Public and political acceptability of a food tax shift – An experiment with policy framing and revenue use

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ABSTRACT

This article studies the attitudes of the public and politicians toward a tax on red and processed meat in Sweden, and how acceptability is affected by framing the tax as either: 1) a climate tax, 2) a public health tax, or 3) both a climate and public health tax, as well as specifying the use of tax revenues to a) support agriculture, b) support further climate [public health] initiatives, c) reduce VAT on broad categories of foods, or d) reduce VAT specifically on fruit and vegetables. These revenue uses were designed to isolate the impact of effectiveness, cost-neutrality and compensation of affected groups. Experimental survey-data were collected from 3,233 citizens and 1,253 politicians. The results showed that framing the tax had no effect on politicians and only a minor one on citizens; they became slightly more positive about the combined climate and public health justification compared to solely public health. The acceptability was generally greater when revenues were specified as opposed to unspecified, but the two cost-neutral revenue uses (a tax shift entailing either a broad reduction of VAT or just on fruit and vegetables) were the most acceptable proposals to both the public and politicians. The feasibility of implementing a tax on red and processed meat could be improved by ensuring that the average consumer's total food costs do not increase and that any revenues are used to enhance the effectiveness of such a tax.

1. Introduction

Although red and processed meat is an important source of nutrients, their production and consumption is a major contributor to climate change and adverse health effects. Livestock production is estimated to account for 12–16 % of the total anthropogenic global greenhouse gas (GHG) emissions, with cattle contributing to well over half of global livestock emissions (FAO, 2023a). When it comes to health impacts, a recent scoping review (Meinilä & Virtanen, 2024) found strong evidence that processed meat[1] increases the risk of colorectal cancer, and probable evidence that red meat[2] also increases this risk. Both unprocessed red meat and processed meat (including processed poultry) are probable risk factors in cardiovascular mortality and stroke, and total red and processed meat consumption levels are risk factors in coronary heart disease. Overall, the evidence for negative health effects is stronger for

processed meat than for red meat.

While, theoretically, an important disadvantage of consumption-side policies is the weak incentives for technical improvements to production, the actual potential of technological solutions to reduce GHG emissions in the agricultural sector has been found to be small (Springmann et al., 2018). An advantage of policy measures aimed at decreasing the consumption of red and processed meat is the potential to simultaneously mitigate both environmental impacts and health risks. Moreover, nationally implemented policies on the consumption side have the advantage of targeting both domestically produced and imported meat. Health information may be an acceptable type of measure for discouraging harmful consumption, but information alone is not as effective in altering behavior as pricing mechanisms (Ammann et al., 2023; Walter, 2020). Rather, consumption taxes on emission-intensive foods, like red and processed meat, can be cost-efficient measures to

[1] Processed meat refers to e.g. red or white meat preserved by smoking, curing, or fermenting, or by the addition of salt and other preservatives.
[2] Red meat is derived from pigs, cows, and lamb, while white meat comes from chicken and turkey.

both reduce GHG emissions and alleviate public health concerns through price-driven behavioral changes (e.g., Broeks et al., 2020; Springmann et al., 2017; Vandenberghe & Albrecht, 2018). However, introducing new taxes on meat consumption might be difficult as people generally tend to be more negatively disposed toward policy measures that imply direct personal costs (Fesenfeld et al., 2020; Diepeveen et al., 2013).

The large body of literature examining the interplay between public policy and public opinion points toward public opinion as a key factor in understanding policy development. This is because politicians may be reluctant to propose unpopular measures that could meet opposition from voters and affect electoral outcomes (Wallner, 2008; Burstein 2003; Glynn et al., 1999). The presence of political responsiveness (politicians' decision-making either observing or attempting to cater to the opinions of citizens) is well-established in the literature (e.g., Esaiasson & Wlezien, 2017; Erikson et al., 2002). However, there are also examples of politicians (in contrast to pure office-seeking strategies) both proposing and implementing policies despite stiff public opposition (Butler, 2023; Salmon, 1993). This suggests that politicians' personal positions can also influence decision-making behavior, even though there are reasonable arguments for vote-maximizing politicians to be highly responsive to public opinion. Furthermore, the relationship between public opinion and the political elites is bidirectional, as the public both notices and reacts to elite cues (Bullock, 2011; Cohen, 2003; Santoro et al., 2021), the perceived effects of new policies (Wlezien & Soroka, 2012), and attempts to sway public opinion through e.g. framing (Petrovic et al., 2014; Severson & Coleman, 2015) or by the design of the policy instrument itself (Maestres-Andres et al., 2021).

Thus, to comprehensively analyze the feasibility of a policy, attitudes toward a proposal should be analyzed among both the general public and decision-makers. Furthermore, exploring the potential of affecting policy attitudes through framing and policy design allows for a better understanding of the mechanisms at work. In this study, we assess the attitudes of both citizens and politicians to a proposed Swedish tax on red and processed meat, considering the effects of design, framing and individual predictors. The primary aim is to investigate whether varying both the justification for the tax and the use of tax revenue affects acceptability. The secondary exploratory aim of this study is to compare the attitudes of Swedish citizens and politicians. Finally, we will consider the additional influence of individual-level and demographic variables on policy attitudes.

2. Theory and hypotheses

The acceptability of different types of environmental and health policies is often associated with similar factors. Specific beliefs about the policy being implemented, like perceiving it to be effective, fair and entailing low personal costs, are usually associated with greater policy support (Huber et al., 2019; Lavin & Timpson, 2013; Sælen & Kallbekken, 2011). A greater level of coercion, like implementing taxes as opposed to subsidies and information, typically decreases support (Cherry et al., 2012; Reynolds et al., 2019), while other aspects of policy design, like earmarking tax revenue, can increase the acceptability of taxes (Baranzini & Carattini, 2017; Purtle et al., 2024). Furthermore, attitudes toward health and environmental policies are typically affected by individual-level factors like values, ideology and trust as well as demographic factors like education (Barry et al., 2023; Bergquist et al., 2022; Eykelenboom et al., 2021). We now turn to the more specific research into the acceptability of meat reduction policies.

2.1. Individual characteristics

Being concerned about the environment, having a greater degree of trust in government (Pechey et al., 2022) and viewing climate change as a prioritized societal issue (Grimsrud et al., 2020; Khan et al., 2023) has been shown to predict support for meat reduction policies. In terms of

demographic factors, higher education, being ideologically left-wing, female (Khan et al., 2022), younger age, and residing in more urban areas (Grimsrud et al., 2020) tend to positively predict support for a meat tax. Gender does not always have a straightforward relationship with the acceptability of environmental policies (Ejelöv & Nilsson, 2020). However, men tend to consume more red meat than women (Rosenfeld & Tomiyama, 2021), which, in turn, is a strong negative predictor of support for meat reduction policies (Grimsrud et al., 2020; Pechey et al., 2022). These individual-level factors appear to be rather stable predictors of support for environmental and public health policies in general, and support for meat reduction policies in particular. However, individual and demographic factors are not usually readily malleable and might not, therefore, be utilized to increase support. For this, we turn to research into framing and policy design.

2.2. Framing

The acceptability of environmental taxes can be affected by communication or framing. For example, labelling a tax as a "fee" as opposed to a "tax" can result in greater willingness-to-pay (Kallbekken et al., 2011). Some research also suggests that framing climate change in itself as a public health issue rather than an environmental one may yield more positive attitudes toward a policy (Petrovic et al., 2014). Dasandi et al (2022), compared the effects across five countries and found that framing climate change as either a health or environmental issue consistently increased policy support, while framing it as an economic issue did not. Notably, for those not already concerned about climate change, only the health framing significantly increased policy support.

In the context of a meat tax, a UK study found that justifying a meat tax as a means of reducing either climate or public health impacts did not affect acceptability (Pechey et al., 2022). Similarly, in three countries (the US, China, and Germany), framing a meat tax as reducing harm to either animal welfare, climate, the local environment, or personal health did not affect support for policies aimed at reducing meat and fish consumption (Fesenfeld et al., 2021). However, a German study found an animal welfare tax received significantly more support than a tax justified by climate-change mitigation (Perino & Schwickert, 2023). In this study, we omit testing an animal welfare framing for red meat. In contrast to taxes for public health and climate, a Swedish animal welfare tax (based on the animal welfare index in the SAFAD-tool https://safad.se/) would mainly affect the price of poultry which makes it poorly suited for a tax on red meat.

Given that high consumption of red and processed meat has a negative impact on both public health and the climate, we will test the effects of these framings, both separately and in combination. Which justification is more acceptable may depend on whether people view red meat as mainly causing either emissions or negative public health effects, or on them taking a principled stance on which of the two justifications is more acceptable to influence by policy. Swedish consumers appear to be aware that consuming red meat impacts both the environment and public health (albeit with a relatively weaker belief in the health effects) (Röös et al., 2022). Therefore, justifying a meat tax with both public health and climate aims (rather than using a single aim) might garner the support of two population segments that prioritize different societal issues and so increase acceptability. Thus, we formulate our first hypothesis as:

H₁: A combined aim (tax aim to limit consequences to both public health and the climate) will yield higher tax acceptability than a single aim (tax aim to limit consequences to public health or the climate).

2.3. Design

Taxes are often less preferred over other types of policies like voluntary or rewarding measures such as health information or subsidies (Drews & Van den Bergh, 2016; Ejelöv & Nilsson, 2020). In assessing a

range of different meat reduction policies in the UK, increasing the price of meat was found to be the second least acceptable type of policy after banning advertisements, with only 27 % of respondents in favor (Pechey et al., 2022). However, acceptability can generally increase when taxes are introduced in conjunction with more voluntary or complementary policies, such as subsidies (Eriksson et al., 2008), or when introduced as part of a more comprehensive policy package (Fesenfeld et al., 2020). Environmental and public health taxes also tend to receive greater support when tax revenues have been specified (Barry et al., 2023; Maestres-Andres et al., 2021). Possible revenue uses typically studied range from: funding environmental projects; compensating low-income earners or redistributing revenues equally to all citizens; reducing other taxes; and adding revenues to the general budget (Valencia et al., 2023). While all of these uses could affect acceptability via different mechanisms, the generally positive effect of specifying revenue use is argued to be due to increased trust in the tax system because it increases transparency (Barry et al., 2023). Our second hypothesis therefore suggests that:

H_2: Specifying how revenues from the tax will be used will yield higher tax acceptability than not specifying how revenues from the tax will be used.

While specifying revenues appears to generally increase tax acceptability, using revenues specifically for other environmental projects or investments is typically the most favored use (Klenert et al., 2018; Matti et al., 2022; Valencia et al., 2023). Using revenues for environmental projects has also been shown to increase the acceptable tax level for a Norwegian meat tax. However, the most preferred use of revenues for such a tax was to reduce the VAT on fruit and vegetables, followed by financial support for agriculture (Grimsrud et al., 2020). The more common preference for spending revenues on environmental projects is thought to mainly be due to increased policy effectiveness (Maestres-Andres et al., 2021). However, using revenues to reduce the VAT on fruit and vegetables might be viewed as both an effectiveness measure and a means of reducing the personal cost of a tax. In this study, we will test the separate and combined effects of increased policy effectiveness and increased personal cost, as well as the separate effect of compensating affected groups (in this instance, Swedish farmers). Based on the above-cited research, our third hypothesis is that:

H_3: Earmarking revenues with the aim to increase the effectiveness of the tax will yield higher tax acceptability than any of the other revenue uses.

3. Case and method

In this study, we collect data from Swedish citizens and politicians. As part of the EU Fit for 55 package, Sweden will need to reduce its GHG emissions from the sectors not included in the Emissions Trading System (mainly transport and agriculture) by 50 % by 2030, compared to 2005 levels (Regulation 2023/857/EC). In 2022, agriculture contributed 14 % of the total territorial emissions in Sweden, with livestock production accounting for around half of this (Naturvårdsverket [the Swedish Environmental Protection Agency], 2023). In an international comparison, Sweden has a high per capita level of red meat consumption; around twice the global average but similar to the EU average (FAO, 2023b). The average consumption of red and processed meat in Sweden is 530 g per week (Livsmedelsverket, 2012). This can be compared to the recommended maximal intake, for health reasons, of 350 g/week in the 2023 Nordic Nutrition Recommendations. However, these recommendations emphasize that, for environmental reasons, the intake should be much lower than that (Blomhoff et al., 2023). Besides the reduced VAT level of 12 % on all foods (standard VAT being 25 %), Sweden does not currently have any economic policy instruments steering the consumption of food. However, Sweden does have a long history of environmental politics and taxation in other sectors (Lundqvist, 2004; Heidenblad, 2021), as well as the taxation of harmful substances such as alcohol and tobacco.

The prospect of steering food consumption through taxation has gained increasing attention in Sweden. Mirroring the global trend,

where over 100 jurisdictions have implemented taxes on sugar-sweetened beverages (World Bank Global SSB Tax Database), the Swedish Liberal party proposed a producer fee on these beverages in 2022 (Motion 2022/23:1127). Similarly, in 2018, the Green party advocated for a meat tax based on antibiotic usage in production (Motion 2018/19:2299). Although neither proposal was enacted, they underscore a heightened focus on health-related pricing strategies. Additionally, the topic of a climate motivated meat-tax has increasingly garnered media attention in the last few years (Bendz et al., 2023; Jakobson, 2018; Kalmström & Paulsson, 2017; Zachrisson Wiberg, 2018), and in a 2024 report, the Nordic Council of Ministers advocated for the introduction of a Nordic-wide meat tax (Nordic Council of Ministers, 2024).

The Public Health Agency of Sweden and the National Food Agency were commissioned by the 2018–2022 government to formulate proposals for national food consumption goals. Their primary objective is to ensure that food consumption supports improved and more equitable health outcomes, while also minimizing impacts on climate, biodiversity, and ecosystems (Public Health Agency of Sweden, 2024). One of the proposed sub-goals is a reduction in meat consumption with 30 % by 2035 relative to 2021 levels. Although taxing red meat has been proposed as a method to achieve this reduction, a recent report indicates that a majority of Swedish political parties oppose using pricing mechanisms to influence food consumption (Reformaten, 2024). Opposition stems from a variety of reasons, including preferences for resolving such issues at the EU level, favoring voluntary measures like labeling, concerns about high administrative costs, and the belief that taxes should fund welfare rather than modify consumer behavior. The reluctance among politicians may be attributed to ideological and individual preferences (Butler, 2023), perceptions of public preferences (Esaiasson & Wlezien, 2017), and technical challenges such as the administrative burden of tax reforms. Several parties, including the minister of agriculture, continue to support increasing meat production in Sweden, in line with the nation's 2016 food strategy (Kullgren, 2023). Given the current political resistance to a meat tax, exploring factors that could enhance its acceptability is crucial for the development of feasible policies.

Voters in Sweden currently view health care as a more prioritized societal issue than climate issues and is not as strongly polarized along ideological lines (Martinsson, 2023). A public health frame or a combined public health and climate frame might for this reason garner more support from politicians than a climate frame. Given that politicians might be more sensitive to the administrative burden of tax reforms than citizens are, politicians might not respond favorably to specifying use of revenue as citizens have been shown to do, due to the increased administrative burden of such a design. However, if politicians have similar preferences as the public or are basing their attitudes on perceptions of public preferences, they too might become more positive when revenues are specified rather than unspecified.

We argue that Sweden represents a suitable context for studying the acceptability of a meat tax. Swedish citizens have extensive experience with various environmental and health-related taxes, which facilitates a focused examination of attitudes specifically toward meat taxation, rather than general tax sentiment. Additionally, Sweden's meat consumption is comparable to the average across the European Union, enhancing the generalizability of the findings within the European context. The production of red meat per capita in Sweden is similar to countries like Finland, Norway and Portugal, while other countries like Denmark, the Netherlands and the United States has a higher production (Eurostat, 2024; Ritchie et al., 2024).

3.1. Participants

Participants were recruited using the Citizen Panel and Politician Panel run by the SOM Institute, University of Gothenburg. The full Citizen Panel consists of around 60,000 participants, while the full

Politician Panel consists of around 3,000 politicians. The survey period for the Citizen Panel was between May 31st and June 27th 2023, during which two reminders were sent out. The survey was distributed to 5,500 people from the Citizen Panel, stratified by gender, education, and age to be representative of the Swedish population, and 3,233 (59 %) participants responded. The survey period for the Politician Panel was between June 12th and August 30th 2023. The survey was distributed to the full Politician Panel and 1,253 (42 %) of the politicians responded (see Table 1 for sample descriptives). The decision to send out the survey to 5500 respondents from the Citizen Panel and the 3000 respondents from the Politician Panel was made by the SOM Institute based on our desired sample sizes and the expected response rate of the panels. The politician panel consists of politicians at various levels: EU, national, regional, and local. Decisions on tax changes are made primarily at the national level (in rare cases at the EU level). However, the attitudes of politicians at other levels are also of great relevance since policies, including tax issues, are determined at the parties' annual internal party conferences and politicians at all levels are active opinion leaders, for example during election campaigns. Out of the 1253 politicians included in the sample, 76 % are active at a local level, 19 % at a regional level, 4 % at a national level, and 0.05 % at an EU level. The average time served as an elected official was 20 years.

The power calculation and analysis plan were pre-registered and can be found at: https://osf.io/2sk4q/?view_only=55ac3906be1f4f458eee459b74b6bba3.

3.2. Power analysis

A power analysis for repeated measures ANOVA with 80 % power to detect a small between-subjects effect size of $f = 0.06$ at the standard 0.05 alpha error probability assuming a within-measure correlation of $r = 0.5$, yielded a total sample size of 2,148 participants. Due to the possibility of missing data and uncertain assumptions about the strength of correlation for the within-measures, we decided to collect data from 3,000 participants from the Citizen Panel and aimed for a sample of 1,300 participants (the estimated probable sample size when distributing the survey to the full panel) from the Politician Panel (i.e., a total sample size of 4,300).

3.3. Procedure and materials

Participants were randomly assigned to one of the three experimental conditions (aim of tax: public health vs climate, vs public health and climate) and responded to five different tax proposals. The Health/climate support use and the Greens VAT reduction use were designed to highlight that the measures will increase the effectiveness of the tax, and the Greens VAT reduction and the Broad VAT reduction use were designed to highlight that the measures will be cost-neutral for consumers. The agricultural support measure does not highlight increased tax effectiveness of cost-neutrality, but instead redirects funds to groups affected by the tax (see Table 2 for full descriptions).

Acceptability was assessed by asking: *What is your position toward this proposal?* with responses measured on a seven-point scale ranging from 1 to *Very negative* to 7- *Very positive*. The first proposal was neutral

Table 1
Descriptives for the citizen and politician samples, and comparison with Swedish populations.

	Citizen sample (N = 3,233)	Swedish citizen population (Statistics Sweden, 2023)	Politician sample (N = 1,253)		Swedish politician population (Statistics Sweden, 2023)
Gender					
Female	48.4 %	49.65 %	33.4 %		43 %
Male	51.6 %	50.35 %	65.8 %		57 %
Age groups					
Under 30	8.4 %	15.17 %	2.2 %	*18–29 years*	6 %
30–39	13.8 %	18.39 %	6.7 %	*30–49 years*	28 %
40–49	16.8 %	15.98 %	14.4 %	*50–64 years*	33 %
50–59	19.3 %	16.51 %	20.0 %	*+ 65 years*	33 %
60–69	20.9 %	13.90 %	25.0 %		
+ 70 years	20.8 %	20.04 %	31.7 %		
Education					
Primary education	3.6 %	15.91 %	3.1 %	*Primary education*	3 %
Secondary education – less than 3 years	12 %	17.6 %	6.9 %	*Secondary education*	32 %
Secondary education – 3 years	17.3 %	24.63 %	9.5 %	*Post-secondary education*	64 %
Post-secondary education – less than 3 years	33.5 %	15.83 %	20.3 %		
Post-secondary education – more than 3 years	33.7 %	26.04 %	60.1 %		
Rural/urban residence		**Statistics Sweden rural/urban categorization (2019)**			
Large city: central	15.9 %	*Major urban municipalities*			33.5 %
Large city: outer area/suburb	21.4 %	*Dense mixed municipalities*			43.4 %
City: central	14.5 %	*Sparse mixed municipalities*			6.7 %
City: outer area	12.3 %	*Urban-adjacent rural municipalities*			9.9 %
Larger town	5.8 %	*Sparse rural municipalities*			5.7 %
Smaller town	16.7 %	*Very sparse rural municipalities*			0.8 %
Rural area	13.3 %				

Table 2

Description of tax proposals.

Name	Description	Components varied
Unspecified use	*The negative consequences of red meat consumption (red meat pertains to meat and charcuterie made from beef, pork and lamb) have been discussed over the last couple of years. To limit the negative consequences on [Public health condition: public health] [Climate condition: the climate] [Public health and climate condition: public health and the climate], one suggestion has been to introduce a tax on red meat. The purpose of raising the price of red meat would be to reduce the consumption of red meat. At the same time, the tax would raise revenues for the state. Imagine a tax that will increase the price of red meat by 20 %.*	
Agricultural support	*Imagine a tax that will increase the price of red meat by 20 % and that an amount corresponding to the tax revenue generated is used to support Swedish agriculture. The total effect is that the cost of the average grocery bag increases.*	• Cost-neutral: No • Increased effectiveness of tax: No
Broad VAT reduction	*Imagine a tax that will increase the price of red meat by 20 % and that an amount corresponding to the tax revenue generated is used to lower the VAT on other foods. The total effect is that the cost of the average grocery bag **does not** increase.*	• Cost-neutral: Yes • Increased effectiveness of tax: No
Health/climate support	*Imagine a tax that will increase the price of red meat by 20 % and that an amount corresponding to the tax revenue generated is used to finance actions that further benefit [public health] [the climate] [public health and the climate]. The total effect is that the cost of the average grocery bag increases.*	• Cost-neutral: No • Increased effectiveness of tax: Yes
Greens VAT reduction	*Imagine a tax that will increase the price of red meat by 20 % and that an amount corresponding to the tax revenue generated is used to lower the tax on foods that further benefits [public health] [the climate] [public health and the climate], such as fruit, vegetables, and plant-based protein. The total effect is that the cost of the average grocery bag **does not** increase.*	• Cost-neutral: Yes • Increased effectiveness of tax: Yes

regarding revenue use, followed by four randomly ordered proposals with specified revenue uses. After rating acceptability, participants were given two free-text questions for each proposal on what advantages and disadvantages they perceived in the described proposal.

To get an understanding of Swedish citizens' preference for taxing red meat relative to other food groups, participants from the Citizen Panel were also asked to indicate their preference for changing the current tax level on different food groups, with the question: *Sweden currently has the same tax rate for all foods (12 % VAT). However, it is possible to have different tax rates (VAT or excise duty) on different foods. At a higher tax rate (i.e., higher price), people tend to consume less of that product, while a lower tax rate (i.e., lower price) instead tends to lead to increased consumption. If Sweden were to raise the tax on some foods and lower the tax on some other foods, which tax rate would you prefer for the following foods?* (see Table 8 for all food groups). Respondents could choose *Lower tax rate, Maintain tax rate,* or *Higher tax rate.*

Red meat consumption was assessed using the question: *How many days per week do you usually eat red meat?* Responses ranged from *Daily, 5–6 days per week, 3–4 days per week, 1–2 days per week, More seldom, Never.*

Lastly, the importance of climate and public health as political issues

was assessed via two items: *How important do you consider [climate] [public health] issues to be compared to other societal issues?* This was rated on an 11-point scale with responses ranging from *0 – Not at all as important as most other societal issues,* to *5 – As important as most other societal issues,* to *10 – Much more important than most other societal issues.*

The SOM Institute, University of Gothenburg provided citizen background information regarding age, gender, political ideology, party voted for in the latest election, rural/urban residence, education, income, political and general trust, and politician background information regarding age, gender, education and party affiliation (see Table S3. in the Appendix for descriptive statistics).

3.4. Statistical analysis

Due to acceptability of tax proposal being a repeated measure, hypotheses were tested using a linear mixed model via the lme4 package in R. We opted for using a linear mixed model over other analyses, such as repeated measures ANOVA, since linear mixed models utilize all available data and are robust against violations of distributional assumptions (Schielzeth et al., 2020). To check the robustness of the results from the linear mixed model, we also performed the same test using repeated measures ANOVA and obtained the same results (see Tables S4.-S8. in the Appendix), with the exception of one pairwise comparison which was not significant in the original analysis. For the linear mixed model, participants were specified as random effects, experimental conditions (public health vs climate vs combined aim), revenue use, and group (citizen vs politician) were specified as fixed effects, and acceptability was specified as a dependent variable. The three hypotheses were tested in the main effect model and reported in the confirmatory sections. We then tested the main effects, two-way interactions and three-way interactions of the fixed effects in three separate models, and compared them using likelihood-ratio tests. The two-way interaction model was retained as a likelihood-ratio test for the main effect and two-way interaction model: $p < 0.001$; while the likelihood-ratio test for the two-way interaction model and three-way interaction model: $p = 0.302$, indicated that the two-way interaction model best explained the data. Significant interactions from the two-way interaction model were followed up with pairwise comparisons using the emmeans package, as reported in the exploratory sections. All pairwise comparisons were Bonferroni corrected, and associated effect sizes were calculated using the eff_size function in the emmeans package.

4. Results

The results are divided into three sections: framing, tax design, and lastly the effects of individual factors. The first two sections are further divided into confirmatory analysis (where we test our hypotheses with the linear mixed model) and exploratory analysis.

Besides the results from the linear mixed model, the exploratory tax design section further consists of a free-text analysis of objections to the revenue uses and descriptive results on preferred tax levels. Meanwhile, the exploratory section on individual factors consists of multiple regressions for each group (citizen vs politician) and tax proposal (unspecified use, health/climate support, agricultural support, broad VAT reduction, greens VAT reduction) to assess whether demographic and individual-level variables predict acceptability in the same way for the two groups across the proposals.

As an overview, Figs. 1 and 2 show the mean acceptability levels of the different tax designs per framed tax aim, and for citizens and politicians respectively. While the distributions for Unspecified use, Agricultural support and Health/climate support are negatively skewed, the Broad VAT reduction and Greens VAT reduction show a more uniform distribution (see Figure S1 in the Appendix).
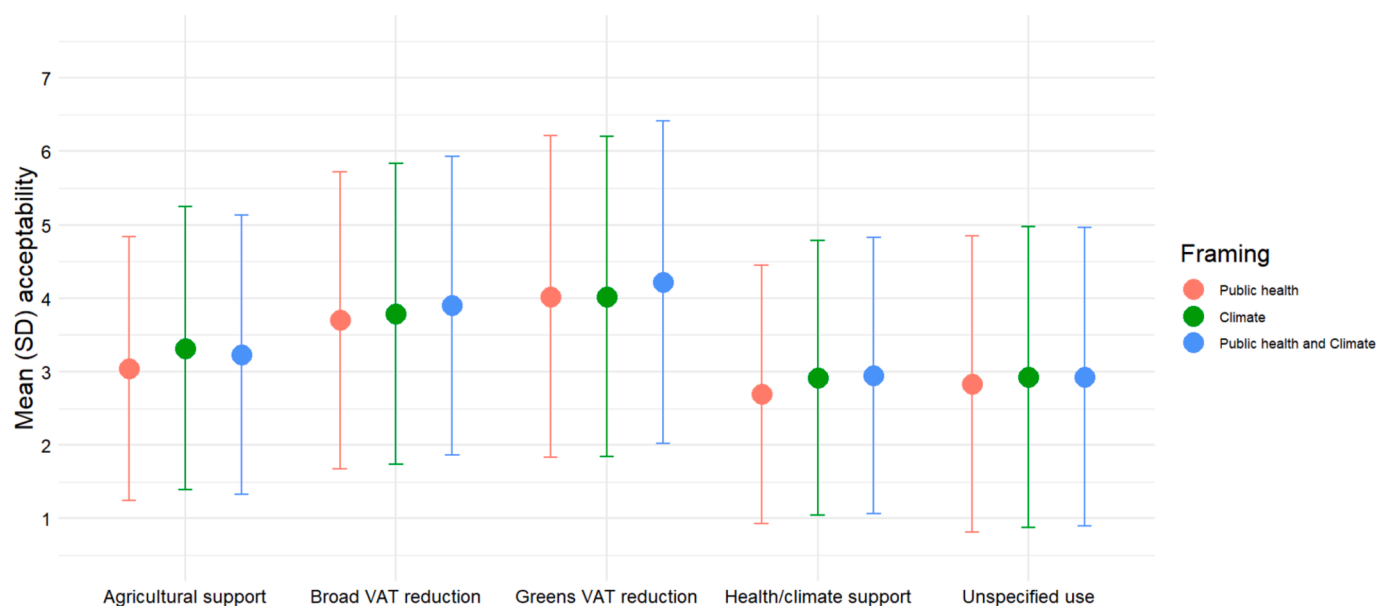
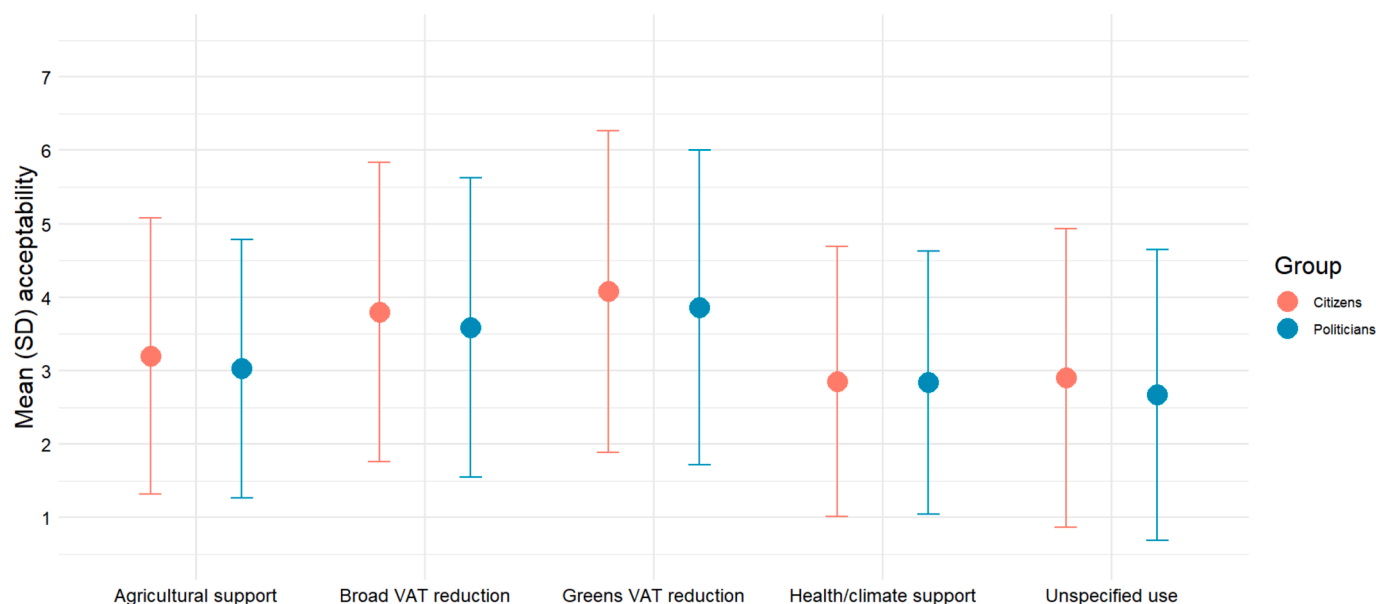**Fig. 1.** Acceptability of tax proposals per experimental condition (for politicians and citizens combined).

Fig. 2. Acceptability of tax proposal for citizens and politicians respectively (for framing conditions combined).

4.1. Framing of tax aim

4.1.1. Confirmatory analysis

Hypothesis 1was not supported, since the tax aim had no significant main effect on acceptability. Using a combined climate and public health justification for the meat tax did not yield greater overall acceptability, compared to using either a public health aim (p = 0.140) or a climate aim (p = 0.795, see Table S1 in the Appendix).

4.1.2. Exploratory analysis

While no general effect of tax aim was observed when looking at the combined effect for citizens and politicians, we did see a significant interaction between tax aim and group (see Table S2 in the Appendix). For the citizen sample, using a combined public health and climate justification for the meat tax increased its acceptability relative to the public health aim but not the climate aim. However, the significant

framing effect was quite small (effect size = 0.17). The aim of the tax did not significantly affect its acceptability among politicians (see Table 3). While both the public health aim and climate aim yielded similar acceptability levels for citizens and politicians, citizens held significantly more positive attitudes toward the combined public health and climate aim than did politicians (effect size = 0.31) (see Table 4). None of the interactions between framing and revenue use were significant when followed up with Bonferroni-adjusted pairwise comparisons (see Table S2 in Appendix), and the results are thus not reported.

4.2. Tax design

4.2.1. Confirmatory analysis

Hypothesis 2 was largely supported, as the acceptability of the tax was greater when the revenue use was specified, with the exception of using revenues for further public health/climate support (i.e., increased

Table 3

Pairwise comparisons of estimated marginal means of acceptability of tax aim, for citizens and politicians respectively ($N = 4450$).

	Climate			Public health and climate		
	Mean difference (*SE*)	*t*-ratio	Effect size	Mean difference (*SE*)	*t*-ratio	Effect size
Citizens						
Public health	−0.15 (0.07)	−2.02	0.13	−0.20 (0.07)	−2.66 *	0.17
Climate				−0.05 (0.07)	−0.67	0.04
Politicians						
Public health	−0.01 (0.12)	−0.12	0.01	0.16 (0.12)	1.38	0.14
Climate				0.18 (0.12)	1.50	0.15

Note: Mean difference indicates row – column.
Significance levels: *** = p < 0.001, **= p < 0.01, *= p < 0.05.

Table 4

Pairwise comparisons of estimated marginal means of acceptability, for interaction between tax aim and group (citizen vs politician) ($N = 4450$).

	Politicians		
	Mean difference (*SE*)	*t*-ratio	Effect size
Citizens			
Public health aim	0.01 (0.10)	0.06	0.01
Climate aim	0.14 (0.10)	1.44	0.12
Climate and public health aim	0.36 (0.10)	3.68***	0.31

Note: Mean difference indicates row – column.
Significance levels: *** = p < 0.001, **= p < 0.01, *= p < 0.05.

effectiveness measure) (see Table 5 and Fig. 2, and Table S1 in the Appendix).

Hypothesis 3 was not supported, since the effects of designs for increased effectiveness were subordinate to those from a cost-neutral design. Although using revenues to reduce VAT on greens yielded the greatest support, the plain financing of effectiveness measures (health/climate support) was the least supported alternative. Rather, the main pattern was that the two most favored revenue uses were the cost-neutral ones; the broad VAT reduction and greens VAT reduction.

4.2.2. Exploratory analysis

Concerning whether or not citizens and politicians held similar attitudes toward the different revenue uses, we observed a significant interaction between how citizens and politicians evaluated the

unspecified revenue use and public health/climate support (see Table S2 in the Appendix). Pairwise comparisons showed that, while citizen attitudes did not significantly differ between the unspecified use and support for public health/climate (*MD* = 0.05 (*SD* = 0.03), *t*-ratio = 1.66, effect size = 0.04), politicians held more positive attitudes toward the support for public health/climate than toward the unspecified use (*MD* = -0.17 (*SD* = 0.05), *t*-ratio = -3.66**, effect size = 0.15).

Furthermore, citizens were more positive toward all tax proposals compared to politicians, except for public health/climate support (See Table 6).

To further the understanding of objections to the different revenue uses, we also analyzed the negative free-text comments (from the citizen sample) on the four tax proposals with specified revenue uses. Only comments paired with a negative attitude to the proposal were included (i.e., 1–3 on a 1–7 scale). We only analyzed the objections of individuals who were negative toward the proposal as these might be more likely causes to the individual's attitude compared to individuals who are positive. 4,119 text strings were analyzed manually using inductive coding. There were 52 different types of answers distinguished and grouped into nine main categories (see Table 7). Some text strings were given more than one code, which gave a total of 5,142. One coder did the initial sorting of text strings into descriptive sub-categories, and two coders agreed upon categorizations into conceptual main categories via discussion.

Fig. 3 shows how the counts of negative free-text comments differ between the different revenue uses. As might be expected, the cost-neutral proposals, i.e. broad and greens VAT reduction, clearly trigger fewer negative comments regarding personal finance. This pattern also shows up for the fairness category, which is dominated by comments on

Table 6

Pairwise comparisons of estimated marginal means of acceptability for interaction between revenue use and group (citizen vs politician) ($N = 4450$).

	Politicians		
	Mean difference (*SE*)	*t*-ratio	Effect size
Citizens			
Unspecified use	0.23 (0.07)	3.50***	0.20
Agricultural support	0.16 (0.07)	2.46*	0.14
Broad VAT reduction	0.21 (0.07)	3.17**	0.18
Health/climate support	0.01 (0.07)	0.13	0.01
Greens VAT reduction	0.23 (0.07)	3.48***	0.20

Note: Mean difference indicates row – column.
Significance levels: *** = p < 0.001, **= p < 0.01, *= p < 0.05.

Table 5

Pairwise comparisons of estimated marginal means of acceptability of revenue uses ($N = 4450$).

	Agricultural support			Broad VAT reduction			Health/climate support			Greens VAT reduction		
	Mean difference (*SE*)	*t*-ratio	Effect size	Mean difference (*SE*)	*t*-ratio	Effect size	Mean difference (*SE*)	*t*-ratio	Effect size	Mean difference (*SE*)	*t*-ratio	Effect size
Unspecified use	−0.31 (0.03)	−12.38 ***	0.27	−0.90 (0.03)	−35.46 ***	0.77	−0.02 (0.03)	−0.58	0.01	−1.18 (0.03)	−46.67 ***	1.01
Agricultural support				−0.59 (0.03)	−22.84 ***	0.50	0.30 (0.03)	11.69 ***	0.26	−0.87 (0.03)	−33.96 ***	0.74
Broad VAT reduction							0.89 (0.03)	34.54 ***	0.76	−0.28 (0.03)	−11.10 ***	0.24
Health/climate support										−1.17 (0.03)	−45.66 ***	1.00

Note: Mean difference indicates row – column.
Significance levels: *** = p < 0.001, **= p < 0.01, *= p < 0.05.

Table 7
Negative free-text comments grouped in main categories. Sub-categories come from manual inductive coding of comments (total counts of comments in brackets).

Main categories	Sub-categories	Description
Fairness (924)	Affects low-income households (478); Affects Swedish farmers (181); Wrong to differentiate between food types (119); Unfair (unspecified); Affects small local producers (20); Individuals should not take the cost (20); Affects rural areas (11); Disagree with redistribution (10); Basic needs should not be taxed (5); Affects schools/elderly homes (3)	Distributional effects, in particular negative economic effects for vulnerable groups.
Freedom (698)	Government should not intervene in people's choices (668); Too detailed management (30)	Limitation and intervention in free choice (negative liberty).
Personal finance (632)	Expensive food (621); Leads to inflation (11)	General effects on personal finance (without specified distributional aspects).
Effectiveness (533)	Not effective (unspecified) (253); Imports will increase (121); Cheap/bad meat production will increase (64); Pointless if only enforced in Sweden (46); Loopholes/black market (28); Symbolic politics (21)	Beliefs that the policy will not be effective to achieve its objectives.
Health/ environment (426)	Unhealthy/low-quality diet (203); The human body needs meat (89); Negative for biodiversity/natural pasture (71); Increased consumption of other bad foods (63)	Beliefs that the policy will have negative effects on health and/or environment.
Cost-efficiency (382)	Subsidies are bad for the market (125); Government distorts market economy (82); Expensive administration (79); Bureaucracy (73); Complicated (22); Makes trade expensive (1).	Beliefs that the policy will have negative effects on free markets and/or create high administrative costs.
Trust (333)	Do not trust government's usage of revenue (226); Food retailers will make profit/not lower prices (107)	Lack of trust in government or food industry.
Feasibility (177)	People will not support this/ political suicide (64); The tax will lower consumption so that the revenue will be too low (59); Will not work (38); Will only create polarization (12); People will not understand this (4)	Doubts about the feasibility of implementation.
Problem awareness (126)	Lacks sound scientific support (43); Wrong focus (28); Not necessary (24); The climate issue is exaggerated/a hoax (24); Populism (7)	Disagreement with the objective of the policy.
Other (509)	Negative to taxes in general (119); Too unspecific proposal (75); Can be done without taxing food (73); Wrong/ wasteful use of revenue (63); Meat is tasty (55); Affects national self-sufficiency (38); Illogical link between tax and revenue use (33); Don't understand the point (21); Moralism (21); Taxes cannot be earmarked (11)	

Table 7 (*continued*)

Main categories	Sub-categories	Description
Irrelevant (402)	General reflection (e.g. "no", "stupid") (253); Not interpretable (133); No drawbacks (14); Do not understand question (2)	

the effects on low-income households (52 %, see Table 7). The opposite pattern is found for the freedom category, in which the redistribution of meat taxes to lower VAT on other food types appears to be seen as more intrusive in people's choices. Revenue use for agricultural support triggers by far the largest number of comments on cost-efficiency. These comments comprise primarily negative views on current agricultural subsidies.

Besides the effect of revenue use on acceptability, we also investigated additional tax design effects by having the citizen sample indicate their preferred tax rates for different types of food groups. While framing the aim of a meat tax had a limited effect on acceptability, when asked about their preference for either lowering, maintaining, or increasing the current tax level on different foods, citizens indicated a rather clear preference for increasing taxes on energy-dense, nutrient-poor foods (such as candy and sugar-sweetened beverages) and lowering taxes on foods with health-promoting effects (and possibly lower climate/environmental impact) (see Table 8). A majority of the citizen sample preferred to maintain the current tax rate for the different protein-rich products (such as beef, dairy and eggs, and vegetarian meat substitutes). Relatively more people preferred to raise the tax level on beef, pork and charcuterie compared to lowering it, while a relative majority preferred to lower the tax on fish, chicken, vegetarian meat substitutes, eggs and dairy, compared to increasing it.

4.3. Individual-level factors

4.3.1. Exploratory analysis

Lastly, we explored whether the attitudes of citizens and politicians toward tax and revenue uses could be similarly explained by demographic and individual characteristics. Ten multiple regressions (one per tax proposal and group (citizen and politician)) were conducted, regressing the following predictors on acceptability: gender, age, education, viewing climate change as an important societal issue, viewing public health as an important societal issue, and meat consumption. For the citizen sample, we further assessed the effects of income, rural/urban residence, social trust, political trust, and political ideology in a second model (these variables could not be obtained for the politician sample).

Demographic and individual-level factors predicted acceptability similarly for citizens and politicians (see Tables 9 and 10). A higher age predicted more negative attitudes toward all tax proposals, while being male predicted negative attitudes toward the two cost-neutral revenue uses as well as the one compensating the agricultural sector. Education did not affect the citizen's or politician's acceptability of either tax proposal. For both citizens and politicians, viewing climate change as an important societal issue as well as the amount of meat a person consumes were consistently the most important predictors of accepting a meat tax and its revenue uses. While viewing public health as an important societal issue was consistently positively related to acceptability for citizens, how politicians prioritized public health was not related to their attitudes toward the unspecified use or the broad VAT reduction.

For the citizen sample, living in more rural compared to urban areas was consistently negatively related to acceptability. The exception was the case of using revenue to support agriculture, where the effect of the residential area was no longer significant. Lower political trust consistently predicted more negative attitudes toward all tax proposals, with
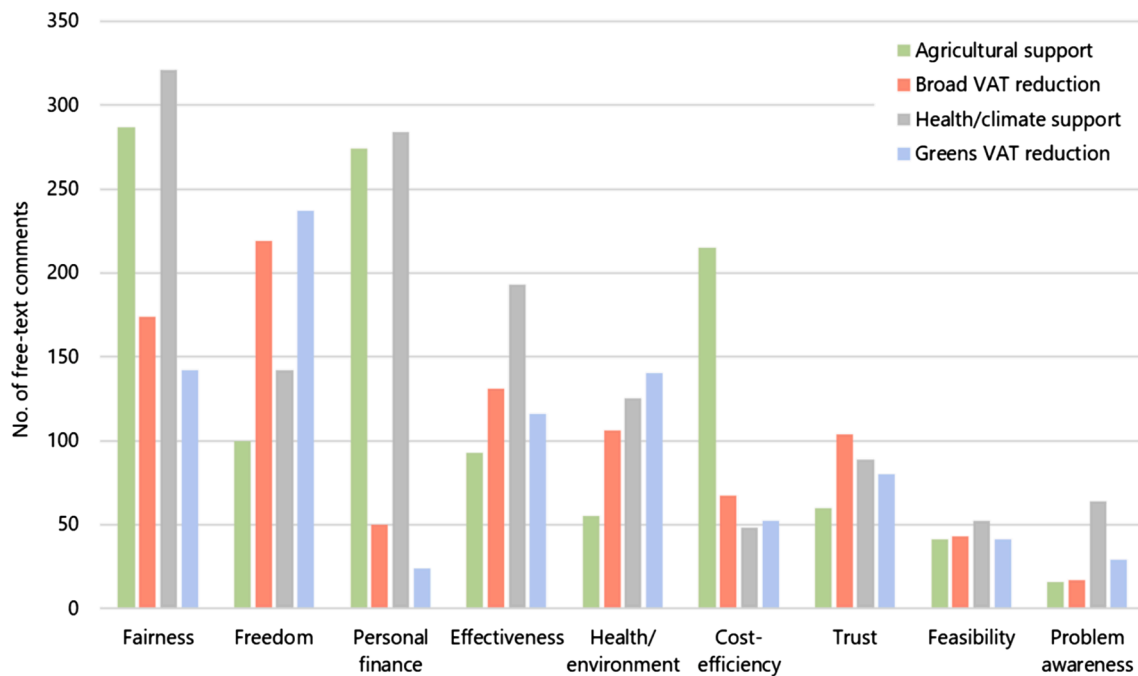
Fig. 3. Counts of negative free-text comments on tax proposals with different revenue uses.

Table 8
Citizens' preference for lowering, maintaining, and raising the tax rate for different food products.

	Lower tax	Maintain tax	Higher tax	N
Sugar-sweetened beverages	3.8 %	22.8 %	73.4 %	2948
Candy, cookies and snacks	4.0 %	28.1 %	67.9 %	2946
Charcuterie	14.1 %	54.4 %	31.6 %	2951
Beef	16.4 %	52.8 %	30.8 %	2941
Pork	16.3 %	56.8 %	26.8 %	2954
Chicken	26.2 %	59.3 %	14.5 %	2950
Vegetarian meat substitutes	29.2 %	56.9 %	14 %	2945
Fish and seafood	38.8 %	52.2 %	8.9 %	2950
Dairy and eggs	40.9 %	54.7 %	4.4 %	2944
Organic food	57.4 %	37.7 %	4.9 %	2938
Legumes	57.0 %	39.7 %	3.3 %	2949
Keyhole labeled food	58.2 %	39.6 %	2.2 %	2947
Fruit and vegetables	76.3 %	22.9 %	0.8 %	2948

Note: The keyhole label is a voluntary Nordic food label that considers the fiber, wholegrain, salt, sugar, and fat content of food products.

slightly larger effects for the unspecified use and support of public health/climate. Identifying ideologically as more right-wing was consistently negatively related to the acceptability of all tax proposals,

with a relatively smaller effect for agricultural support. Lastly, income and social trust generally had little impact on the acceptability of most tax proposals.

5. Discussion

Our results on individual factors suggest that younger people living in more urban areas, who have greater trust in politicians, who are ideologically left-wing, who view climate change (and, to a lesser extent, public health) as a priority societal issue and who eat little meat are consistently associated with more positive policy attitudes across the policy proposals. This is in line with previous research into meat tax acceptability (Grimsrud et al., 2020; Khan et al., 2022; Pechey et al., 2022). Being female meant increased support for the two cost-neutral proposals as well as the proposal supporting agriculture.

While the effects of gender, age and education predicted support for policy proposals in the same way for politicians and citizens, the attitudes of politicians toward the tax proposals were overall more negative than those of citizens. However, the fact that the politician sample comprised a larger share of men and people of higher ages than the citizen sample, accounts for around half to two-thirds of the mean differences in tax proposal acceptability between politicians and citizens.

Table 9
Five multiple regressions on acceptability, one per tax proposal for the politician sample.

	Unspecified use (N = 1199)		Health/climate support (N = 1194)		Agricultural support (N = 1194)		Broad VAT reduction (N = 1194)		Greens VAT reduction (N = 1194)	
	b (SE)	SPC	b (SE)	SPC	b (SE)	SPC	b (SE)	SPC	b (SE)	SPC
Constant	2.06 (0.38)***		1.52 (0.36)***		1.83 (0.37)***		2.60 (0.42)***		2.54 (0.42)***	
Female gender	0.12 (0.10)	0.03	0.04 (0.10)	0.01	0.29 (0.10)**	0.08	0.32 (0.11)**	0.07	0.39 (0.11)***	0.09
Age	−0.20 (0.04)***	0.13	−0.07 (0.03)*	0.05	−0.07 (0.04)*	0.05	−0.13 (0.04)**	0.08	−0.15 (0.04)***	0.09
Education	0.05 (0.03)	0.05	0.00 (0.02)	0.00	−0.02 (0.03)	0.02	−0.02 (0.03)	0.02	−0.01 (0.03)	0.01
Climate importance	0.30 (0.02)***	0.34	0.27 (0.02)***	0.34	0.20 (0.02)***	0.26	0.27 (0.02)***	0.30	0.29 (0.02)***	0.30
Public health importance	0.04 (0.03)	0.03	0.08 (0.03)**	0.07	0.08 (0.03)**	0.08	0.05 (0.03)	0.04	0.12 (0.03)***	0.09
Meat consumption	−0.45 (0.04)***	0.25	−0.32 (0.04)***	0.20	−0.26 (0.04)***	0.16	−0.35 (0.05)***	0.19	−0.45 (0.05)***	0.23
	Adj. R²: 0.32		*Adj. R²*: 0.27		*Adj. R²*: 0.19		*Adj. R²*: 0.22		*Adj. R²*: 0.29	

Note: Significance levels: *** = p < 0.001, ** = p < 0.01, * = p < 0.05.
SPC stands for semi-partial correlation.

Table 10

Five multiple regressions on acceptability, one per tax proposal for the citizen sample.

	Unspecified use (N = 2967)		Health/climate support (N = 2910)		Agricultural support (N = 2909)		Broad VAT reduction (N = 2907)		Greens VAT reduction (N = 2922)	
Model 1	b (SE)	SPC	b (SE)	SPC	b (SE)	SPC	b (SE)	SPC	b (SE)	SPC
Constant	2.31 (0.22)***		1.57 (0.21)***		2.04 (0.23)***		2.51 (0.24)***		2.36 (0.24)***	
Female gender	0.01 (0.06)	0.00	0.02 (0.06)	0.01	0.24 (0.07)***	0.06	0.31 (0.07)***	0.07	0.40 (0.07)***	0.09
Age	−0.17 (0.02)***	0.13	−0.10 (0.02)***	0.09	−0.13 (0.02)***	0.10	−0.16 (0.02)***	0.12	−0.20 (0.02)***	0.14
Education	0.09 (0.02)***	0.08	0.02 (0.02)	0.02	0.01 (0.02)	0.01	−0.03 (0.02)	0.03	−0.01 (0.02)	0.00
Climate importance	0.29 (0.01)***	0.34	0.27 (0.01)***	0.35	0.21 (0.01)***	0.27	0.23 (0.01)***	0.28	0.30 (0.01)***	0.34
Public health importance	0.04 (0.02)**	0.04	0.08 (0.02)***	0.08	0.06 (0.02)**	0.05	0.11 (0.02)***	0.10	0.14 (0.02)***	0.11
Meat consumption	−0.52 (0.03)***	0.29	−0.30 (0.03)***	0.18	−0.22 (0.03)***	0.13	−0.26 (0.03)***	0.15	−0.37 (0.03)***	0.19
	Adj. R²: 0.38		*Adj. R²*: 0.31		*Adj. R²*: 0.19		*Adj. R²*: 0.23		*Adj. R²*: 0.35	
Model 2										
Constant	4.19 (0.32)***		3.40 (0.31)***		2.79 (0.34)***		4.16 (0.36)***		4.31 (0.35)***	
Female gender	−0.07 (0.06)	0.02	−0.07 (0.06)	0.02	0.19 (0.07)**	0.05	0.23 (0.07)**	0.05	0.31 (0.07)***	0.07
Age	−0.15 (0.02)***	0.11	−0.09 (0.02)***	0.07	−0.13 (0.02)***	0.10	−0.14 (0.02)***	0.11	−0.18 (0.02)***	0.12
Education	0.07 (0.02)***	0.06	0.01 (0.02)	0.01	0.01 (0.02)	0.01	−0.04 (0.02)*	0.03	−0.02 (0.02)	0.02
Climate importance	0.21 (0.01)***	0.22	0.21 (0.01)***	0.24	0.18 (0.01)***	0.20	0.17 (0.02)***	0.18	0.23 (0.02)***	0.23
Public health importance	0.04 (0.02)*	0.03	0.07 (0.02)***	0.07	0.05 (0.02)**	0.05	0.11 (0.02)***	0.09	0.13 (0.02)***	0.10
Meat consumption	−0.49 (0.03)***	0.27	−0.27 (0.03)***	0.16	−0.21 (0.03)***	0.13	−0.23 (0.03)***	0.13	−0.33 (0.03)***	0.17
Income	0.02 (0.01)*	0.03	−0.01 (0.01)	0.02	−0.01 (0.01)	0.02	0.01 (0.01)	0.01	0.02 (0.01)	0.02
Degree of ruralism	−0.04 (0.02)**	0.04	−0.04 (0.01)**	0.04	0.02 (0.02)	0.02	−0.04 (0.02)	0.04	−0.05 (0.02)**	0.05
Social trust	0.02 (0.02)	0.02	0.01 (0.02)	0.01	0.04 (0.02)*	0.03	0.00 (0.02)	0.00	−0.00 (0.02)	0.00
Political trust	−0.21 (0.04)***	0.07	−0.21 (0.04)***	0.08	−0.14 (0.05)**	0.05	−0.15 (0.05)**	0.05	−0.16 (0.05)***	0.05
Political ideology	−0.17 (0.02)***	0.18	−0.13 (0.01)***	0.15	−0.06 (0.02)***	0.07	−0.15 (0.02)***	0.15	−0.18 (0.02)***	0.18
	Adj. R²: 0.42		*Adj. R²*: 0.34		*Adj. R²*: 0.20		*Adj. R²*: 0.26		*Adj. R²*: 0.39	

Note: Significance levels: *** = $p < 0.001$, ** = $p < 0.01$, * = $p < 0.05$.
SPC stands for semi-partial correlation.

While previous reports have suggested that Swedish politicians are negative towards using price incentives to steer food consumption (Reformaten, 2024), our results show that their attitudes are relatively similar to those of the public. Despite politicians stating being hesitant toward food taxes due to the increased administrative burden, politicians became more positive toward the tax when revenues are used to lower other food prices, which would further increase the administrative burden. This suggests that the perceived negative effect of increased administrative burden might not outweigh the potential of gaining voter support or the effect of politicians' individual preferences. In line with previous research on policy opinions in other sectors, it seems as though the attitudes of Swedish politicians are fairly well aligned with the attitudes of the Swedish public (Wallner, 2008; Burstein 2003). Whether this is due to a political responsiveness to public opinion or to politicians responding as private individuals with similar preferences as the general public is less clear. However, given that demographic and individual level variables predict attitudes similarly in terms of strength and direction for citizens and politicians, this might rather point to politicians holding individual preferences in line with the general public. For research on policy acceptability, this suggests that as long as politicians are representative of the public in terms of demographic factors, we might assume that research on public acceptability will also be indicative of how politicians will respond.

In line with some previous research (Fesenfeld et al., 2021; Pechey et al., 2022), our analyses of different framings of the tax aim did not find a strong or consistent impact on acceptability. We reasoned that a combined frame could be expected to yield greater acceptability because it possibly targets two different population segments (those prioritizing public health vs climate issues). We found that the combined public health and climate frame did yield significantly greater acceptability compared to the public health frame for citizens. However, there was no significant difference between the combined frame and the climate frame, nor did the support among politicians differ between the three frames.

Policy design and framing are concepts that can include many different aspects, such as price levels, revenue use, instrument type, and justification, social norm reference, scientific consensus, respectively. Framing the motivation behind, or different benefits associated with a policy, does not appear to substantially or consistently shift policy support (Fesenfeld et al., 2021; Fesenfeld & Rinscheid, 2021), and researchers have highlighted that there is little guiding theory or evidence as to which frames resonate with which individuals (Druckman & McGrath, 2019). For example, while one study indicates that an animal welfare framing does not substantially shift support for meat policies in Germany (Fesenfeld et al., 2021), another highlights the positive effect of an animal welfare justification over a climate justification on policy support (Perino & Schwickert, 2023). However, we would argue that the latter does not reflect a pure framing effect, as the animal welfare and climate tax would also lead to different tax shifts for different meat products. While not all design elements will affect policy support equally strong or at all (e.g., Fesenfeld et al., 2022), there is research suggesting that the effects of policy design, for example in the form of varied costs or effectiveness, tends to have larger impacts on policy support than framing and that framing may primarily impact support by interacting with certain design elements (Stokes & Warshaw, 2017; Fesenfeld et al., 2022). While the previously mentioned research on framing and design has investigated between-subjects effects of both framing and design, in this study we compared the between-subjects effects of framing with the within-subjects effects of design. This design choice may to an extent have inflated the effect sizes of design relative to those of framing. Despite this, our results are in line with those of previous studies showing that policy design may have a larger impact on support than framing.

From the multiple regressions, we saw that believing that public health is an important societal issue did not predict acceptability as strongly as viewing climate change as an important issue. This was the case for both citizens and politicians. This could reflect that meat consumption is viewed as a behavior whose negative impact is mainly on GHG emissions and not public health. This is partly supported by the results of Röös et al. (2022), who showed that Swedes believe red meat

consumption affects both climate and public health but have a stronger belief in its climatic effect. Based on how citizens indicated their preference for altering current tax levels on different foods, they seemed to strongly prefer taxing foods with clear negative effects on health (such as sugar-sweetened beverages) rather than the climate. One interpretation of these results is that people do indeed prefer to tax unhealthy foods and subsidize healthy foods (as indicated by the preferred tax levels in Table 8) but that they do not believe high consumption of red and processed meat has a negative impact on public health. Thus, whether the food being taxed is perceived as having a negative health impact may be more important for acceptability than if the tax is framed as having a public health aim.

Although citizens held more positive attitudes toward four of the five tax proposals compared to politicians, citizens and politicians tended to rank the favorability of proposals similarly. Both groups were most positive toward the two cost-neutral proposals, followed by using revenues for agricultural support. Some researchers have argued that specifying revenue use might increase tax acceptability because it reduces the need for trust in politicians due to increased transparency (e. g., Barry et al., 2023). While the effect of political trust is somewhat smaller for three of the four specified revenue uses compared to the unspecified alternative, this does not necessarily equate to strong support for the hypothesis that the overall increase in acceptability when specifying revenue use is due to increased trust in politicians. Politicians, whose political trust is presumably irrelevant to their policy attitudes, also appear to have more positive attitudes toward the specified revenue uses compared to the unspecified alternative. Their preference for specified revenue uses might be due to other factors than those driving citizens' attitudes, such as their expectations of citizens' preferences. However, it is perhaps more likely that both citizens' and politicians' attitudes toward specifying revenue use are driven by mechanisms specific to each type of revenue use.

Using tax revenue for environmental projects to increase policy effectiveness has proven to be one of the most acceptable ways of using tax revenues (Maestre-Andrés et al., 2019; Saelen & Kallbekken, 2011; Matti et al., 2022, Valencia et al., 2023). However, in the food domain, using revenues to facilitate cost-neutrality for consumers appears to be the superior strategy for increasing acceptability. This could be either a domain-specific result or a symptom of the (at the time of the survey period) high food prices in Sweden. Since our results are in line with Grimserud et al. (2019), whose results were not influenced by a period of unusually high food prices, the domain-specific explanation may be more likely, e.g. that the basic needs connotation of food implies that private costs are viewed as more important than for other goods.

Previous research shows mixed results regarding the acceptability of other forms of cost-neutral revenue uses, such as lump-sum equal redistribution. Reviews have found that the lump-sum method is not very popular (Valencia et al., 2023), but that the low preference for it might be due to misperceptions of the negative effects on one's own economy (Douenne & Fabre, 2022). Correcting these misperceptions can enhance a preference (Carattini et al., 2017). Using revenues for directed cash transfers specifically to compensate low-income groups can also increase acceptability (Maestre-Andrés et al., 2019; 2021; Valencia et al., 2023). While the preference for the two VAT reduction uses may be driven by a belief that it will be cost-neutral specifically for low-income consumers, the free-text analysis suggests that it is the cost-neutrality itself that causes the positive attitudes, as more respondents commented on the unfairness of the proposals as opposed to their negative financial effects. Furthermore, citizens' comments seemed to indicate that the two cost-neutral uses restricted personal choice to a greater degree than the other two uses, indicating that perceived infringement on autonomy was not the most important factor driving their attitudes toward the meat tax.

6. Limitations

While the overall results are in line with previous research into the support for environmental policies, the scope of the research was limited to one country – Sweden. At the time of the survey, inflation in Sweden was high and the preceding months had been characterized by high food prices. While we do not believe that this would have affected the general results of the study (such as preference for revenue uses), the absolute acceptability ratings of the tax proposals should be interpreted with this limitation in mind. Moreover, Sweden is a country with a high level of meat consumption. A meat tax might be more acceptable in countries with lower consumption, given that low meat consumption is a strong predictor of positive policy attitudes. However, Sweden also has a long experience of environmental taxation and a relatively high degree of political trust (Standard Eurobarometer, 2019). Furthermore, Sweden has historically applied the full VAT rate on food, but since 1996, it has been reduced to half of the standard rate. This history of value-added tax on foods could foster more positive attitudes toward additional food price interventions and reduce the administrative burden of adjusting food taxes. These results might be especially relevant for other countries with reduced VAT rates for food, such as Germany and France. Acceptance levels might on the other hand be higher in countries that already have lower VAT for some types of food but not for others, such as Italy, Spain, and the UK (OECD, 2024). Conversely, support might be lower in countries where there is no VAT on groceries, such as most states in the United States. Additionally, absolute support levels might be lower in countries with high levels of red meat production.

Both the citizen and politician samples were more educated compared to the Swedish general population of citizens and politicians (see Table 1). However, as education had no systematic effects on acceptability, this over-representation may not have majorly impacted the results. Furthermore, the citizen sample was slightly older than the overall Swedish population. A higher age did have a negative effect on support for the tax proposals. This suggests that population-wide attitudes might be slightly more positive than those of our sample.

7. Policy implications

In the food domain, both citizens and politicians seem to prioritize not burdening consumers financially. These results indicate that when implementing taxes, using tax revenues to simultaneously reduce the price of other (preferentially healthy or low-emission) foods might make a tax proposal more acceptable. In this survey, the two VAT reduction revenue uses were structured so as not to raise the average cost of a grocery bag. According to Swedish price levels and price elasticities, increasing the price of red meat by 20 % would require setting the VAT rate for vegetables and fruits at 0 % to maintain cost neutrality (Larsson et al., 2024). Furthermore, people appear to have a strong preference for taxing foods they perceive to be unhealthy. A meat tax might therefore become more feasible if policymakers focus on pre-emptive and clear communication of the health risks associated with a high consumption of red and processed meat.

Previous research has shown that using revenues for multiple purposes, such as compensating low-income households and funding environmental projects, tends to gain relatively high support (Maestre-Andrés et al., 2021). This approach could address different population segments with varying priorities. Analyzing regressions for citizen acceptability, political ideology emerged as one of the most significant predictors. Since political ideology was not considered in the politician survey, we examined the acceptability of revenue uses by party vote (for citizens) or affiliation (for politicians) (see Figure S2). The results indicate that reductions in VAT were most favored across political parties. However, parties with right-wing ideologies, who generally view all interventions more negatively, found agricultural support to be the third most acceptable use of revenue. In contrast, parties with left-wing ideologies, typically more favorable towards interventions, rated it as the

least acceptable. Employing a diverse mix of revenue uses to achieve cost-neutrality for consumers, increase the effectiveness of the tax intervention and also support the agricultural industry could be a potential strategy to secure support across party lines.

Previous research has suggested that environmental taxes may be more acceptable when bundled in larger policy packages (Fesenfeld et al., 2020). While discussions on policy packaging typically include a larger array of policies, here we investigate the influence of one additional policy (the use of revenue) on a tax proposal. This approach allows us to gain a better understanding of why an additional policy may affect tax attitudes, and results suggest that policy packages may, in part, become more acceptable when policies mitigate negative effects on personal finance and are introduced in the same domain (in this case food). A policy package that steers food consumption, not just by taxing red meat but also foods with more apparent negative health effects (such as sugar-sweetened beverages) might further be more acceptable than a meat tax introduced on its own, given that people seem more favorable to health-related food taxes.

In similar vein, research into policy sequencing (i.e., the order in which policies are implemented) suggests that having positive perceptions (due to, say, the perceived benefits of previously implemented policies within the same domain) is related to support for increased tax rates (Montfort et al., 2023). Support for implementing a tax on red and processed meat might be greater if other more popular policies have already been implemented. For example, our results on preference for tax rates (see Table 8) suggest there could be majority support for increasing the tax rate on candy, snacks and sugar-sweetened beverages and for reducing the tax rate on fruit, legumes and vegetables, as well as health-labelled or organic food. Implementing either of these policies first might facilitate the introduction of less popular policies in the future.

CRediT authorship contribution statement

Emma Ejelöv: Writing – review & editing, Writing – original draft, Formal analysis, Conceptualization. **Jonas Nässén:** Writing – review & editing, Funding acquisition, Formal analysis, Conceptualization. **Simon Matti:** Writing – review & editing, Funding acquisition, Conceptualization. **Liselott Schäfer Elinder:** Writing – review & editing, Funding acquisition, Conceptualization. **Jörgen Larsson:** Writing – review & editing, Funding acquisition, Conceptualization.

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Supplementary material

Supplementary data to this article can be found online at https://doi.org/10.1016/j.foodpol.2024.102772.

Data availability

Data will be made available on request.

References

Ammann, J., Arbenz, A., Mack, G., Nemecek, T., El Benni, N., 2023. A review on policy instruments for sustainable food consumption. Sustain. Prod. Consumpt.

Baranzini, A., Carattini, S., 2017. Effectiveness, earmarking and labeling: testing the acceptability of carbon taxes with survey data. Environ. Econ. Policy Stud. 19, 197–227.
Barry, L.E., Kee, F., Woodside, J., Cawley, J., Doherty, E., Clarke, M., O'Neill, C., 2023. An umbrella review of the acceptability of fiscal and pricing policies to reduce diet-related Noncommunicable disease. Nutr. Rev. 81 (10), 1351–1372.
Bendz, A., Bäckstedt, F., Harring, N., Persson, U.M., 2023. Why do people accept or reject climate policies targeting food consumption? Unpacking justifications in the public debate in online social forums. Food Policy 121, 102544.
Bergquist, M., Nilsson, A., Harring, N., Jagers, S.C., 2022. Meta-analyses of fifteen determinants of public opinion about climate change taxes and laws. Nat. Clim. Chang. 12 (3), 235–240.
Blomhoff, R., Andersen, R., Arnesen, E.K., Christensen, J.J., Eneroth, H., Erkkola, M., Gudanaviciene, I., Halldorsson, T.I., Høyer-Lund, A., Lemming, E.W., Meltzer, H.M., Pitsi, T., Schwab, U., Siksna, I., Thorsdottir, I. and Trolle, E. Nordic Nutrition Recommendations 2023. Copenhagen: Nordic Council of Ministers, 2023.
Broeks, M.J., Biesbroek, S., Over, E.A., Van Gils, P.F., Toxopeus, I., Beukers, M.H., Temme, E.H., 2020. A social cost-benefit analysis of meat taxation and a fruit and vegetables subsidy for a healthy and sustainable food consumption in the Netherlands. BMC Public Health 20 (1), 1–12.
Bullock, J.G., 2011. Elite influence on public opinion in an informed electorate. Am. Polit. Sci. Rev. 105 (3), 496–515.
Burstein, P., 2003. The impact of public opinion on public policy: A review and an agenda. Polit. Res. q. 56 (1), 29–40.
Butler, C., 2023. Do governments always take unpopular decisions knowingly? How perceptual inaccuracy affects policy decisions. Representation 1–18.
Carattini, S., Baranzini, A., Thalmann, P., Varone, F., Vöhringer, F., 2017. Green taxes in a post-Paris world: are millions of nays inevitable? Environ. Resour. Econ. 68, 97–128.
Cherry, T.L., Kallbekken, S., Kroll, S., 2012. The acceptability of efficiency-enhancing environmental taxes, subsidies and regulation: An experimental investigation. Environ Sci Policy 16, 90–96.
Cohen, G.L., 2003. Party over policy: The dominating impact of group influence on political beliefs. J. Pers. Soc. Psychol. 85 (5), 808.
Dasandi, N., Graham, H., Hudson, D., Jankin, S., vanHeerde-Hudson, J., Watts, N., 2022. Positive, global, and health or environment framing bolsters public support for climate policies. Commun. Earth Environ. 3 (1), 239.
Diepeveen, S., Ling, T., Suhrcke, M., Roland, M., Marteau, T.M., 2013. Public acceptability of government intervention to change health-related behaviours: a systematic review and narrative synthesis. BMC Public Health 13 (1), 1–11.
Douenne, T., Fabre, A., 2022. Yellow vests, pessimistic beliefs, and carbon tax aversion. Am. Econ. J. Econ. Pol. 14 (1), 81–110.
Drews, S., Van den Bergh, J.C., 2016. What explains public support for climate policies? A review of empirical and experimental studies. Clim. Pol. 16 (7), 855–876.
Druckman, J.N., McGrath, M.C., 2019. The evidence for motivated reasoning in climate change preference formation. Nat. Clim. Chang. 9 (2), 111–119.
Ejelöv, E., Nilsson, A., 2020. Individual factors influencing acceptability for environmental policies: a review and research agenda. Sustainability 12 (6), 2404.
Erikson, R.S., MacKuen, M., Stimson, J.A., 2002. The Macro Polity. Cambridge University Press, Cambridge, U.K.
Eriksson, L., Garvill, J., Nordlund, A.M., 2008. Acceptability of single and combined transport policy measures: The importance of environmental and policy specific beliefs. Transp. Res. A Policy Pract. 42 (8), 1117–1128.
Esaiasson, P., Wlezien, C., 2017. Advances in the study of democratic responsiveness: an introduction. Comp. Pol. Stud. 50, 699–710.
Standard Eurobarometer 90: Standard Eurobarometer 90 (v1.00). (2019). . European Commission, Directorate-General for Communication. http://data.europa.eu/88u/dataset/S2215_90_3_STD90_ENG.
Eurostat. (2024). Agricultural production - livestock and meat. . https://ec.europa.eu/eurostat/statistics-explained/index.php?oldid=427096.
Eykelenboom, M., Van Stralen, M.M., Olthof, M.R., Renders, C.M., Steenhuis, I.H., 2021. Public acceptability of a sugar-sweetened beverage tax and its associated factors in the Netherlands. Public Health Nutr. 24 (8), 2354–2364.
FAO. (2023a). Food Balances (2010-2021). Database updated October 27 2023. https://www.fao.org/faostat/en/#data/FBS.
FAO. (2023b). Pathways towards lower emissions – A global assessment of the greenhouse gas emissions and mitigation options from livestock agrifood systems. Rome. https://doi.org/10.4060/cc9029en.
Fesenfeld, L.P., Rinscheid, A., 2021. Emphasizing urgency of climate change is insufficient to increase policy support. One Earth 4 (3), 411–424.
Fesenfeld, L., Rudolph, L., Bernauer, T., 2022. Policy framing, design and feedback can increase public support for costly food waste regulation. Nat. Food 3 (3), 227–235.
Fesenfeld, L.P., Wicki, M., Sun, Y., Bernauer, T., 2020. Policy packaging can make food system transformation feasible. Nat. Food 1 (3), 173–182.
Fesenfeld, L.P., Sun, Y., Wicki, M., Bernauer, T., 2021. The role and limits of strategic framing for promoting sustainable consumption and policy. Glob. Environ. Chang. 68, 102266.
Glynn, C.J., Herbst, S., O'Keefe, G., Shapiro, R., Lindeman, M., 1999. Public Opinion. Westview Press, Boulder.
Grimsrud, K.M., Lindhjem, H., Sem, I.V., Rosendahl, K.E., 2020. Public acceptance and willingness to pay cost-effective taxes on red meat and city traffic in Norway. J. Environ. Econ. Policy 9 (3), 251–268.
Heidenblad, D.L., 2021. Den gröna vändningen: En ny kunskapshistoria om miljöfrågornas genombrott under efterkrigstiden. Nordic Academic Press.

Huber, R.A., Wicki, M.L., Bernauer, T., 2019. Public support for environmental policy depends on beliefs concerning effectiveness, intrusiveness, and fairness. Environmental Politics.

Jakobson, H. (2018, February 24). Köttskatt splittrar regeringen inför valet. Expressen. https://www.expressen.se/nyheter/klimat/kottskatt-splittrar-partierna-i-riksdagen/.

Kallbekken, S., Kroll, S., Cherry, T.L., 2011. Do you not like Pigou, or do you not understand him? Tax aversion and revenue recycling in the lab. J. Environ. Econ. Manag. 62, 53–64. https://doi.org/10.1016/j.jeem.2010.10.006.

Kalmström, P., Paulsson, J., 2017. June 26). Försvåra köttätandet – rädda vårt jordklot. Aftonbladet. https://www.aftonbladet.se/debatt/a/vqeEp/forsvara-kottatandet-radda-vart-jordklot.

Khan, J., Emilsson, K., Fritz, M., Koch, M., Hildingsson, R., Johansson, H., 2023. Ecological ceiling and social floor: public support for eco-social policies in Sweden. Sustain. Sci. 18 (3), 1519–1532.

Klenert, D., Mattauch, L., Combet, E., Edenhofer, O., Hepburn, C., Rafaty, R., Stern, N., 2018. Making carbon pricing work for citizens. Nat. Clim. Chang. 8 (8), 669–677.

Kullgren, P., 2023. June 17). Sverige behöver öka köttproduktionen – inte minska den. Aftonbladet. https://www.aftonbladet.se/debatt/a/WRWQVG/kullgren-sverige-behover-oka-kottproduktionen.

Larsson, J., Månsson, E., Röös, E., Säll, S., Patterson, E., Schäfer Elinder, L., Nässén, J., Ejelöv, E. (2024). Taxing for a Tastier Tomorrow: Integrated Health and Environmental Taxes for a Sustainable and Equitable Food System. [Manuscript submitted for publication].

Lavin, R., Timpson, H., 2013. Exploring the acceptability of a tax on sugar-sweetened beverages: brief evidence review. Centre for Public Health Liverpool John Moores University, Liverpool.

Livsmedelsverket. (2012). Riksmaten vuxna - 2010-2011, Livsmedels- och näringsintag bland vuxna i Sverige. Uppsala: Livsmedelsverket.

Lundqvist, L.J., 2004. Sweden and ecological governance: Straddling the fence. Manchester University Press.

Maestre-Andrés, S., Drews, S., van den Bergh, J., 2019. Perceived fairness and public acceptability of carbon pricing: a review of the literature. Clim. Pol. 19 (9), 1186–1204.

Maestre-Andrés, S., Drews, S., Savin, I., van den Bergh, J., 2021. Carbon tax acceptability with information provision and mixed revenue uses. Nat. Commun. 12 (1), 7017.

Martinsson, J., 2023. Stora svängningar i den politiska dagordningen valåret 2022. Ovisshetens Tid 95–108.

Matti, S., Nässén, J., Larsson, J., 2022. Are fee-and-dividend schemes the savior of environmental taxation? Analyses of how different revenue use alternatives affect public support for Sweden's air passenger tax. Environ Sci Policy 132, 181–189.

Meinilä, J., & Virtanen, J. K. (2024). Meat and meat products–a scoping review for Nordic Nutrition Recommendations 2023. Food & Nutrition Research.

Montfort, S., Fesenfeld, L., Stadelmann-Steffen, I., Ingold, K., 2023. Policy sequencing can increase public support for ambitious climate policy. Policy Soc. 42 (4), 454–477.

Motion 2018/19:2299. Ny skatt för att främja minimal antibiotikaanvändning i djuruppfödningen inom EU och globalt. https://www.riksdagen.se/sv/dokument-och-lagar/dokument/motion/ny-skatt-for-att-framja-minimal_H6022299/.

Motion 2022/23:1127. Producentavgift på andelen socker i sockersötade drycker. https://www.riksdagen.se/sv/dokument-och-lagar/dokument/motion/producentavgift-pa-andelen-socker-i-sockersotade_ha021127/.

Naturvårdsverket. (2023). National Inventory Report. Sweden 2023 Greenhouse Gas Emission Inventories 1990-2021. Naturvårdsverket.

Nordic Council of Ministers. (2024). Policy tools for sustainable and healthy eating: Enabling a food transition in the Nordic countries. Nord 2024:007. https://doi.org/10.6027/nord2024-007.

OECD. (2024). https://data-explorer.oecd.org/?fs[0]=Topic%2C0%7CTaxation%23TAX%23&pg=0&fc=Topic&bp=true&snb=183.

Pechey, R., Reynolds, J.P., Cook, B., Marteau, T.M., Jebb, S.A., 2022. Acceptability of policies to reduce consumption of red and processed meat: A population-based survey experiment. J. Environ. Psychol. 81, 101817.

Perino, G., Schwickert, H., 2023. Animal welfare is a stronger determinant of public support for meat taxation than climate change mitigation in Germany. Nat. Food 4 (2), 160–169.

Petrovic, N., Madrigano, J., Zaval, L., 2014. Motivating mitigation: when health matters more than climate change. Clim. Change 126, 245–254.

Public Health Agency of Sweden. (2024). En hållbar och hälsosam livsmedelskonsumtion – Återredovisning av regeringsuppdrag. Report no. 24004.

Purtle, J., Stadnick, N.A., Wynecoop, M., Walker, S.C., Bruns, E.J., Aarons, G.A., 2024. Acceptability and feasibility of policy implementation strategies for taxes earmarked for behavioral health services. Front. Health Serv. 4, 1304049.

Reformaten. (2024). Matbarometern 4.0. Anta uppdraget. https://reformaten.com/wp-content/uploads/2024/03/Matbarometern-4.0-digitalt-uppslag.pdf.

Regulation (EU) 2023/857 of the European Parliament and of the Council. http://data.europa.eu/eli/reg/2023/857/oj.

Reynolds, J.P., Archer, S., Pilling, M., Kenny, M., Hollands, G.J., Marteau, T.M., 2019. Public acceptability of nudging and taxing to reduce consumption of alcohol, tobacco, and food: A population-based survey experiment. Soc. Sci. Med. 236, 112395.

Ritchie, H., Rosado, P., Roser, M., 2024. Meat and dairy production. Our world in data.

Röös, E., de Groote, A., Stephan, A., 2022. Meat tastes good, legumes are healthy and meat substitutes are still strange - The practice of protein consumption among Swedish consumers. Appetite 174, 106002.

Rosenfeld, D.L., Tomiyama, A.J., 2021. Gender differences in meat consumption and openness to vegetarianism. Appetite 166, 105475.

Sælen, H., Kallbekken, S., 2011. A choice experiment on fuel taxation and earmarking in Norway. Ecol. Econ. 70 (11), 2181–2190.

Salmon, P., 1993. Unpopular policies and the theory of representative democracy. In: Preferences and Democracy: Villa Colombella Papers. Springer, Netherlands, Dordrecht, pp. 13–39.

Santoro, L.R., Assaf, E., Bond, R.M., Cranmer, S.J., Kaizar, E.E., Sivakoff, D.J., 2021. Exploring the direct and indirect effects of elite influence on public opinion. PLoS One 16 (11), e0257335.

SCB. (2023). Förtroendevalda i kommuner och regioner 2023. Demokratistatistik 2024: 1.

Schielzeth, H., Dingemanse, N.J., Nakagawa, S., Westneat, D.F., Allegue, H., Teplitsky, C., Araya-Ajoy, Y.G., 2020. Robustness of linear mixed-effects models to violations of distributional assumptions. Methods Ecol. Evol. 11 (9), 1141–1152.

Severson, A.W., Coleman, E.A., 2015. Moral frames and climate change policy attitudes. Soc. Sci. q. 96 (5), 1277–1290.

Springmann, M., Mason-D'Croz, D., Robinson, S., Wiebe, K., Godfray, H.C.J., Rayner, M., Scarborough, P., 2017. Mitigation potential and global health impacts from emissions pricing of food commodities. Nat. Clim. Chang. 7 (1), 69–74.

Springmann, M., Clark, M., Mason-D'Croz, D., Wiebe, K., Bodirsky, B., Lassaletta, L., De Vries, W., 2018. Options for keeping the food system within environmental limits. Nature 562, 519–525.

Stokes, L.C., Warshaw, C., 2017. Renewable energy policy design and framing influence public support in the United States. Nat. Energy 2 (8), 1–6.

Valencia, F. M., Mohren, C., Ramakrishnan, A., Merchert, M., Minx, J., & Steckel, J. (2023). Public support for carbon pricing policies and different revenue recycling options: a systematic review and meta-analysis of the survey literature.

Vandenberghe, D., Albrecht, J., 2018. Tackling the chronic disease burden: are there co-benefits from climate policy measures? Eur. J. Health Econ. 19, 1259–1283.

Wallner, J., 2008. Legitimacy and Public Policy: Seeing Beyond Effectiveness, Efficiency, and Performance. Policy Stud. J. 36 (3), 421–443.

Walter, J.M., 2020. Comparing the effectiveness of market-based and choice-based environmental policy. J. Policy Model 42 (1), 173–191.

Wlezien, C., Soroka, S., 2012. Political Institutions and the Opinion-Policy Link. West Eur. Polit. 35, 1407–1432.

Zachrisson Wiberg, J. (2018, April 1). Politiker nobbar experters krav på köttskatt. SVTNyheter. https://www.svt.se/nyheter/inrikes/politiker-nobbar-experters-krav-pa-kottskatt.