help prevent chronic diet-related diseases in the population. The World Health Organization (WHO) and the health authorities in most countries estimate that a large part of the incidence of chronic diseases such as cardiovascular disease, cancer, type 2 diabetes and obesity can be prevented with changes in diet, physical activity and smoking habits (Helsedirektoratet 2011:7).
"and to limit consumption of red meat due to the link between high intake and a number of lifestyle diseases (such as obesity, cancer, heart attacks and diabetes."	In the report (Helsedirektoratet 2011) on pages 22,23,38, there are listed diverse disease-contexts which is associated with high meat consumption. On pages 110/111 in the report, they furthermore list various organizations in which the dietary advice about reduced red-meat consumption is in accordance with. The organizations listed are among others: The world health organization, the American Heart association, the American Dietic Association, NHS, the World Cancer Research Fund.
"An average household pays 11,000 NOK in agricultural subsidies through the tax bill annually."	In an article published in Økonomisk Forum in 2006, the authors Brunstad & Gaasland argue that if we consider an average household, the household will pay about NOK 20,000 for today's agriculture, and that about NOK 11 000 of these expenses will take form as taxation above the tax bill, whilst about NOK 9 000 will take place over the household budget in the form of shielding support (Brunstad & Gaasland 2006 : 40/41).
"47% of this goes to the production of red meat, while only 6% goes to plants that can be consumed directly."	94% of total agricultural subsidies go to animal products, while only 6% goes to plants that can be consumed directly. The resource use per produced unit is significant higher for animal products than for vegetable products. This applies *especially* to meat from ruminants who alone receive almost half of the total subsidies (47%) (Gaasland 2020 : vii).

"High subsidies affect the prices on goods in the store."	A common feature of the various subsidies is that taxpayers cover part of the costs production and turnover, which in turn helps to write down the price of agricultural goods in the markets (Gaasland 2020: 2). If the subsidies are removed, a dynamic will be set in motion in the markets in the direction of lower prices, production and consumption. The consumer naturally has to pay a higher price, while the farmer has to put up with a lower one, and it is precisely these price mechanisms that create the dynamics in the direction of lower production and consumption (Gaasland 2020: 5).
"National health expenditure related to the consequences of insufficient fruit and vegetable consumption is calculated by the Norwegian Directorate of Health to cost the state 60 billion NOK annually."	The societal costs related to loss of health due to too low intake of fruit and vegetables is estimated at around NOK 60 billion. There is in other words potentially significant social benefits to be *gained* both through taxes and subsidies that are targeted at achieving better public health (Helsedirektoratet 2016: 32/33).
"At the same time, health expenses linked to excessive consumption of red meat are estimated to cost society 30 billion NOK annually".	The societal cost (loss of health, health service costs and loss of production) related to Norwegians' consumption of red meat and processed meat is in the order of NOK 30 billion. This large external cost comes in addition to costs related to global environmental problems, and thus reinforces the rationale for correcting production/consumption of red meat with taxes (Helsedirektoratet 2016: 32).
"An average household pays 11 000 NOK in agricultural subsidies through the tax bill annually," *"of which about half (47%) goes to the production of red meat. "* *"Everyone has to contribute to subsidize the production of red meat, also those who try to reduce their consumption due to consideration for health, climate or animal welfare."*	This information was provided above. -"- When a consumer buys lamb, he only pays ¼ of the production costs while taxpayers cover ¾ of the bill. Regardless of the individual taxpayer's preferences for the item in question, he is forced to pay part of the bill for other people's private consumption (Gaasland 2020: v).

5 Discussion of the results

In the following section, I will be presenting the results hypothesis by hypothesis, and discuss them against the expectations that were expressed earlier in the theory part of this thesis.

Since it took two surveys to investigate the hypotheses developed earlier in the theoretical section, I will divide the findings part in two. The first part will deal with the findings related to the hypotheses associated with survey no. 1, and the second part will deal with the findings related to the hypotheses associated with survey no. 2. While the first survey examined respondents support for two measures (i.e., the tax policy versus the subsidy reduction policy) with and without three different combinations of earmarking/repurposing, the second survey examined the effects of various framings on support for one selected policy. In both these parts I will present the results from the data utilizing regression-tables, coefficient plots and descriptive statistics.

5.1 Results from survey 1

Before discussing the results in line with the hypotheses which were examined through survey number one, the distributions of the dependent variable will be presented.

Table 7 below provides the distributions of the dependent variable, divided in treatment groups. Overall, most people disagree with both the tax policy, as well as the subsidy reduction policy. This appears by looking at the columns for the various policies, as the combined numbers of reported agreement who fall into one of the three categories of either "strongly disagree, disagree, or somewhat disagree" exceeds the amount of people who voted in favor of the policies through either reporting that they either strongly agree, agree, or somewhat agree that the policy should be implemented. It seems that also most of the other policy proposals examined are unable to elicit support in the population.

However, when it comes to policy proposal 2b (in table 1), most people seem to fall into one of the three categories of agree when asked about whether they think the measure should be implemented. Given that subsidies are repurposed for reducing the VAT on fruits and vegetables, only 39% of the respondents either strongly disagree, disagree or somewhat disagree, while 43% of the answers fell into one of the three categories of "agree", and 20% had no opinion. Depending on how one chooses to interpret the "have no opinion" answers, it appears that this specific policy proposal does have support in the population.

Table: 7
Distributions of the dependent variable divided by policy designs- survey 1

Policy design 1a Tax on red meat	
Strongly agree (7)	7%
Agree (6)	3%
Somewhat agree (5)	14%
Have no opinion (4)	19%
Somewhat disagree (3)	10%
Disagree (2)	17%

Policy design 2a Subsidy reduction policy	
Strongly agree (7)	8%
Agree (6)	8%
Somewhat agree (5)	7%
Have no opinion (4)	31%
Somewhat disagree (3)	8%

Strongly disagree (1)	30%
Mean:	4,9

Disagree (2)	16%
Strongly disagree (1)	22%
Mean:	4,6

Policy design 1b **Tax on red meat - earmarked for reducing the VAT on fruit and vegetables**	
Strongly agree (7)	10%
Agree (6)	14%
Somewhat agree (5)	16%
Have no opinion (4)	18%
Somewhat disagree (3)	10%
Disagree (2)	11%
Strongly disagree (1)	22%
Mean:	4,2

Policy design 2b **Subsidy reduction policy - repurposed for reducing the VAT on fruit and vegetables**	
Strongly agree (7)	10%
Agree (6)	12%
Somewhat agree (5)	21%
Have no opinion (4)	20%
Somewhat disagree (3)	11%
Disagree (2)	9%
Strongly disagree (1)	19%
Mean:	4,1

Policy design 1c **Tax on red meat - earmarked for reducing the VAT on fish and seafoods**	
Strongly agree (7)	10%
Agree (6)	8%
Somewhat agree (5)	13%
Have no opinion (4)	20%
Somewhat disagree (3)	10%
Disagree (2)	16%
Strongly disagree (1)	24%
Mean:	4,6

Policy design 2c **Subsidy reduction policy - repurposed for reducing the VAT on fish and seafoods**	
Strongly agree (7)	9%
Agree (6)	10%
Somewhat agree (5)	13%
Have no opinion (4)	22%
Somewhat disagree (3)	11%
Disagree (2)	15%
Strongly disagree (1)	20%

Mean:	4,4

Policy design 1d Tax on red meat - earmarked for reducing the VAT on vegetarian meat substitute products	
Strongly agree (7)	10%
Agree (6)	5%
Somewhat agree (5)	14%
Have no opinion (4)	16%
Somewhat disagree (3)	11%
Disagree (2)	14%
Strongly disagree (1)	30%
Mean:	4,7

Policy design 2d Subsidy reduction policy - repurposed for reducing the VAT on vegetarian meat substitute products	
Strongly agree (7)	11%
Agree (6)	6%
Somewhat agree (5)	11%
Have no opinion (4)	20%
Somewhat disagree (3)	11%
Disagree (2)	11%
Strongly disagree (1)	30%
Mean:	4,7

Before proceeding with the analysis- it should be clarified what the various independent variables included in the regression tables (table 9, and table 10) have been named. Table 8 below provides an overview of this.

Table: 8

Variables included in table 9:

gender	gen
age	age
education	edu
ideology/ political affiliation	left_right
city	city
treatment: Earmarking for reducing the VAT on	TreatmentE armarkFruit

Variables included in table 10:

gender	gen
age	age
education	edu
ideology/ political affiliation	left_right
city	city
treatment: Repurposing for reducing the VAT on	treatmentEa rmarkFruit

fruits, vegetables and berries	
treatment: Earmarking for reducing the VAT on fish and seafoods	treatmentEarmarkFish
treatment: Earmarking for reducing the VAT on vegetarian meat-replacers	treatmentEarmarkVeggie

fruits, vegetables and berries	
treatment: Repurposing for reducing the VAT on fish and seafoods	TreatmentEarmarkFish
treatment: Repurposing for reducing the VAT on vegetarian meat-replacers	treatmentEarmarkVeggie

H1: The policy (reduction in subsidies to red meat production) attains higher general public support than the policy (carbon tax on red meat).

In section 3.1, and 3.1.2, I showed some theory on the cost of policies, and the results from different studies which indicates that policies which entail fewer costs for people likely will attain higher public support. Based on this theory, I expected to find a difference in support for the two measures; carbon tax on red meat (i.e., policy 1a in table 1), and subsidy-reduction to red meat production (i.e., policy 2a in table 1). The subsidy-reduction policy examined (without repurposing), emphasized the hypothesized assumption that the taxpayer would *receive* money on their tax bill if the subsidy reduction measure was implemented (see group 1, on table 3), while the tax measure without earmarking entailed having to *pay more* for the meat, without any form of compensation.

The findings from this data shows, however, that support for the carbon tax and subsidy reduction policies (i.e., policy design 1a and policy design 2a in table 1) is approximately the same. This can be seen above in table 7 (see columns for policy designs 1a and 2a), which show that the levels of support for the tax and subsidy-reduction policies was 24% and 23% respectively, without the opportunities of earmarking/reporposing. This finding is at odds with the theory on "the cost of the policy", stating that the cost of the measure is particularly important for policy support.

At the same time the data shows that, when support for all the policy designs examined is taken into account (i.e., policy designs 1a-1d versus 2a-2d in table 1), it appears that people in

general oppose implementation of the tax policy more compared to the subsidy-reduction policy. This was confirmed by the t-test (comparing the means of the two groups). The mean of the group who reported support for the tax policy proposals is lower (3,37), while the mean of the group who reported support for the subsidy policy proposals is higher (3,57). That makes a 0,2 difference in support for the two policies (on the 1-7 support scale) with a 95% confidence level, meaning that H2 is confirmed. For all the details related to the paired t-test, see the appendix. This is an interesting finding, which is in line with previous findings on support for subsidy-reduction measures compared to tax-policies (Dietz & Shwom 2007).

H2: Reported placement on the left side of the political spectrum increases support for both policies (i.e., the tax and the subsidy-reduction policy), compared to reported placement on the right side of the political spectrum.

As presented in section 3.2, theory suggests that political orientation are important determinants of policy support for pro-environmental policies (Harring, Jagers, & Matti, 2017). According to this theory, right-wing people can be expected to be more sceptical towards pro-environmental initiatives than people on the left (Harring & Sohlberg, 2017; Severson & Coleman, 2015).

In order to test the second hypothesis, some multiple-regression models will be utilized to compare the coefficients (left_right) indicating the effects of the variable ideology (i.e., left-right placement on the political spectrum) on both policies. The coefficients show the relative effect from one independent variable on the dependent variable- while holding other predictors in the model constant. Because of the way the ideology-variable is coded, the minus sign in front of the coefficients means that given reported identification with KRF, Venstre, Høyre or FRP = 1, support will likely be reduced by a specified amount.

On the regression tables below (table 9, and table 10) it appears that the coefficient for the ideology-variable "left_right" is statistically significant on both policies (p<0.01). This indicates that on both policies, reported political positioning on the right decreases the likelihood of agreement with the policies compared to placement on the left, thus confirming hypothesis number two.

The coefficient for the ideology variable (left_right) on the carbon tax policy (visible in table 9 below) shows the combined effect that the variable ideology has on support for the different tax- proposals examined. The coefficient for the ideology variable (left_right) on the subsidy-reduction policy (visible in table 10 below) similarly shows the effect that the variable ideology has on support for the different subsidy-reduction proposals examined. It appears that holding right-wing political views decrease support levels for the tax-policy proposals with -1.04 points on the 7-point agreement scale which the support was measured by. Similarly, having voted right-wing in the last election decreases support levels for the subsidy-reduction policy with -0.9 points on the 7-point agreement scale.

The regressions simultaneously shows that, all the effects from the other variables included in the models move in the expected direction in line with findings from previous studies which shows that the characteristics of being younger, female, or having higher education predicts support. The positively significant coefficients shows that higher education increases support by (0,43 and 0,29) points on the 1-7 agreement scale for the tax and subsidy-reduction policies, respectively. It also shows that being female likely increases support on the same scale by (0,37 and 0,33) for the tax and subsidy-reduction policy, that increasing age by 1 year decrease support by 0,01 points for both policies, and that living in a city increases support for the subsidy-reduction policy only, by (0,34) points on the 7-point agreement scale.

| **Table 9:** | **Table 10:** |

OLS regression model 1

Treatment effects on the carbon tax policy

	Dependent variable:
	tax_agreement
treatmentEarmark Fish	0.327[*]
	(0.182)
treatmentEarmark Fruit	0.555[***]
	(0.186)
treatmentEarmark Veggie	0.078
	(0.184)
age	-0.019[***]
	(0.004)
gen	0.372[***]
	(0.133)
left_right	-1.041[***]
	(0.133)
edu	0.437[***]
	(0.135)
city	0.214
	(0.146)
Constant	4.153[***]
	(0.283)
Observations	812
R^2	0.162
Adjusted R^2	0.154
Residual Std. Error	1.847 (df = 803)
F Statistic	19.412[***] (df = 8; 803)
Note:	[*]p<0.1; [**]p<0.05; [***]p<0.01

OLS regression model 2

Treatment effects on the subsidy-reduction policy

	Dependent variable:
	subsidy_agree
treatmentEarmark Fish	0.145
	(0.182)
treatmentEarmark Fruit	0.403[**]
	(0.185)
treatmentEarmark Veggie	-0.178
	(0.184)
age	-0.012[***]
	(0.004)
gen	0.331[**]
	(0.133)
left_right	-0.905[***]
	(0.133)
edu	0.292[**]
	(0.134)
city	0.349[**]
	(0.146)
Constant	4.130[***]
	(0.282)
Observations	812
R^2	0.126
Adjusted R^2	0.117
Residual Std. Error	1.841 (df = 803)
F Statistic	14.416[***] (df = 8; 803)
Note:	[*]p<0.1; [**]p<0.05; [***]p<0.01

H3: People on the right side of the political spectrum are more likely to support the subsidy-reduction policy, compared to the tax policy.

In section 3.3, some attempts to explain the polarization (i.e., left right divide) in support for climate policies were presented. In line with some of this theory (Harring & Sohlberg 2017 : 281; Dunlap et al. 2001 : 34) I expected that the tax policy would conflict more with right-wing individual`s underlying ideological perceptions regarding connections between politics and economics, and that they consequently would oppose the tax-policy more than

than the subsidy-reduction policy.

The regressions (i.e., table 9, and table 10 above) shows that the greatest predictor of agreement with both policies clearly is left-right placement. They also show the effect of the ideology-variable is greater for the tax policy compared to the subsidy-reduction policy (-1.04 versus -0.9, respectively). In other words, having voted right-wing in the last general election predicts lower support for the tax policy than for the subsidy-reduction policy- which people who voted right-wing in the last general election were less likely to oppose.

The varying effects of ideology on support for the two policies appears in the two effect-plots below (figure 1, and figure 2). Figure 1 illustrates support for the tax policy, while figure 2 illustrates support for the subsidy-reduction policy. Both graphs show that the support declines when an individual`s ideology changes from left-wing to right-wing (i.e., from 0-1). Figure 1 shows that the line cuts midway (between the numbers 2.5 and 3.0) along the Y axis, while figure 2 shows that the line cuts the down right corner (at approximately 3.0) along the Y axis. This indicates that among people on the right side of the political spectrum, support levels for the subsidy-reduction policy is consistently higher than for the tax-policy.

Figure 1: Effect of ideology on support for the carbon-tax policy
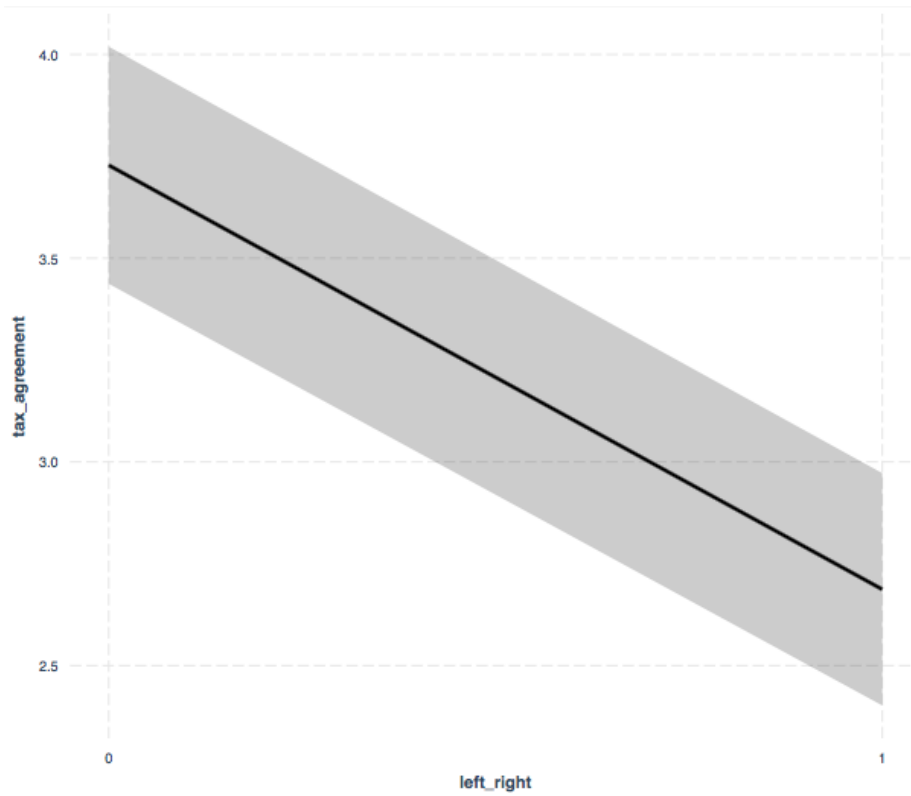
Figure 2: Effect of ideology on support for the subsidy-reduction policy
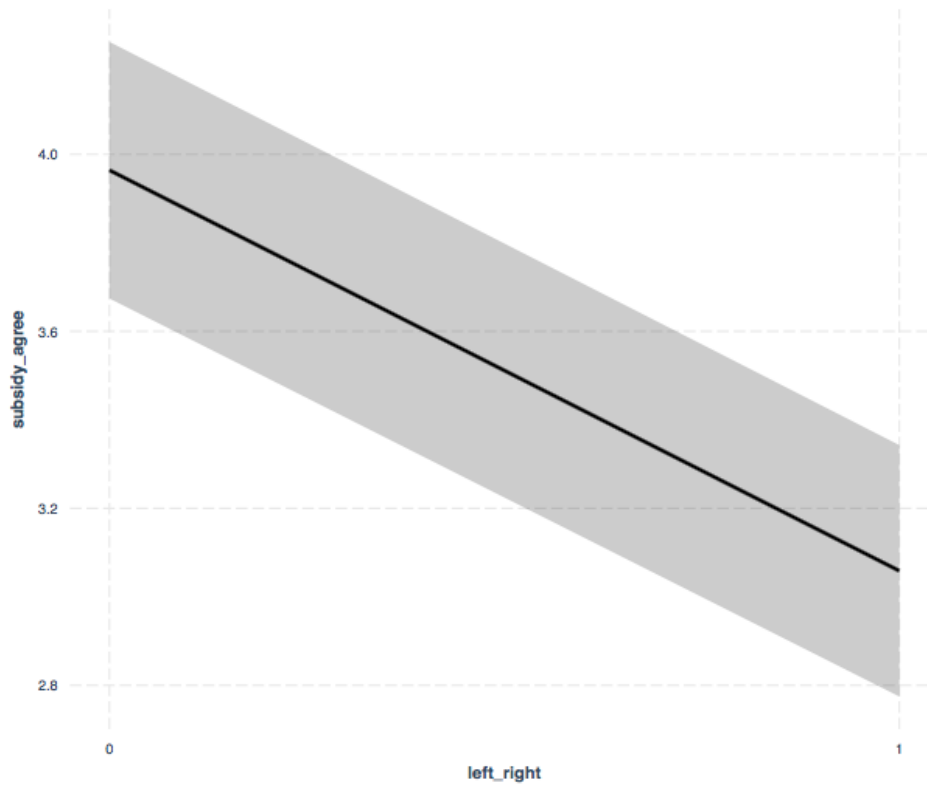
H4: The policies that include earmarking/repurposing in this study will attain higher support than the policies without earmarking.

H5: The possibility of earmarking tax revenues/repurposing subsidies to reduce the VAT on fruit, vegetables and berries, increase support the most relative to other policy designs.

Based on the strong and consistent results that earmarking the revenues from environmental taxes for environmental purposes substantially increases their popularity (see section 3.4.1), I expected that earmarking/repurposing for the chosen purposes examined in this study- would increase support for both policies examined. I also expected the possibility of earmarking/repurposing to reduce VAT on fruit, vegetables and berries to increase support the most of the policy designs examined, since this is what previous studies have found to be most desirable by respondents (Grimsrud et al., 2019: 260).

As visible in table 9 and table 10 above, the only earmarking/re-purposing that significantly affected policy support of those examined, was for vegetables, fruit and berries.
Table 9 shows that earmarking the revenues from the carbon tax for this purpose, increases support for the policy with 0.55 points on the 1-7 support scale. Table 10 shows that repurposing reduced subsidies vegetables, fruit and berries, increases support for the policy 0.40 points on the 1-7 support scale.

In order to visualize the results from the regressions, coefficient plots will be utilized. In the coefficient plots below (figure 3 and figure 4), the blue lines around the estimates for each variable illustrate the confidence interval of 95 per cent. As visible, only the treatment Fruit in figure 3 and 4 do not intersect the reference line at 0, which indicates that this is the only policy designs (i.e., forms of earmarking/repurposing) which significantly increases support for the two policies examined. In other words, H4 may be rejected, while H5 is confirmed: earmarking the tax revenues, or repurposing them (for the purposes examined in this thesis) does not necessarily lead to increased support for the policies. However, people consistently prefer that the means (i.e., tax revenues, or reduced subsidies) are utilized for the purpose of lowering the prices on fruits vegetables and berries, and this policy alternative raises support the most of all the possibilities of earmarking/repurposing examined in this study.

Figure 3:

Treatment effects on the carbon tax policy
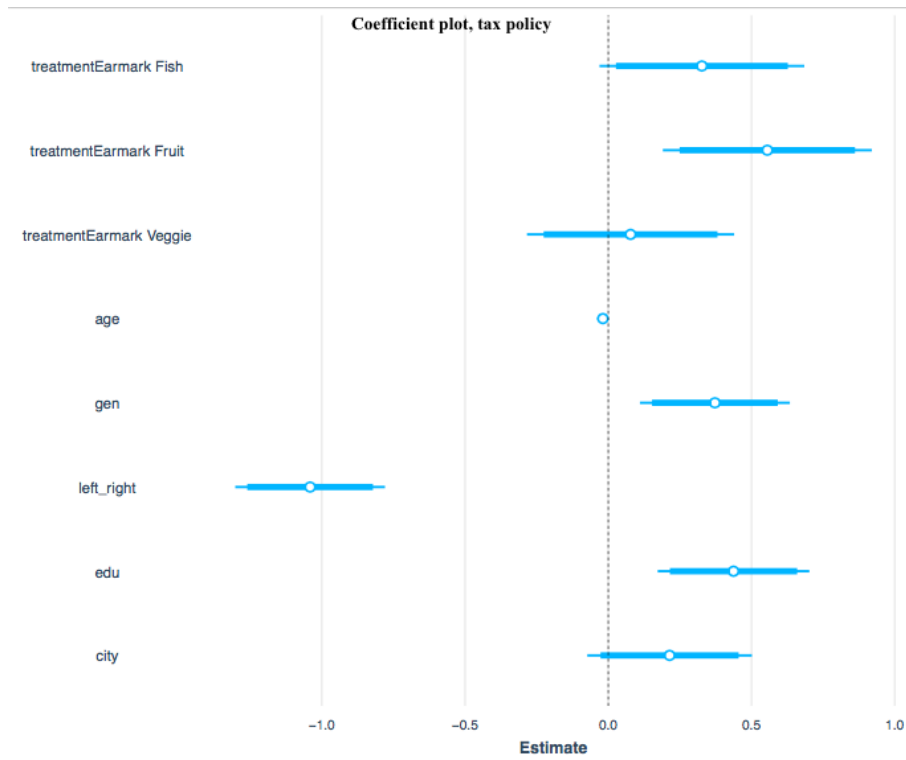
Figure 4:

Treatment effects on the subsidy reduction policy
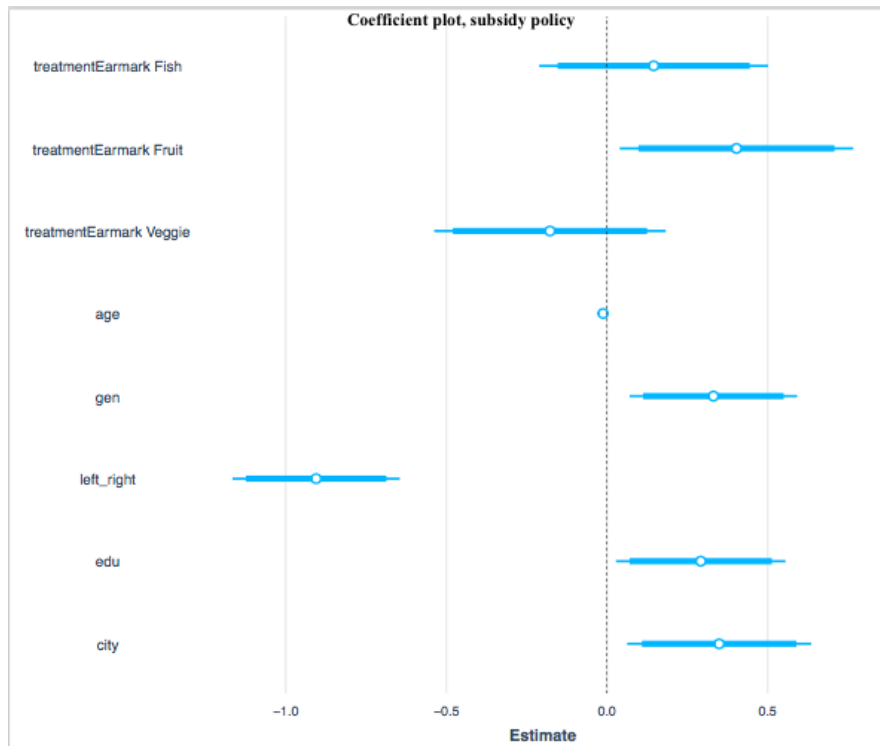
5.2 Results from survey two

Before discussing the results of the hypotheses associated with survey number two, the distributions of the dependent variables will be presented.

The survey experiment examined support for the chosen measure (i.e., policy design 2b in table 1): *The norwegian government should reduce tax-funded subsidies to production of red meat with approximately 10%, which would increase the price of red meat with approximately 7,18 NOK, and rather use the means to reduce the VAT on domestically produced vegetables, fruits and berries, as it will make these goods cheaper).*

Table 11:

Distributions of the dependent variable divided by treatment groups (frames)- survey 2

Control	
Strongly agree (7)	14%
Agree (6)	9%
Somewhat agree (5)	14%
Have no opinion (4)	23%
Somewhat disagree (3)	9%
Disagree (2)	10%
Strongly disagree (1)	21%
Mean:	3,8

Treatment: 1 Health frame	Treatment: 2 National economy frame

Strongly agree (7)	14%
Agree (6)	9%
Somewhat agree (5)	15%
Have no opinion (4)	27%
Somewhat disagree (3)	10%
Disagree (2)	10%
Strongly disagree (1)	17%
Mean:	3,9

Strongly agree (7)	14%
Agree (6)	9%
Somewhat agree (5)	18%
Have no opinion (4)	24%
Somewhat disagree (3)	10%
Disagree (2)	15%
Strongly disagree (1)	11%
Mean:	4,1

Treatment: 3 Personal economy frame	
Strongly agree (7)	15%
Agree (6)	13%
Somewhat agree (5)	18%
Have no opinion (4)	26%
Somewhat disagree (3)	8%
Disagree (2)	8%
Strongly disagree (1)	13%
Mean:	4,3

Treatment: 4 Fairness frame	
Strongly agree (7)	14%
Agree (6)	10%
Somewhat agree (5)	16%
Have no opinion (4)	24%
Somewhat disagree (3)	7%
Disagree (2)	9%
Strongly disagree (1)	19%
Mean:	4,0

Table 11 above provides the distributions of the dependent variable in the control group as well as in the treatments. It appears from these figures that the measure without any form of framing (see the control), results in more people opposing implementation compared to those who state support. The majority of the answers in the control (i.e., 40%) fell into one of the three-categories of either strongly disagree, disagree, or somewhat disagree, 23% had no opinion, while **37%** of the respondents reported that they either strongly agree, agree, or

somewhat agree with implementation of the measure.

Given most of the framings included in the study however, it seems that the measure actually did manage to elicit support (i.e., a majority of people who prefer implementation compared to those in opposition). Support in the other treatment groups appears to be consistently higher, and overall more people express support for the policy-design examined, compared to those who express opposition. The distribution of support on the dependent variable in the various groups, was as following:

After being presented with information regarding **health**-consequences related to red-meat consumption, **38%** of the respondents reported that they either strongly agree, agree, or somewhat agree that the policy should be implemented. 37% fell into one of the three categories of disagree, and 27% had no opinion.

Support for the measure was even greater among the group which received information about consequences of current high red-meat consumption for the **national economy**. In this group, **41%** of the respondents reported that they either strongly agree, agree, or somewhat agree that the policy should be implemented, while 36% fell into one of the three categories of disagree, and 24% had no opinion.

Support for the initiative was highest among the group that received information about implications that the proposed measure could have on one`s **personal economy.** In this group, **46%** of people reported that they either strongly agree, agree or somewhat agree with the measure, only 29% voted in one of the three categories of disagree, while 26% had no opinion.

When it comes to support for the measure given the final framing, i.e., where information was given emphasizing how the measure can be considered as more **fair** for many, approximately **40%** expressed that they either strongly agree, agree or somewhat agree, while 24% had no opinion and 35% fell into one of the three categories of disagree.

Earlier in the thesis, I also stated that I intended to assess the support from the control, in light of the support for the same policy detected in survey number one (i.e., policy 2b in table 1).

The reason for this is that, in survey number one, one group of the four groups of respondents were asked about support for this exact same policy (policy alternative 2b). However, in conjunction with receiving this question, the respondents were given information about the **climate effects** of red-meat consumption. Given this climate-related information, **43%** of the respondents expressed that they either strongly agree, agree, or somewhat agree that the measure should be implemented.

Since new models were made in order to analyse the data from survey number 2, Table 12 below contains an overview of what the independent variables included in the models (i.e., table 13) were named.

Table 12:
Variables included in table 13

gender	gen
age	age
education	edu
ideology/ political affiliation	left_right
city	city
Treatment: Health frame	treatmentHealth
Treatment: National economy frame	treatmentNationalEconomy
Treatment: Personal economy frame	treatmentPersonalEconomy
Treatment: Fairness frame	treatmentSocialJustice

H6: The frames: a) health, b) national economy, c)personal economy and d) fairness, increase support for the policy-design examined.

As shown in section 3.5.1, alternative forms of policy-framing have been found able to increase support for unpopular but necessary climate policies (Scannell & Gifford, 2013; Wolsko et al., 2016). In line with this theory, I expected that the frames designed for this study would lead to increased support for the policy examined.

On the regression table below (table 13) it appears that the variable ideology (i.e., left_right) negatively affects support, and even predicts support more than than all the treatments examined. Having voted right-wing in the last general election, decreased support for the policy proposal examined in the groups by -0.79 points on the support scale from 1-7. Other variables which have a positive and significant effect on support are education, which will increase support for the policy proposal with (0,29) points on the 1-7 support scale, gender-i.e., being female increases support by (0,52) points on the 1-7 support scale, and living in a city (0,37).

Table 13: OLS regression model 3
Treatment effects of frames

	Dependent variable:
	support
treatmentHealth	0.021
	(0.213)
treatmentNational Economy	0.109
	(0.217)
treatmentPersonal Economy	0.520**
	(0.216)
treatmentSocial Justice	0.167
	(0.204)
age	-0.009**
	(0.004)
gen	0.523***
	(0.136)
left_right	-0.796***
	(0.135)
edu	0.294**
	(0.139)
city	0.379**
	(0.148)
Constant	4.188***
	(0.294)
Observations	844
R^2	0.104
Adjusted R^2	0.094
Residual Std. Error	1.921 (df = 834)
F Statistic	10.701*** (df = 9; 834)
Note:	*p<0.1; **p<0.05; ***p<0.01

When it comes to the effect of the treatments, the only treatment with a statistically significant coefficient, was the personal economy frame, which seems to increase support for the proposed policy with (0,52) points on the 7-point support scale. This effect is quite large compared to the effect from the health frame (0,02), the national economy frame (0,10) and the fairness frame (0,16).

The coefficient-plot below (figure 5) visualizes the effects of the coefficients. Most of the point estimates are all placed on the right-side of the plot, indicating a positive effect on support, besides the ideology variable visibly placed on the left-side on the plot, which has a negative effect. The personal economy variable is the only variable on the plot who`se blue line (confidence interval) do not touch the middle line (reference line at 0), indicating that this is the only treatment which does have a significant effect on support for the policy examined. This means that H6 is confirmed; framing does increase support for the policy examined, however, the effect of framing completely depends on which frame that is used.

Figure: 5

Treatment effects of the frames
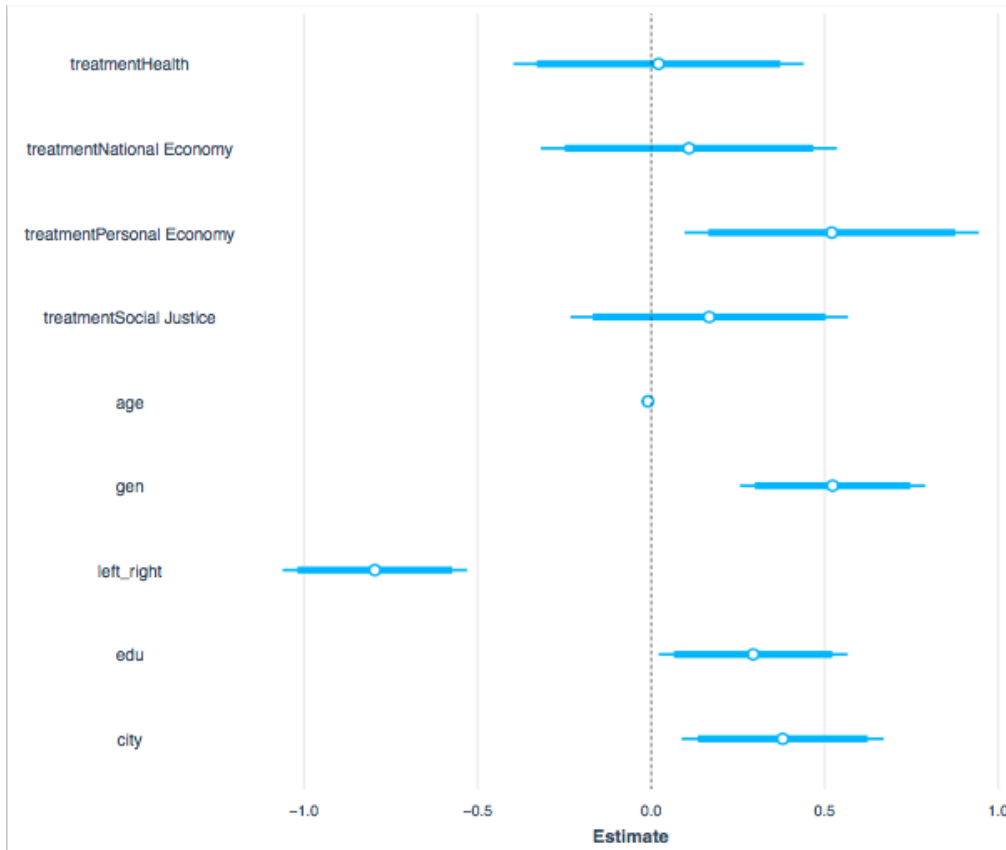
H7: Framing effects are conditioned on left-right placement.

In section 3.5.3 I presented some literature which has shown that framing effects on policy support can be conditioned on the political orientation of individuals (Aasen & Vatn, 2018).

The regression table below (table 14) were made in order to examine possible interaction effects between the framing treatments, and the ideology variable (left-right placement). In the regression table, we can see that none of the coefficients of the bottom four variables are statistically significant, i.e., affects left or right wing people any differently. On the coefficient plot (figure 6), we can see the lack of interaction effects visually. All of the variables confidence intervals (the bottom four at the interaction plot) intersect the reference line at 0, which indicates that the effects are not significant. In other words, the treatment

effects are stable across people on both the left and the right side of the political spectrum, and H7 is rejected.

Table 14: Interaction effects

	Dependent variable:
	support
treatmentHealth	-0.061
	(0.314)
treatmentNational Economy	-0.135
	(0.322)
treatmentPersonal Economy	0.505
	(0.310)
treatmentSocial Justice	0.080
	(0.302)
left_right	-0.955***
	(0.307)
age	-0.009**
	(0.004)
gen	0.521***
	(0.136)
edu	0.293**
	(0.139)
city	0.377**
	(0.149)
treatmentHealth:left_right	0.160
	(0.428)
treatmentNational Economy:left_right	0.443
	(0.437)
treatmentPersonal Economy:left_right	0.030
	(0.432)
treatmentSocial Justice:left_right	0.167
	(0.411)
Constant	4.267***
	(0.325)
Observations	844
R^2	0.105
Adjusted R^2	0.091
Residual Std. Error	1.924 (df = 830)
F Statistic	7.482*** (df = 13; 830)
Note:	*p<0.1; **p<0.05; ***p<0.01

Figure: 6

Interaction effects
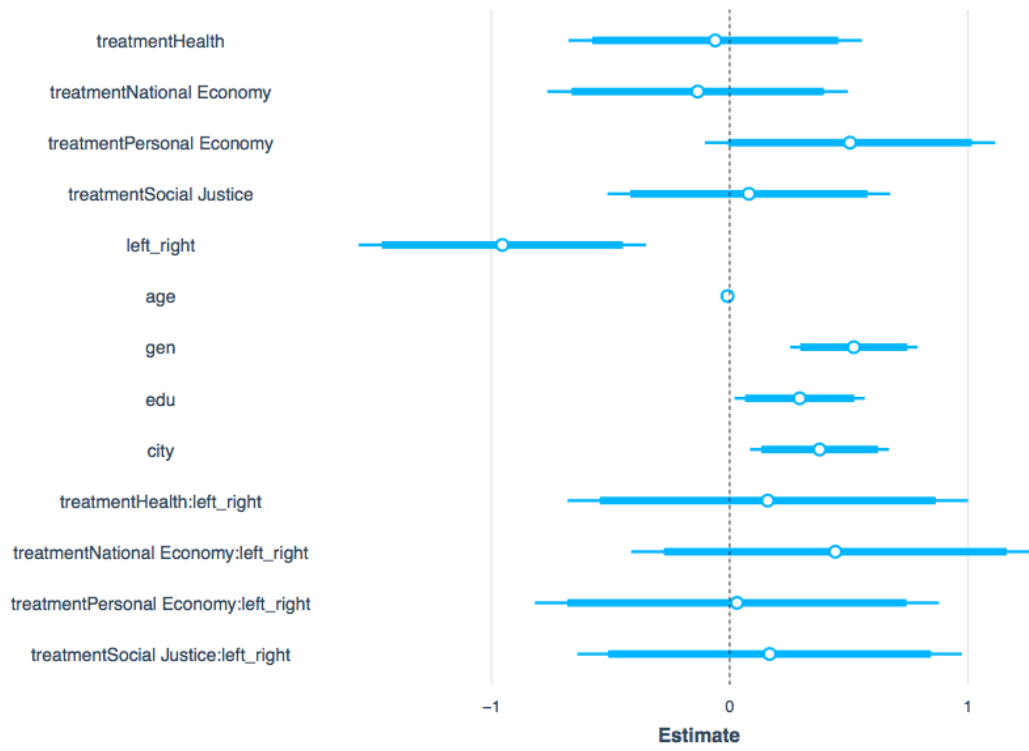
6 Conclusion

As stated in chapter 1, the objective of this paper was threefold. The most interesting findings related to the three different objectives, will be summarized below.

The first objective was to examine and compare public support for the two measures; carbon-tax on red meat, and reducing subsidies to red meat production, in order to determine whether the subsidy-reduction policy would attain equally high resistance. The findings show that, the various policy proposals examined that involved reducing subsidies to red meat production did attain higher support, than the various policy proposals that involved implementing a carbon tax on red meat. However, contrary to what I expected, support for the two policies can not be explained due to the lower costs of the subsidy-reduction policy. Support for the two policies (1a and 2a in table 1) was approximately the same. Besides from the subsidy-reduction policy proposal without repurposing (i.e., 2a in table 1), the other policy-designs for the subsidy-reduction policy (that entailed repurposing) would involve the same costs for people, as the proposed tax measures (with earmarking). The amount of reduced subsidies in these other policy scenarios (i.e., 2b-2d in table 1) would (not benefit taxpayers directly on the tax slip, but) simply be redirected to other purposes. This would, similarly as in the tax scenarios, entail that the meat would become more expensive, while other foods relatively cheaper.

What the explanation for the difference in support for the two measures could be then, is difficult to say. It may be that the different policy-designs involving the subsidy-reduction policy seem less coercive or deterrent for most people, compared to the different policy-designs for the tax proposals. Previous research (Kallbekken & Sælen 2011) shows that even different kinds of labeling (of the same policy) may affect support. The word "fee" increases support relatively to the equivalent instrument called "tax". It may also be that it simply makes more sense for people to remove the root cause of the problem (i.e., reduce the subsidies) rather than having to impose further taxation as a medicine for over-consumption. This finding is in any case in line with findings from other studies such as (Dietz & Shwom 2007) who have found that subsidy-reduction policies in the area of fossil fuels, attained higher support among people than tax measures. Implications from this finding are that, if organizations and parties aim is to have the population on board with policy-proposals for reducing emissions from red-meat consumption, then they should focus on subsidy reduction

measures that imply repurposing, rather than the carbon-tax policy.

The results furthermore revealed that: people on the right side of the political spectrum were less likely to oppose the subsidy-reduction policies, compared to the tax policies. This finding confirms arguments that have been put forward by others as possible explanations for the political divide in support for climate policies, i.e., that it at least partly can be explained by the fact that right-wing individuals, who tend to dislike political involvement as well as taxes (Drews and van den Bergh, 2015; Kallbekken and Aasen, 2010), hold ideological beliefs that are less compatible with pro-environmental policies (Harring & Sohlberg 2017 : 281). This finding indicates that there are other ways than information tactics that may be able to engage climate skeptics to accept climate measures, and policy makers should therefore think creatively around which instruments that can be utilized. If equally effective alternative measures that do not involve taxation are available, these could attain higher support among right-wing individuals who commonly oppose implementation of effective climate policies (and especially those which involve taxation).

The second objective of this thesis was to explore whether, and to which degree some previously un-researched forms of earmarking (or repurposing)[30], could increase support for the two policies; tax on red meat, and reduced subsidies to red meat production.
The results from the data collected showed that- the effects of earmarking (or repurposing) highly depend on the purpose for which the earmark/or repurposing, is directed. Although all the earmarks examined would entail alleviating increased inequality, which studies show people are particularly concerned about (Grimsrud et al 2019.,: 258), only one of the purposes examined (i.e., earmarking/repurposing for reducing the VAT on fruits, vegetables and berries) increased support for the two policies. This earmark (i.e., reducing the VAT on fruits, vegetables and berries) was chosen for examination based on answers from previous surveys, which indicated that this earmark is what most people would prefer (Grimsrud et al., 2019 : 260).

The implications of this finding is twofold. First, it implies that- before examining the effects of different forms of earmarking on policy support, it is wise to examine what respondents

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[30] Repurposing of subsidies essentially entails reforming them (FAO 2021: xvi). In this thesis repurposing will involve reforming agricultural subsidies which are unsustainable towards purposes that are the opposite.

themselves express that they would prefer, rather than just examining the effect of earmarking for anticipated desired purposes. Second, earmarking can potentially have a very high effect on support. The policy alternative that received the highest support of all those examined in the study, i.e., repurposing reduced subsidies from red meat production- for reducing the VAT on vegetables, fruits and berries, was able to increase support from the initial policy with 20% (see table 7 for the distributions on support, policy design 2a versus policy design 2b). This specific policy design even appears to have support in the population , as more people expressed that they support implementation of the measure (43%) compared to those who opposed implementation (39%) (see policy design 2b in table 7).

The third objective of this study was to examine different framing effects on one chosen meat-reduction policy policy-design, in order to determine whether there is an effective way to frame meat-reduction policies for everyone, independent of values and ideology. Variation in the way motivations for implementing the policy is communicated, influence individual preferences and move citizens opinions of policy support in the desired direction (Chong and Druckman, 2007a; Chong and Druckman, 2007b). The policy design chosen for the framing experiment was policy design 2b in table 1 presented earlier in this thesis, i.e.,: repurposing reduced subsidies from red meat production- for reducing the VAT on vegetables, fruits and berries.

The four frames included in the study entailed information emphasizing different motivators for why the policy should be implemented: a health frame, a national economy frame, a personal economy frame and a fairness frame. Many voters likely already held rather strong pre-existing beliefs about the issue, since they were not susceptible to react to most of the frames introduced. Out of the frames examined, only the `personal economy` frame increased support for the measure, and the treatment was able to attain much greater effects relatively to the other frames included in the study. The personal-economy frame contained information implicitly emphasizing that the measure could benefit respondents personal economy positively. The elements emphasized in the measure contained information on; i. taxpayer`s annual contribution to agricultural subsidies, ii. what percentage of these subsidies goes exclusively to red meat production versus plant based production, and iii. that *high subsidies affect the prices of goods in the store*. A yes-vote to the proposed measure after this frame has been introduced, can be interpreted as follows: The respondent wants to eat more fruit and

vegetables, and thinks the prices of these items are higher than they should be. The measure is interpreted as privately economically profitable, thus, she would prefer a relative price-change between the food groups.

The personal-economy frame managed to increase support for the policy-design examined by no less than 9 % relative to the control (see table 11, control versus treatment effect 3). Ultimately, the frame elicited 46% support for the policy-design examined, while only 29% opposed implementation (see table 11, treatment effect 3). These results support previous research, which shows that economic actors are selfish and act based on the maximization of their own utility (Sælen og Kallbakken 2011). This finding has some implications for how meat-reduction policies should be communicated to the public: instead of providing reasonable explanations about the consequences of red meat consumption on health, the national economy, climate, or even consequences the current level of subsidy-support to red meat have on others (i.e., that it is unfair), it can be a highly promising approach to rather focus on positive economic opportunities the measure can have for people specifically.

In conclusion, this study shows that it would be highly beneficial to think creatively when designing climate measures (and meat reduction measures, in particular) in order to attain support in the population. The three strategies examined in this thesis all proved able to increase support for meat reduction policies that involved pricing emissions from red meat consumption and production. Previous studies on support for the carbon tax policy have found that the measure had high resistance in the population. Roughly 24% of the respondents in previous studies have been found to be supportive of the carbon-tax on red meat (Bruvoll & Lindhjem 2021), a number that is actually identical to the level of support for the carbon tax policy found in this study (i.e., only 24% of respondents accepted the measure, see table 7, policy design 1a. However, the alternative measure; reducing subsidies to red meat production and repurposing subsidies for reducing the VAT on fruit, vegetables and berries, was able to attain 42% support, and after utilizing the most effective frame examined in this study (i.e., the personal economy frame) 46% reported that they either strongly agree, agree or somewhat agree that the measure should be implemented.

7 Appendix

Questions for respondents in Survey 1	
Gruppe 1. 25-30 % av de globale klimagassutslippene kan tilskrives matsystemet, og produksjon av rødt kjøtt står for 40 % av disse. Begge tiltakene: 1) avgift på rødt kjøtt, og 2) reduksjon av subsidier til produksjon av rødt kjøtt- vil kunne bidra til å redusere forbruket av rødt kjøtt, og dermed nasjonale CO_2-utslipp. I hvilken grad er du enig eller uenig i følgende utsagn: *For å bekjempe klimaendringene så bør den norske regjeringen:* A. *Innføre en avgift på rødt kjøtt* (storfe, kalv og sau/lam) tilsvarende en prisøkning for rødt kjøtt på 7,18 kroner per kilo. B. *Redusere skattefinansierte subsidier til produksjon av rødt kjøtt* (storfe, kalv og sau/lam) med 10 prosent, som vil øke prisen for rødt kjøtt med 7,18 kroner per kilo, men samtidig gi befolkningen skattelette tilsvarende kuttet i subsidier. Svaralternativer for begge spørsmålene: 1. Helt enig, 2. enig, 3. litt enig, 4. Verken enig eller uenig, 5. Litt uenig, 6. Uenig, 7. Helt uenig.	Gruppe 2. 25-30 % av de globale klimagassutslippene kan tilskrives matsystemet, og produksjon av rødt kjøtt står for 40 % av disse. Begge tiltakene: 1) avgift på rødt kjøtt, og 2) reduksjon av subsidier til produksjon av rødt kjøtt- vil kunne bidra til å redusere forbruket av rødt kjøtt, og dermed nasjonale CO_2-utslipp. I hvilken grad er du enig eller uenig i følgende utsagn: *For å bekjempe klimaendringene så bør den norske regjeringen:* A. Innføre en *avgift på rødt kjøtt* (storfe, kalv og sau/lam) tilsvarende en prisøkning for rødt kjøtt på 7,18 kroner per kilo, og øremerke skatteinntektene til å redusere momsen på norskproduserte grønnsaker, frukt og bær, da det vil gjøre disse matvarene billigere. B. *Redusere skattefinansierte subsidier til produksjon av rødt kjøtt* (storfe, kalv og sau/lam) med 10 prosent, som vil øke prisen for rødt kjøtt med 7,18 kroner per kilo, og heller bruke midlene til å redusere momsen på norskproduserte grønnsaker, frukt og bær, da det vil gjøre disse matvarene billigere. Svaralternativer for begge spørsmålene: 1. Helt enig, 2. enig, 3. litt enig, 4. Verken enig eller uenig, 5. Litt uenig, 6. Uenig, 7. Helt uenig.
Gruppe 3. 25-30 % av de globale klimagassutslippene kan tilskrives matsystemet, og produksjon av rødt kjøtt står for 40 % av disse. Begge tiltakene: 1) avgift på rødt kjøtt, og 2) reduksjon av subsidier til produksjon av rødt kjøtt- vil kunne bidra til å redusere forbruket av rødt kjøtt, og dermed nasjonale CO_2-utslipp. I hvilken grad er du enig eller uenig i følgende utsagn: *For å bekjempe klimaendringene så bør den norske regjeringen:* A. *Innføre en avgift på rødt kjøtt* (storfe, kalv og	Gruppe 4. 25-30 % av de globale klimagassutslippene kan tilskrives matsystemet, og produksjon av rødt kjøtt står for 40 % av disse. Begge tiltakene: 1) avgift på rødt kjøtt, og 2) reduksjon av subsidier til produksjon av rødt kjøtt- vil kunne bidra til å redusere forbruket av rødt kjøtt, og dermed nasjonale CO_2-utslipp. I hvilken grad er du enig eller uenig i følgende utsagn: *For å bekjempe klimaendringene så bør den norske regjeringen:* A. *Innføre en avgift på rødt kjøtt* (storfe, kalv og

sau/lam) tilsvarende en prisøkning for rødt kjøtt på 7,18 kroner per kilo, og øremerke skatteinntektene til å redusere momsen på norskprodusert fisk og sjømat, da det vil gjøre disse matvarene billigere.

B. *Redusere skattefinansierte subsidier til produksjon av rødt kjøtt* (storfe, kalv og sau/lam) med 10 prosent, som vil øke prisen for rødt kjøtt med 7,18 kroner per kilo, og heller bruke midlene til å redusere momsen på norskprodusert fisk og sjømat, da det vil gjøre disse matvarene billigere.

Svaralternativer for begge spørsmålene: 1. Helt enig, 2. enig, 3. litt enig, 4. Verken enig eller uenig, 5. Litt uenig, 6. Uenig, 7. Helt uenig.

sau/lam) tilsvarende en prisøkning for rødt kjøtt på 7,18 kroner per kilo, og øremerke skatteinntektene til å redusere momsen på norskproduserte vegetar- og kjøtterstatnings produkter, da det vil gjøre disse matvarene billigere.

B. *Redusere skattefinansierte subsidier til produksjon av rødt kjøtt* (storfe, kalv og sau/lam) med 10 prosent, som vil øke prisen for rødt kjøtt med 7,18 kroner per kilo, og heller bruke midlene til å redusere momsen på norskproduserte vegetar- og kjøtterstatnings produkter, da det vil gjøre disse matvarene billigere.

Svaralternativer for begge spørsmålene: 1. Helt enig, 2. enig, 3. litt enig, 4. Verken enig eller uenig, 5. Litt uenig, 6. Uenig, 7. Helt uenig.

Questions for respondents in Survey 2

Gruppe 1 (kontroll)

I hvilken grad er du enig eller uenig i følgende påstand:

Den norske regjeringen bør redusere skattefinansierte subsidier til produksjon av rødt kjøtt med 10 prosent, som vil øke prisen på rødt kjøtt med cirka 7,18 kroner per kilo, og heller bruke midlene til å redusere momsen på norskproduserte grønnsaker, frukt og bær, da det vil gjøre disse matvarene billigere.

Svaralternativer: 1. Helt enig, 2. enig, 3. litt enig, 4. Verken enig eller uenig, 5. Litt uenig, 6. Uenig, 7. Helt uenig.

Gruppe 2 (helse)

Nasjonale kostråd oppfordrer til å øke forbruk av frukt og grønt som vil være helsefremmende, og å begrense forbruk av rødt kjøtt grunnet link mellom høyt inntak og en rekke livsstilssykdommer (som fedme, kreft, hjerteinfarkt og diabetes).

I hvilken grad er du enig eller uenig i følgende påstand:

Den norske regjeringen bør redusere skattefinansierte subsidier til produksjon av rødt kjøtt med 10 prosent, som vil øke prisen på rødt kjøtt med cirka 7,18 kroner per kilo, og heller bruke midlene til å redusere momsen på norskproduserte grønnsaker, frukt og

Gruppe 4 (personlig økonomi)

En gjennomsnittlig husholdning betaler 11 000 kroner i landbrukssubsidier gjennom skatteseddelen årlig. 47 % av disse går til produksjon av rødt kjøtt, mens bare 6 % går til planter som kan konsumeres direkte. Høye subsidier påvirker prisen på varer i butikken.

I hvilken grad er du enig eller uenig i følgende påstand:

Den norske regjeringen bør redusere skattefinansierte subsidier til produksjon av rødt kjøtt med 10 prosent, som vil øke prisen på rødt kjøtt med cirka 7,18 kroner per kilo, og heller bruke midlene til å redusere

bær, da det vil gjøre disse matvarene billigere.

Svaralternativer: 1. Helt enig, 2. enig, 3. litt enig, 4. Verken enig eller uenig, 5. Litt uenig, 6. Uenig, 7. Helt uenig.

momsen på norskproduserte grønnsaker, frukt og bær, da det vil gjøre disse matvarene billigere.

Svaralternativer: 1. Helt enig, 2. enig, 3. litt enig, 4. Verken enig eller uenig, 5. Litt uenig, 6. Uenig, 7. Helt uenig.

Gruppe 3 (nasjonal økonomi)

Nasjonale helseutgifter knyttet til konsekvenser av for lavt inntak av frukt og grønt er beregnet av Helsedirektoratet til å koste staten 60 milliarder kroner årlig. Samtidig er helseutgifter knyttet til for høyt inntak av rødt kjøtt beregnet å koste samfunnet 30 milliarder årlig.

I hvilken grad er du enig eller uenig i følgende påstand:

Den norske regjeringen bør redusere skattefinansierte subsidier til produksjon av rødt kjøtt med 10 prosent, som vil øke prisen på rødt kjøtt med cirka 7,18 kroner per kilo, og heller bruke midlene til å redusere momsen på norskproduserte grønnsaker, frukt og bær, da det vil gjøre disse matvarene billigere.

Svaralternativer: 1. Helt enig, 2. enig, 3. litt enig, 4. Verken enig eller uenig, 5. Litt uenig, 6. Uenig, 7. Helt uenig.

Gruppe 5 (rettferdighet)

En gjennomsnittlig husholdning betaler 11 000 kroner i landbrukssubsidier gjennom skatteseddelen årlig, hvorav omtrent halvparten (47%) går til produksjon av rødt kjøtt. Alle er altså med på å subsidiere produksjon av rødt kjøtt, også de som prøver å redusere kjøttforbruket sitt av hensyn til helse, klima eller dyrevelferd.

I hvilken grad er du enig eller uenig i følgende påstand:

Den norske regjeringen bør redusere skattefinansierte subsidier til produksjon av rødt kjøtt med 10 prosent, som vil øke prisen på rødt kjøtt med cirka 7,18 kroner per kilo, og heller bruke midlene til å redusere momsen på norskproduserte grønnsaker, frukt og bær, da det vil gjøre disse matvarene billigere.

Svaralternativer: 1. Helt enig, 2. enig, 3. litt enig, 4. Verken enig eller uenig, 5. Litt uenig, 6. Uenig, 7. Helt uenig.

Paired t-test

```
Paired t-test

data:  dataset1$tax_agreement and dataset1$subsidy_agree
t = -5.2977, df = 1014, p-value = 1.438e-07
alternative hypothesis: true mean difference is not equal to 0
95 percent confidence interval:
 -0.2632805 -0.1209559
sample estimates:
mean difference
   -0.1921182
```

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