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Citizen support for taxes and subsidies implemented to achieve more sustainable food consumption: the role of policy design and presentation.

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Citizen support for taxes and subsidies implemented to achieve more sustainable food consumption: the role of policy design and presentation

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Abstract

This study explores public support for policy packages including taxes and subsidies used either in isolation or in combination with the aim to reduce animal-based protein in diets. The purpose is to investigate if the support of these packages depends on how they are designed and presented. Previous studies reveal for instance that the design of a carbon tax e.g., in terms of tax level, revenue recycling options and geographical coverage significantly influence support. These results can be explained by concerns about living costs, competitiveness of the local economy, and effectiveness of the policy to reach its target. However, few studies (if any) have explored variations in public support for consumption taxes in the food domain. We have found no study investigating public support for subsidies implemented to promote sustainable diets. Our research aims to address this gap. We observe significant variation in support for different designs of taxes and subsidies in relation to how they might affect living costs. Other concerns, like the effectiveness of the policy package to reach its target, or whether a policy may hurt the national economy do not seem to be strong enough to influence support. It does seem however, that respondents tend to favor production-side subsidies over consumption-side subsidies, and that they generally dislike policies directed toward consumers, even in the form of subsidies. While our study contributes unique findings and insights that may extend beyond our Swedish sample, further investigations across domains as well as economic and political contexts are needed.

Keywords: Policy design, public acceptance, food policy, consumption taxes, subsidies, design and presentation

1. Introduction

Food production has a profound impact on the environment, contributing approximately 25% of global greenhouse gas emissions (IPCC, 2019) and utilizing 70% of the world's freshwater resources (Willet et al., 2019). Additionally, it plays a crucial role in biodiversity decline (IPBES, 2019). A more sustainable global food system necessitates improvements in food production, but also substantial shifts in dietary patterns (Willett et al., 2019).

Substituting animal-based food products with plant-based alternatives, especially in regions with high animal-based consumption, offers substantial environmental improvement potential (Aleksandrowicz et al., 2016; Poore and Nemecek, 2018). However, implementing such a shift on a larger scale is challenging due to people's reluctance to replace meat with other protein sources. (see e.g., Hartmann and Siegrist, 2017; Hoek et al., 2011; Hoek et al., 2013). This suggests that targeted policy interventions that can stimulate a behaviour change are needed.

However, politicians may hesitate to implement policy interventions if they anticipate significant public resistance (Bernauer 2013; Burstein, 2003; Drews and van den Bergh, 2015). One reason being their concern for re-election and aversion to unpopular policies (Hsu, 2011). Without public support, implementation of the intervention may be challenging, and people will be less likely to comply with it, leading to costs associated with monitoring and sanctioning (Gilabert, 2012). Thus, it is important to understand resistance, its main causes, and if something can be done from a policy design perspective to mitigate the resistance.

In this paper we want to explore public support for taxes and subsidies implemented to shift diets from being high in animal-based protein to becoming more plant-based. We want to understand if the support of these interventions depends on how the intervention is designed and presented.

Current policy instruments implemented with the aim to achieve a more sustainable food consumption (e.g. information provision, campaigns, education, and nudging) (Grundy et al., 2022; Kwasny et al., 2021; Ran et al., 2024) are generally accepted by citizens (Pechey et al., 2023). However, given rising meat consumption and projected demand for animal sourced foods (FAO, 2021), existing policies may fall short of targets. An academically accepted policy solution to this problem involves pricing the environmental damage caused by the production of animal-based production (Säll, 2018; Säll and Gren, 2015). The idea being to disincentivize production associated with large emissions, and therefore effectively and cost efficiently lower emissions.

However, citizens often resist costly policies and new taxes (Carattini et al., 2018). One may therefore guess that support for a tax on food products aiming to mitigate environmental damage is low, especially during economically challenging times (e.g., rising food prices, energy prices and interest rates). But few studies have investigated this empirically, and if something can be done from a policy design perspective to mitigate resistance and alleviate support.

Studies examining support for general carbon taxes reveal that the level of support can vary depending on the design of the intervention (Drews and van der Bergh, 2015, Carratini et al., 2018, Beiser-MacGrath and Bernauer, 2019). Evidence suggests that the perceived effectiveness of the proposed policy solutions play a crucial role (Bergquist et al., 2022; Maestre Andres et al., 2021). For instance, a tax with revenues allocated to further emission reduction measures, or implemented in several countries may garner higher support, as it may be perceived as more effective (Maestre-Aandres et al., 2021). A tax designed to compensate groups disproportionately affected by it may be considered fairer and gain more public backing (Bergquist et al., 2022). Concerns for increasing living

costs and budgetary challenges also influence support, favoring lower tax levels and compensatory measures. (Drews and van der Berg, 2016). However, few studies (if any) have explored how public support for environmental taxes specifically related to food products might vary with design (Perino and Schwickert 2023; Pechey et al., 2022, Fesenfelt et al., 2021). Our research aims to address this gap.

In this paper we also explore support for subsidies implemented for sustainable diets. Subsidies, from an economic perspective, encourage behavior that would be beneficial and welfare enhancing to society but that might not occur without financial incentives. A shift from environmentally impactful protein sources to more sustainable ones – reducing environmental impact from food consumption – could yield societal benefit. Yet, we know no study that has investigated public support for subsidies aimed at promoting sustainable diets.

Subsidies, together with other so called pull policies are in general more accepted by citizens (Jagers and Hammar, 2009; de Groot and Schuitema, 2012; Drews and van der Bergh, 2015) but is this true also for subsidies implemented with the aim to reduce animal-based protein consumption and increase plant-based protein consumption? This study will shed some light on this.

Considering taxes and subsidies together is interesting also from a government perspective and for a government in the need to balance the budget. Tax revenues could for instance be used to finance a subsidy, and vice versa. Our study examines how support for a policy package combining these pricing interventions varies with design and presentation. To our knowledge our study is the first to do so.

Our research focuses on Swedish citizens' support for policy packages related to dietary change. Sweden shares several food-related challenges with other high-income countries, where high levels of red meat consumption is one of these challenges. Red meat consumption in Sweden is approximately double the global average (FAO, 2023). Sweden serves as an interesting case study also for other reasons. For instance, it was among the first countries to incorporate environmental impacts into its national dietary guidelines (James-Martin et al., 2022). Moreover, the recently updated Nordic Nutrition Recommendations now considers both health and environmental factors (Blomhoff et al., 2023). For the first time, recommendations address what is beneficial not only for individual health but also for the planet. Following these processes, the role of different types of protein has been the subject for public and political debates (The Swedish Parliament, 2024) in Sweden. As a result, the Swedish public is relatively educated, or at least opinionated about the topic. While our study focuses on Sweden, its insights extend beyond Sweden and even the Nordic and Baltic regions. Other countries facing similar dietary challenges and policy agendas – such as those aligning with the Farm to Fork (European Commission, 2020) and Fit for 55 (European Commission, 2021) processes – can benefit from the insights of this study.

2. Methodological approach

We investigate support for different policy instruments based on survey responses from 2248 Swedish citizens. Participants were asked to rate their support for various policy interventions on a scale from 1 to 5, where 5 indicated strong support and 1 indicated no support at all. Participants could also choose to indicate having no opinion. The survey covered different proposed policy interventions, all motivated by the need to promote a more sustainable diet. After rating policy support, respondents answered questions related to background variables: age, gender, education, income, political leaning (on a left-to-right scale), and dietary patterns. Participants also provided answers about their attitudes regarding for example the role and responsibility of different food system actors, food price increases,

concern for the environment and climate change. For additional details, see the supplementary material.

2.1 Designing tax schemes

We investigate support for a tax on animal-based protein sources with a relatively large environmental impact and with high consumption rates in Sweden (i.e. beef, pork, chicken, and cheese). We focus on three key design features of the tax: level, coverage, and revenue usage, drawing mainly on insights from the literature on carbon taxes (Beiser-McGrath and Bernauer, 2019; Carattini et al., 2018; Jagers and Hammar, 2009). We also however, consulted experts and stakeholders in the Swedish food policy domain to guide our choices of tax design features to explore, aiming to explore relevant and realistic policy packages.

We test for three different tax levels (see Table 1). The highest level we propose is based on calculations and simulations made by Säll (2018) who used data on Swedish consumption rates and elasticities to calculate a tax level that would reflect the cost of the environmental damage (the negative externality) caused by the production of the consumption levels of the products (beef, pork, chicken and cheese). We let a medium level of the tax account for a bit more than half of the environmental damages and a low level of the tax account for a bit less than a third of the negative environmental impact (1 SEK corresponds to about 0.088 Euro and 0.094 US dollar). Individuals being concerned about the effect of the intervention on their household budget and economic situation should be sensitive to the level of the tax (Jagers and Hammar, 2009). We hypothesize that support for a tax on animal-based protein is higher for lower levels of the tax compared to higher levels (See Hypothesis 1 in Section 2.4).

Table 1: Tax levels used in Survey in SEK/Kg

	Low	Medium	High
<i>Price increase on pork</i>	2	5	7
<i>Price increase on beef</i>	11	21	32
<i>Price increase on chicken</i>	1	3	4
<i>Price increase on cheese</i>	5	9	14

Coverage – whether a tax is implemented nationally or across multiple countries - can play a role in shaping public support (Beiser-McGrath and Bernauer, 2019, Carattini et al., 2018). Implementing a tax in several countries enhances its effectiveness. A coordinated effort can ensure a more significant impact and mitigate so-called leakage. Leakage could in this case mean that consumers buy imported untaxed (and hence cheaper) products, implying that emissions are not reduced but rather ‘leaked’ elsewhere. Another concern of citizens could be that a tax could harm the local economy and local businesses competing with untaxed imported products and goods that are not exposed to the same tax burden (Carattini et al., 2018). We hypothesize that citizens recognize the value of cross-border collaboration and express higher support for a tax implemented in the European Union, compared to a tax implemented in Sweden only (See Hypothesis 2 in Section 2.4).

The third design feature we study is revenue usage. Studies investigating support for carbon taxes show that when revenues are explicitly mentioned – it can favor support for environmental taxes and that support can also vary depending on the type of usage (Beiser-McGrath and Bernauer, 2019). The existing body of literature regarding carbon taxation has predominantly examined three approaches to revenue recycling. These strategies encompass directing generated funds to support further initiatives

aimed at reducing emissions, redistributing the revenue to achieve a more equitable outcome, or lowering other taxes to maintain a balanced revenue scenario. The inclination towards earmarking revenue allocation is rooted in two key concerns held by voters. The initial concern revolves around a lack of confidence in government utilization of funds. Voters harbor skepticism towards politicians effectively utilizing the revenue unless it's explicitly designated for specific purposes or redistributed among the population (Beuermann and Santarius, 2006; Deroubaix and Lévèque, 2006; Hammar and Jagers, 2004). The second concern pertains to doubts about the efficacy of carbon taxes. Utilizing tax revenues to further enhance emissions reduction could provide some reassurance to voters regarding the tax's effectiveness and its capability to achieve environmental goals (Baranzini et al., 2017).

In this paper, we want to investigate if revenue recycling can enhance support also in the food domain. To fit the scope and context of our study, we ask about and compare support for tax proposals where 1) revenues are not mentioned with 2) revenues are mentioned and stated to be collected for any type of public spending. We also compare if support differs depending on revenue usage, more specifically if revenues are used for a 1) removal of the Value Added Tax (VAT) on plant-based protein, which might help to ensure a dietary shift or 2) used for any type of public spending. We hypothesize that support is higher when revenues are mentioned and specified to be used for a VAT removal compared to when not mentioned (see Hypothesis 3 in Section 2.4). We also hypothesize that support will be higher when revenues are used for a VAT removal compared to when used for non-specified governmental spending (See Hypothesis 4 in Section 2.4). As discussed, these hypotheses can be based on a concern about the tax's effectiveness to reach its target without complementary measures. However, the salience of the VAT removal in terms of affecting living costs positively could also motivate the hypotheses

2.2. Designing subsidies

Given the scarcity of evidence in existing literature regarding how public support for different designs of subsidies implemented for environmental purposes, we had to rely solely on the consultation of experts and stakeholders to guide our focus on relevant types of subsidies and subsidy designs. This consultation led us to investigate support for a subsidy in terms of a VAT removal on plant-based protein. This policy intervention has gained quite some attention recently in the academic, political, and private sector. One reason being its potential dual effect: to promote sustainable diets while alleviating households' financial burden during periods of high food prices economic distress. The design feature we investigate is the role of funding source for such a subsidy. We hypothesize that support for this subsidy is higher when the funding does not come from a tax on animal-based protein but rather comes from an unspecified budget post (due to concerns for increasing living costs) (see Hypothesis 5 in Section 2.4). We also investigate support for subsidies directed towards production. These subsidy types also align well with recent discussions in the Swedish food policy context, being regarded as a way to support Swedish farmers while increasing the availability of locally sourced plant-based protein. We hypothesize that support will be greater for a subsidy in the form of a VAT removal compared to a subsidy directed to the production side (also because of the potential effect on living costs) (See Hypothesis 6 in Section 2.4).

See Table 2 for specific design features of the 12 policy packages (including both taxes and subsidies) presented to the survey participants.

Table 2: List of policy interventions and design features used in the survey

<i>Policy number</i>	<i>Consumption tax on animal-based protein</i>	<i>Level</i>	<i>Revenue recycling</i>	<i>Coverage</i>
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1	Low	Not mentioned	National
2	Medium	Not mentioned	National
3	High	Not mentioned	National
4	Medium	Not mentioned	EU
5	Medium	Public spending	National
6	Medium	VAT removal of plant-based protein	National
7	Medium	Plant-based protein production	National
8	Medium	Sustainable agricultural production	National
	<i>Subsidies</i>	<i>Type</i>	<i>Financed through</i>
9	VAT removal	General public funds	
10	VAT removal	Animal based tax (medium level)	
11	Sustainable agricultural production	Animal based tax (medium level)	
12	Plant-based production	Animal based tax (medium level)	

2.3 The presentation of a policy package including both a tax and a subsidy

When a government aims to promote more sustainable food consumption through policy interventions, it must still manage and balance the fiscal budget. One approach involves combining subsidies with taxes. But how should such a policy package be presented? There are essentially two options: 1) A policy package with the tax first explaining that the tax generates funds that will finance the subsidy, 2) A policy package with the subsidy first clarifying that the funds necessary will be generated through a tax. Psychological literature shows that the order in which items are presented in a list can have a large effect on behavior, where first order items or last order items typically gain more attention (Belton and Sugden 2018; Shaugnessy et al., 2006). This phenomenon extends to the food consumption domain (Kim et al., 2018). For instance, the order of menu items can sway purchasing decisions (Gravert and Kurz, 2019). Will we observe an order effect also here and if so in what direction? Will focus be directed to the first or the second item, and will that influence support for the policy package? Figure 1 shows one example for how the different ways (order) in which present the policy package including a tax and a subsidy can look like.

Imagine a tax proposal that accounts for most of the climate damages and other negative environmental effects of production. It would, according to calculations made by scientists lead to price increases of the following magnitude:

Product category	Tax/price increase in SEK per kg
Pork	5
Beef	21
Cheese	9
Chicken	3

Scientists have also estimated that such a tax would generate about SEK 6 billion in revenues per year. These revenues will be used to subsidize a shift in Swedish food production. It will be paid out to support Swedish farmers to stimulate a production shift towards more plant-based protein sources.

What do you think of such a proposal?

I am very negative				I am very positive	I have no opinion
1	2	3	4	5	

Imagine a proposal where plant-based production is being subsidized in order to make it easier for consumers to find alternatives of plant-based protein. Imagine that the cost of such a proposal is estimated to 6 billion SEK and that the suggestion is that it will be financed through a tax on animal-based protein. It would, according to calculations made by scientists lead to price increases of the following magnitude:

Product category	Tax/price increase in SEK per kg
Pork	5
Beef	21
Cheese	9
Chicken	3

What do you think of such a proposal?

I am very negative				I am very positive	I have no opinion
1	2	3	4	5	

Figure 1: The left panel shows a tax proposal where revenues are used to subsidize plant-based protein production. The right panel shows a subsidy proposal where funding comes from a tax on animal-based protein.

The subsidy options we test for include a VAT removal on plant-based protein, a subsidy promoting more plant-based protein production, and a subsidy promoting more sustainable agricultural practices. The tax proposed is always the medium level tax with national coverage (the exact options we investigate are listed in Table 2). It is important to note that the sum made available through the tax as well as the sum needed to fund the subsidy is always the same in the two ordering options, implying that the effect on living costs is the same irrespective of ordering. Thus, the only variable that could yield different support levels is the ordering itself.

The order effect in presenting policy items can influence public support. If the subsidy is presented first and attracts more attention it could be favored considering the general tendency for disliking push policies (taxes) more than pull policies (subsidies). However, the order effect could also mean that the last policy item gets more emphasis, potentially reducing support for such policy packages. To our knowledge this feature (order effects of policy items) has not been tested before and we lack priors to inform our expectations and hypothesis. Hence, our hypothesis will be formulated accordingly (see Hypothesis 7 in Section 2.4).

To prevent survey fatigue, we streamlined the process for each respondent. We did so by letting respondents rate their support for a subset of the 12 packages. They evaluated two tax levels (out of three), two coverage levels (out of two), and two revenue cycling options (out of four). Each participant provided ratings for all subsidy packages. The order in which these policy proposals were presented was randomized for each participant. This approach balances data collection efficiency while ensuring meaningful responses.

2.4 Formulating hypotheses to guide the analysis

Based on previous literature (see sections 2.1-2.3) we test the following hypotheses.

- 1) A lower-level consumption tax on animal-based protein will have higher public support compared to a higher-level consumption tax on animal-based protein.
- 2) A consumption tax of animal-based protein with a higher coverage (implemented in the European Union), will have a higher support compared to a tax on animal-based protein implemented in Sweden only
- 3) When revenues from the consumption tax on animal-based protein are mentioned and specified to be used to further the protein shift (through a VAT removal) it will be associated with higher support compared to when not mentioned
- 4) When revenue usage of the consumption tax on animal-based protein is to be used to further a protein shift (through a VAT removal) it will be associated with higher support compared to when mentioned but not with the specific aim to further a protein shift
- 5) A subsidy in the form of VAT removal on plant-based protein financed through the public funds will have higher support compared to when it is financed with a consumption tax on animal-based protein
- 6) A subsidy in the form of VAT removal on plant-based protein will have a higher support than a subsidy directed towards production.
- 7) The presentation of a policy package where the order of the interventions used in the policy package differs will not matter for public support.

2.5 Statistical analysis

We use STATA12 to analyze the data. We use non-parametric Wilcoxon rank-sum test (MWW; also known as Mann–Whitney two-sample statistic; Wilcoxon 1945; Mann and Whitney 1947) to compare levels of support between two types of policy proposal, and Kruskal-Wallis test (Kruskall and Wallis, 2012) to compare if the level of support differs when we compare three different policy proposals.

We did a normality check (Shapiro-Wilk test; Shapiro and Wilk 1965) for all policy proposals and could not reject normality at the 5% significant level for all these variables (see supplementary material). We use Bonferroni correction to adjust for multiple comparisons (7 hypotheses), which implies that a significance level of 0.05 requires testing each hypothesis at alpha 0.007 (Dunn, 1961).

3 Results

3.1 Testing the role of design

The design features we tested for was the level of the tax (high, medium, and low), the geographical coverage (Sweden, EU), and the usage of the revenues from the tax. Results in Table 3 show that the level of the tax significantly influences support where lower tax levels are favored, which means we cannot reject Hypothesis 1. This result holds also after adjusting for multiple testing using a Bonferroni correction. However, we can reject the second hypothesis, the geographical coverage (comparing a tax levied nationally with one levied for all EU) does not significantly influence support. These results are also illustrated in Figure 2.

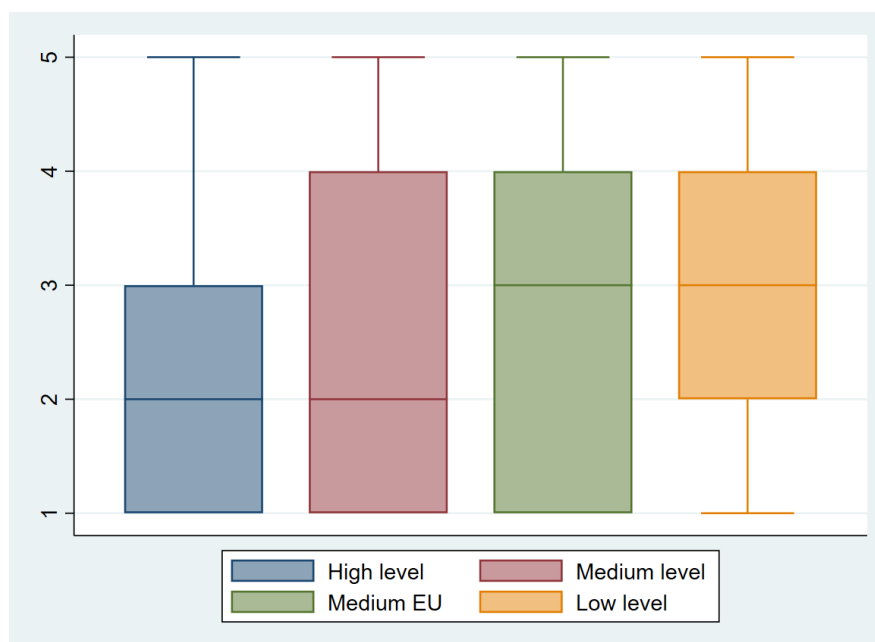


Figure 2: Boxplots showing distribution of support for different levels and coverage of a tax on animal-based protein.

Further, we can reject the third and the fourth hypothesis. The mere mentioning of revenues that can be used for public spending does not influence support significantly, nor does the specific usage of revenues (on a 5% level).

However, in terms of a VAT removal on plant-based protein we see a significant difference in support depending on funding model. Funding through an unspecified budget post is favored over funding through a tax on animal-based protein. Thus, we cannot reject hypothesis 5. These results are also depicted in Figure 3. After adjusting for multiple testing using Bonferroni correction the type of subsidy does yield significant differences in support. Thus, we reject Hypothesis 6.

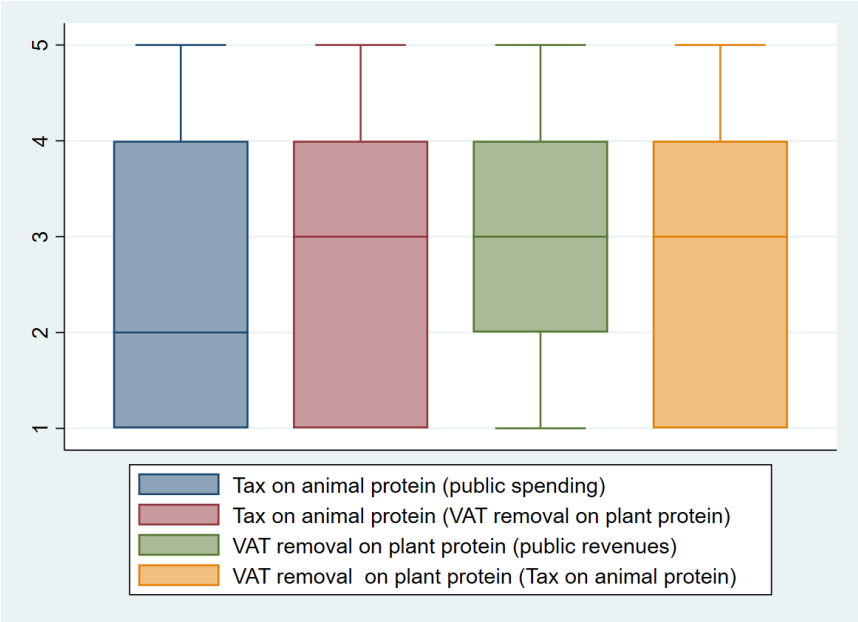


Figure 3: Box plots showing the distribution of support for tax designs with different revenue recycling options.

Table 3: Results from *non-parametric* tests on the role of design and presentation of different policy interventions (all p-values are based on Mann-Whitney U tests unless otherwise stated)

Level of tax (H1)	<i>High</i>	<i>Medium</i>	<i>Low</i>	
	mean (st.dev)	mean (st.dev)	mean (st.dev)	p-value (Kruskall Wallis)
	2.2732 (1.3140)	2.5069 (1.3517)	2.7833 (1.3340)	0.0001
				p-value
	2.2732 (1.3140)	2.5069 (1.3517)		0.0000
		2.5069 (1.3514)	2.7833 (1.3340)	0.0000
	2.2732 (1.3140)		2.7833 (1.3340)	00000
Geographic coverage of tax, medium tax level (H2)	<i>Sweden</i>	<i>EU</i>		
	mean (st.dev)	mean (st.dev)		p-value
	2.4914 (1.3442)	2.5515 (1.3646)		0.1694
Revenue recycling specified or not, medium tax level, national coverage (H3)	<i>Specified and can be used for any public spending.</i>	<i>Not specified.</i>		

	Mean (St.dev)	Mean St.dev)	p-value
	2.5244 (1.3597)	2.5069 (1.3514)	0.8063
Revenue recycling specified but used differently, medium tax level, national coverage (H4)	<i>Any public spending.</i>	<i>Removal of VAT of plant-based protein.</i>	
	mean (st.dev)	mean (st.dev)	p-value
	2.5244 (1.3597)	2.5559 (1.3794)	0.5579
Funding of VAT removal on plant-based protein (H5)	<i>Funding from public account.</i>	<i>Funding through a tax on animal-based protein with high carbon emissions (medium tax level).</i>	
	mean (st.dev)	mean (st.dev)	p-value
	2.9123 (1.3415)	2.5992 (1.3811)	0.0000
Type of subsidy (H6)	<i>Subsidy as a VAT removal of plant-based protein (funded by a medium level tax on animal-based protein).</i>	<i>Subsidy for more sustainable agricultural practices (funded by a medium level tax on animal-based protein).</i>	
	Mean (st.dev)	Mean (st.dev)	p-value
	2.5992 (1.3811)	2.6028 (1.3550)	0.0457
Presentation of policy packages (H7)	<i>Tax on animal-based protein with high carbon emission (medium tax level), revenues used for VAT removal on plant-based protein.</i>	<i>Removal of VAT on plant-based protein funded through a tax on animal-based protein with high carbon emission (medium tax level).</i>	
	mean (st.dev)	mean (st.dev)	p-value
	2.5559 (1.3794)	2.5992 (1.3811)	0.8742
	<i>Tax on animal-based protein with high carbon emission (medium tax level), revenues used to subsidize more sustainable agricultural production practices.</i>	<i>Subsidy for more sustainable agricultural practices financed through a tax on animal-based protein with high carbon emissions (medium tax level).</i>	
	mean (st.dev)	mean (st.dev)	p-value
	2.7460 (1.4430)	2.6028 (1.3549)	0.0254
	<i>Tax on animal-based protein with high carbon emission (medium tax level), revenues used to</i>	<i>Subsidy to more plant-based production financed through a tax on animal-based protein with high carbon emission (medium tax level).</i>	

	<i>subsidize more plant-based production.</i>		
	mean (st.dev)	mean (st.dev)	p-value
	2.6735 (1.4124)	2.4986 (1.3367)	0.0056

3.2 Testing the role of presentation

Lastly, we analyze if the presentation of a policy package involving both subsidies and taxes affect support. Table 3 shows indeed that the order of the policy items (tax and subsidy) in the presentation of the policy package can significantly influence policy support. However, we only find a significant difference in support when the subsidy item is a subsidy for promoting more plant-based production. In this case we find that support is higher when the tax is presented first.

We do not observe any significant differences in support for presentation (order of items) of policy packages involving any of the other two subsidy options (after correcting for multiple testing). We still reject hypothesis 7. Results are also presented in Figure 4.

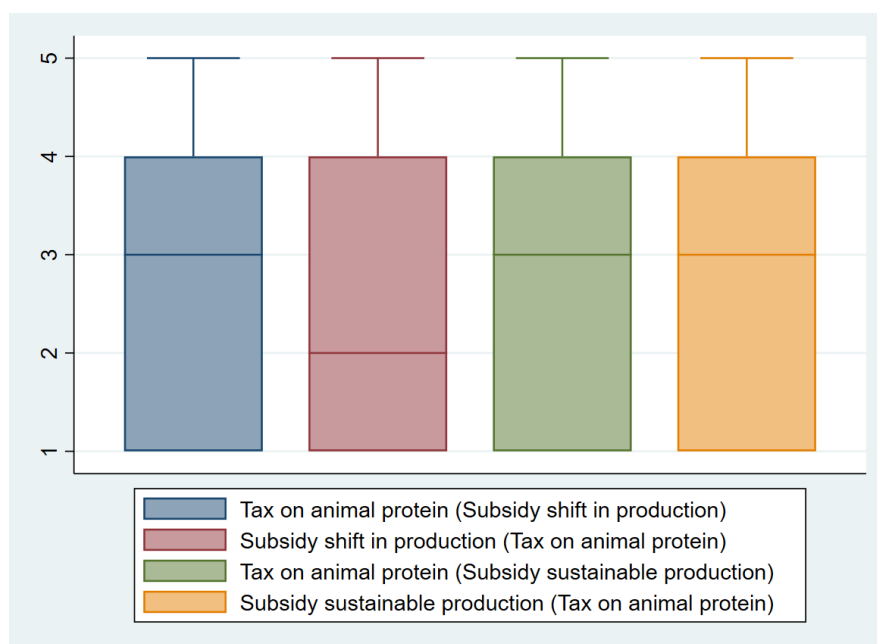


Figure 4: Boxplots showing the distribution of support for different presentations of policy packages involving a combination of a tax and a subsidy.

4 Discussion

We observe significant variation in support for different tax levels, indicating that citizens oppose food policies perceived as personally costly (H1). We thereby corroborate earlier research results investigating support for carbon taxes e.g., on fuels (see e.g., Beiser-McGrath and Bernauer, 2019). Gradual implementation may therefore be advisable to build initial support. Such a strategy can also be advocated based on research findings that people are generally more accepting toward costly policy interventions after implementation (Nilsson et al., 2016; Hensher and Li, 2013), possibly due to a status quo bias (Samuelson and Zeckhouser, 1988) and a tendency to overestimate costs associated with policy interventions (Schuitema et al., 2010).

If a concern exists among the respondents that a consumption tax on food may hurt the national economy (as found by Harring et al, 2018) or not be effective enough if only levied locally (Carattini et al., 2019), it is not strong enough to influence differences in support (H2). Moreover, how tax revenues are used (revenue recycling) does not significantly influence support (H3, H4). This contrasts with findings in the literature exploring support for carbon taxes, where revenue recycling has been found to play a crucial role (see e.g. Maestre-Andrés et al 2021; Beiser-McGrath and Bernauer, 2019; Klenert et al 2018). This difference could reflect the different policy domains. This in turn would suggest that it is more challenging to garner support for tax proposals with revenue recycling options in the food domain (compared to general carbon taxes or taxes implemented in the transportation sector). However, the lack of sensitivity to revenue recycling options could also be a result of the timing of the survey. The survey was launched during a time of high inflation, high energy and food prices and high interest rates, which may have resulted in overall low acceptance levels and too little variation in acceptance levels. To isolate a potential 'domain' effect one would need to test for such an effect more systematically where one can control for contextual factors such as the economic and political situation.

How a subsidy is designed matters for support. Financing a VAT removal on plant-based protein through a tax on animal-based protein faces more opposition compared to a VAT removal financed from an unspecified budget post (H5). Respondents may not associate the unspecified budget post as something that would affect them economically. It also seems that respondents showed a slight favoritism toward production-side subsidies over consumption-side subsidies (H6), suggesting that other concerns (not only personal cost concerns) influence acceptance. People may generally dislike policies directed toward consumers, even in the form of subsidies.

When combining an animal-based protein tax with a VAT removal on plant-based protein, presentation (the order of the policy items) does not significantly influence support. However, when the subsidy targets production, presenting the tax first yields significantly higher support.

Our respondents are opposing costly interventions (H1) and are more in favor of production-side subsidies (H6). Thus, if there is an order effect, this suggests more emphasis is given to the second item on the list. It is noteworthy that the different policy package proposals are identical except for the order in which the interventions in the policy package are presented. Thus, the only explanation for the results is due presentation (order effects). However, an order effect where more attention is given to the second item would by the same logic also imply a higher support for the policy package where the costly tax on animal-based protein is presented before introducing that subsidy in the form of VAT removal on animal-based protein. We do not find support for such an effect. Again, perhaps people generally dislike policies (and equally so) that are directed toward consumers, which would explain the lack of significance.

We encourage further investigation into the role of order effects for support in policy design. Additionally, the tendency to favor production-side subsidies warrants exploration. Our study contributes unique findings, but more research is needed to corroborate or challenge them.

While our study identifies significant variations in support for different tax and subsidy proposals, it is essential to recognize that these differences, although statistically different, remain relatively small and still below an average level that would indicate that the public approves of the policy proposal. This prompts a critical question: Is designing policy schemes truly effective? Alternative approaches could for instance instead focus on how to best design complementary measures like information campaigns to enhance acceptance. It could also involve investing in measures directly targeting strongly opposing partners, for instance those likely to be affected the most financially. On the other

hand, even minor shifts in public opinion can play a crucial role and may be precisely what is needed to reach a tipping point toward majority acceptance. We encourage and welcome further research also to explore cost-efficient strategies for shifting public opinion toward pricing instruments.

Lastly, we want to highlight that our results (like many others) are based on stated preferences and not actual voting behavior and were obtained in a specific context. One needs to be careful not to interpret the level of support as true levels of support (or lack of support) for actual policies. Instead, they can potentially be viewed at most as a sort of temperature check, signaling variations in public opinion related to specific policy proposals in a specific time and context. We therefore highlight the need for further investigations of systematic patterns of attitudes and acceptance toward different types of policy interventions, not only across domains, but also economic contexts and political climates.

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