



Citizens Views on Policy Instruments for Sustainable Food Consumption From Spatial Perspective

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To mitigate climate change, large GHG emission reductions need to be made in several sectors of the consumer society. This calls for policy instruments that guide citizens in adapting their behavior. In Finland, a mid-range climate strategy is set for each governmental period to reach GHG emission reductions. For the renewal of the strategy, the Ministry of the Environment organized a citizen survey in 2021 to gain better understanding on how citizens perceive the impact of selected policy instruments and what kinds of actions citizens imagine taking to reduce their consumption. More than 18,000 citizens replied to the survey. This research analyses the perceptions of citizens in how different policy instruments related to food target respondents in different residential areas. The responses are examined for urban, peri-urban and rural areas to find out whether there are differences in how respondents in different spatial context perceive the impact of the policy instruments. The analysis reveals that there are small but statistically significant differences in results depending on the area of residence. People living in rural areas consider themselves to be more impacted by most policies than the urban residents. Responses to open-ended questions are analyzed to find out how people imagine how they could increase the share of plant-based food in their diets and reduce food loss and whether there is a difference in responses between urban and rural responses. Suggestions for future policy design for food consumption are made based on the findings.

Keywords: citizen views, policy instruments, spatial differences, sustainable food consumption, empirical research

INTRODUCTION

Climate change puts pressure on policy making to guide consumption toward sustainability. Moran et al. (2020) have estimated that consumer initiatives targeting changes in consumer behavior could reduce the carbon footprint in Europe by about 25 percent. One important consumption domain in this respect is food. Indeed, the food we eat has significant implications to greenhouse gas (GHG) emissions. Previous research has highlighted that the consumption of meat and dairy products alone induce more emissions than the worldwide mobility, including road transportation, trains, shipping and air travel (Bailey et al., 2014 retrieved from Capstick et al., 2014). Creutzig et al. (2016) suggest that a dietary shift could reduce greenhouse gas emissions by more than 70 percent compared to a trend in 2055, which would surpass the potential induced by technological options. Hallström et al. (2015) in their review study found that changing the diet from meat toward more

plant-based diet could reduce GHG emissions by 50 percent. Simultaneously, FAO (2011) has estimated that annual edible-food waste amounts to 1.3 billion tons globally, which means that one-third of edible food is lost. In the EU-28, it is estimated that 88 million tons of food waste is generated annually (Stenmark et al., 2016). There is thus a dire need to examine possibilities to reduce greenhouse gas emissions from food consumption.

In Finland, greenhouse gas emission reduction strategies are guided through a climate law. The climate law stipulates that for each governmental period a mid-range climate strategy must be renewed to guide the effort sharing sector to continuously reduce the greenhouse gas emissions (MoE, 2021). The renewal of the mid-range climate strategy is currently guided by the governmental target that Finland is climate neutral by 2035 (Finnish Government, 2019). The governmental program highlights the need to reduce the Finnish carbon footprint of food and aims at reaching this target by increasing the share of plant-based food in the public purchases and food services, and by halving food waste by 2030 (ibid.). Back in 2017, a FinDiet 2017 survey showed that meat-based products are included in the diet of almost every Finn (Valsta et al., 2018). A recent study found that meat and dairy products account for approximately 65 percent of the climate impacts of the diet of Finns (Saarinen et al., 2019).

The responsibility of the renewal of the strategy lies on the Finnish Ministry of the Environment. A lot of emphasis is put on the openness of the process and engaging the public in discussions about the strategy with the aim to produce more knowledge and develop policies to support the establishment of a just climate strategy. In order to gain a better understanding on citizen's views related to policies that target the largest emissions producing consumption domains at the effort sharing sector, a survey open to all citizens was organized between Jan 19-Feb 19, 2021, and was launched at the website of the Ministry of the Environment. The survey gained a lot of media attention and more than 18,000 people responded the survey, which is a very high number of respondents for such processes in Finland.

The survey focused on asking people about the impact of selected policy measures related to food, housing and mobility. The open questions were directed at asking about people's imaginaries on what it would take for them to adapt their behavior in the future and, related to food, to reduce their meat consumption and the generation of food waste. Previous research has found that there are hardly any demand-side policies targeting the lowering of animal-based food consumption in general (Temme et al., 2020). In Finland, previous such policy instruments include obligatory vegetarian food options offered in public facilities as well as vegetarian days at schools and day-care centers (e.g., Wolff et al., 2017). There is thus clearly a need for more understanding on perceived impacts of policy instruments and options for citizens. Studies have also started to highlight the growing role of cities in governance toward sustainability and a reform in the food system (e.g., Baker and de Zeeuw, 2015; Baker et al., 2021).

This article analyses the survey data from the spatial perspective and focuses on examining demand-side policies targeting sustainable food consumption from the point of views

of residents in rural, urban and peri-urban areas, because lifestyles and options viable to citizens in how to adapt their behavior can differ based on context. In addition, local authorities are given a larger role in guiding toward sustainability reforms (Baker et al., 2021). It is thus important to know, whether the impact of policies also differs in various spatial contexts. The research question of the article is how citizens perspectives on climate policies differ based on area of residence. The results are discussed in the light of what needs to be taken into account, if the effectiveness of policies is to be increased among citizens in the consumption of food.

After the introduction, this article first examines previous literature on policy from the perspective of sustainable consumption in the food sector. The third section describes the research setting, the survey data and the methods of the empirical analysis. The fourth section presents the results of the analysis focusing on the perceptions of the respondents on different policies' influence related to food in different areas of residence. The final section discusses the findings that rural respondents feel especially targeted by the policies and concludes with policy recommendations.

FINDINGS FROM PREVIOUS LITERATURE

Several studies in recent decades have examined the potential to reduce greenhouse gas (GHG) emissions through behavior change initiatives (e.g., Thøgersen, 2005; Capstick et al., 2014; Creutzig et al., 2016). Research on sustainable consumption has also targeted studying the role of climate policies in GHG emission reductions (e.g., Grubb et al., 2020). Nissinen et al. (2015) found in their study that sustainable consumption offers an effective lever for climate policy in Finland and that policy instruments targeting food, transport and housing have had large impacts on GHG emissions reduction.

Food consumption has been often studied from the health perspective (Biermann and Rau, 2020; Sievert et al., 2020), yet increasing awareness of climate change calls for studies examining the sustainability implications of food, and especially meat consumption. The sustainability implications of meat consumption mainly emerge from the resource intensity of meat production compared to the production of plants (e.g., Eshel et al., 2014; Niva and Vainio, 2021). Hartmann and Siegrist (2017) have reviewed research on consumer perceptions and behavior on sustainable protein consumption, and highlight that previous studies have not much explored how people could be motivated to decrease their meat consumption. They call for population level studies focusing on factors that could help a shift toward a more plant-based diet. Previous research has also recognized a need to further investigate the effects of social, temporal, and situational factors of meat eating (Horgan et al., 2019; Biermann and Rau, 2020). Baker et al. (2021) note that urbanization has given cities and sub-national actors more prominence in food governance in many countries, which calls for attention to spatiality issues of policy governance.

In the Finnish context, Honkasalo (2011) has studied how the policy making targeting sustainable consumption and

production has been initiated, and its impact on lifestyles, and highlight the crucial role of the spatial structure of communities in the context of sustainable consumption. Wolff et al. (2017) have investigated sustainable food consumption from the perspective of public policy. Huan-Niemi et al. (2020) examined the impacts of dietary changes to GHG emissions and policies how to guide the Finnish food system. Kaljonen et al. (2018) have found that provision of food services also directly affects our food choices and, therefore, modifying the choice architecture can support sustainable choices (Kaljonen et al., 2018). This study examines responses to survey question “What would make you eat more vegetarian food” for two spatial contexts and explore consumer views on increasing vegetarian food in their diet.

Food waste has been recognized as a significant source of detrimental environmental impacts. Benyam et al. (2018) call for more understanding of behavior drivers relating to food waste as a basis of efficient policies. In their research focusing on citizens views about how to reduce food waste, they found four options to reduce food waste: home composting, community composting, organized residential food waste collection and prevention focusing on education to avoid over-purchasing and over-consumption. Wilts and O'Brien (2019) have studied the influence of policy mixes on minimizing food losses and waste and call for further research in different national contexts to investigate institutional structures best apt to reduce food loss. Also Schinkel (2019) notes that knowledge about the suitability of policy instruments for food waste prevention is lacking. This study examines responses to survey question “What would make you reduce food loss” for two spatial contexts to explore consumer perceptions on reducing food waste.

Demand-side policies targeting food are far more often focused on health issues rather than sustainability (Temme et al., 2020). In policy making, a challenge is posed by the fact that policies targeting food and diets target on one hand a very private behavior and on the other something that is culturally shared. While various approaches to nudging individual consumer behavior have gained attention in recent years (e.g., Reisch et al., 2013; Lehner et al., 2016), in democratic societies it is generally been considered difficult to directly intervene in individual decision making. Another difficult issue is placing the responsibility of climate change mitigation on individuals (Schanes et al., 2019). There is also no guarantee on the policy effectiveness of instruments targeting behavior change (e.g., Ekins et al., 2019). Indeed, Hobson (2002) has even found that attempts to convince people about the benefits of sustainable lifestyles may even actively alienate individuals from sustainability. In addition, promoting sustainability has been found to be a collective issue (Røpke, 2009). De Schutter (2019) notes that as food choices are much impacted by the options available (cf. also Kaljonen et al., 2018), the problem of reforming the food system is systemic and cannot be based on individual activities only but call for a policy approach.

In Finland, guiding consumption with policy instruments targeting the reduction in greenhouse gas emissions from consumption has a long tradition (e.g., Mickwitz et al., 2011; Heiskanen et al., 2014; Nissinen et al., 2015). The study of

Nissinen et al. (2015) found that evidence of the effectiveness of the measures are essential both for the success and for the acceptability of climate policy. Loukopoulos et al. (2005) have shown that acceptability of a policy instrument can be increased by showing the efficacy of the policy instrument (Loukopoulos et al., 2005). Research on the acceptability of adding vegetarian food to the diets is increasing, although more of the focus is on meat and meat substitutes. Abrahamse et al. (2009) have investigated the acceptance of information material related to vegetarian options among students. Respondents' perceptions of the health effects of meat and vegetables influenced the credibility of the messages. However, the respondent's previous habits and strong identity as a meat-eater had the greatest impact on the evaluation of the information material. Espinosa and Nassar (2021) have studied the acceptability of food policies and distinguish three influential factors: awareness of the issue, the legitimacy of state intervention, and social norms.

Hence, acceptability and public trust are important for the effectiveness of climate policy instruments (Nissinen et al., 2015) as the steering effect of several instruments requires active participation of citizens. Policy instruments have an impact on citizens' daily lives but their direct effects on the climate change mitigation can be difficult to detect, which highlights the importance of open processes in policy making and gaining trust to ensure the acceptability of policies. Increasing knowledge and gaining understanding on citizen views on various policy instruments is thus key in climate policy making. Without the acceptance, participation and engagement of consumers and citizens, advances in sustainability will not be possible (Hobson, 2002; Reisch, 2021). Policy instruments need to gain legitimacy from the citizens, which is possible, if measures are perceived just and impacts seem fairly distributed. Garnett et al. (2015) have studied attitudes toward healthy diets and factors influencing the effectiveness of food policies and find that there may be many reasons for the ineffectiveness of a policy instrument including issues such as attitudes, knowledge of the environmental impacts, acceptability or legitimacy of policies etc. Hence, one of the objectives of this article is to shed some light to reasons of in-effectiveness of policies and differences in spatial contexts from a survey focusing on policies aiming to reduce climate related emissions.

METHODS AND DATA

In this section, the methodology of the research executed is explained. First, the research setting is described. Then the data used is presented. Finally, the analysis methods are presented and discussed.

Research Setting

This article considers demand-side policy instruments that are intended to change individual consumer behavior in food consumption contributing to climate change. Hence, the discussions related to policy instruments in this article refer to such instruments and to the examined three in particular. The analysis focuses on differences in views between respondents

related to their area of residence. The research question is how citizens perspectives on policies differ based on area of residence.

The examined policy measures are not only about reducing consumption levels but about shifting consumption toward other, less GHG emitting sources. An example of the survey questions is “How much would it impact your food choices if low-emission food products were cheaper than other food products (e.g., as a result of changes in VAT or other taxes)”. The research setting of this article examines the survey data from the point of view how residents in different areas consider the impact of individual policy instruments, that is, their effectiveness in guiding toward emission reductions. Effectiveness is here understood in the sense that if the respondent perceives that the policy instrument does not influence their behavior, then it is not effective as an instrument attempting to guide toward emission reductions. The statistically significant differences emerging from the quantitative analysis justify the consideration of the responses to the open-ended question focusing on rural and urban respondents separately. The open-ended question guide in understanding reasons for the perceived level of impacts and the future imaginaries of the respondents in how to change their behavior and lifestyles and potential objections to changes.

The independent variable is the perceived influence of a policy, and the dependent variable is the spatial context. The null hypothesis H_0 is that there are no differences in the perceived impacts of responses between different spatial contexts. The H_1 hypothesis is that there are statistically significant differences in the perceived impacts of the respondents' behavior in different spatial contexts.

Data

The data used in this research was collected by a survey on the internet by the Finnish Ministry of Environment during Jan 19–Feb 19, 2021. The purpose of the survey was to gain better understanding on the citizen's views on policy instruments for the renewal of the mid-range climate strategy of Finland called “KAISU.” The data is accessible openly *via* the Ministry of the Environment, and the direct distributions of the responses are available on the internet¹ The consumption domains targeted in the survey are food, mobility and housing, which account for the majority of emissions in the effort sharing sector for greenhouse gas reduction. Here, the focus is on policy instruments guiding food consumption.

The data is comprised of 18,378 responses, which is very high in the Finnish context. The Finnish population is circa 5 550 000 people in 2022 (Statistics Finland, 2022). As the survey was openly available on the internet, it is impossible to say anything about the who the survey did not reach or who chose to answer. The vast majority of the respondents (90%) had heard about the survey from somewhere else than from the homepages of the Ministry of the Environment (5%) or through an organization (unspecified) (4%). During the time of the survey, a lot of media attention was directed to the survey, which may explain the high

number of responses and account for the majority of responses from an unspecified source.

The survey included multiple-choice questions measuring the perceptions of the respondents on policy instruments targeting food, mobility and housing domains, for how much these policy instruments impact the situation of the respondents (11 questions). The impacts of policy instruments related to food were examined in three questions and are analyzed in this article. The respondents were asked to reply to a question “*How much would the policy option impact your food choices?*” and the following three policy options were listed: 1. Low-emission food products would be cheaper than other food products (e.g., as a result of changes in VAT or other taxes). 2. Clearer information / information dissemination on food packaging labeling (e.g., origin, climate impact or health impact). 3. Vegetarian food first in canteen line and smaller plate sizes in food services. **Table 1** shows the frequencies of the responses in different spatial contexts. The policies examined are also presented in the Results section in the **Table 2** analyzing policy options. In addition, the survey included open-ended questions. The open-ended question examined here targets the emission reduction related to food from a personal perspective: “What would make you eat more vegetarian food or reduce food loss?”

As background variables, the survey included a question related to the area of residence and a broad categorical multiple-choice question about the age of the respondent, as well as a question, from where the respondent heard about the survey. Therefore, it cannot be assessed, whether the survey is representative of the Finnish population as such as also others factors, like gender, income and education can have high influence on the food consumption and attitudes toward food stuff (meat consumption especially) and for the acceptance of certain policy instruments trying to influence food consumption (e.g., Garnett et al., 2015). Further limitations to the use of survey are discussed in the discussion section. Related to the area of residence, in 2019, 61% of Finns lived in an urban area, 11% peri-urban area and 27% in rural areas (Statistics Finland, 2021). In Finland, already a central conurbation with more than 15 000 residents is functionally defined as an urban area and those usually include citylike surrounding areas (peri-urban), whereas rural areas are mostly areas with high shares of agricultural areas and forest and low population density [which on average is very low in Finland: 18,3 inhabitants per square kilometer 1.1.2022 (Kuntaliitto, 2022)]. In that sense, the respondents of the survey may not be quite representative to the actual distribution as 50% of the respondents report that they live in urban area, 23% peri-urban and 27% in rural area. The share of rural respondents reflects accurately the share of rural residents in the country, but the shares of peri-urban and urban are less well representative. Nevertheless, as the survey did not specify, what is understood as peri-urban and urban, the difference could be due to how the respondents have perceived their area of residence.

Analysis Methods

In the statistical analysis, a nonparametric Kruskal-Wallis test was used as the dependent variable does not follow a normal distribution for each category of the independent variable based

¹https://www.motiva.fi/julkainen_sektori/ilmastosuunnitelman_kansalaiskyselyn_tuloksia

TABLE 1 | Frequency table to the question “How much would the policy option impact your food choices?” in different spatial contexts.

	Count	Urban	Peri-urban	Rural	Total
Low-emission food products would be cheaper than other food products (e.g. as a result of changes in VAT or other taxes)					
Not relevant to me	<i>n</i>	198	104	185	487
	%	41	21	38	100
Has no influence on me	<i>n</i>	1,947	995	1,568	4,510
	%	43	22	35	100
Has a small influence on me	<i>n</i>	3,585	1,726	2,000	7,311
	%	49	24	27	100
Has a large influence on me	<i>n</i>	3,448	1,318	1,242	6,008
	%	57	22	21	100
Total	<i>n</i>	9,178	4,143	4,995	18,316
	%	50	23	27	100
Vegetarian food first in canteen line and smaller plate sizes in food services.					
Not relevant to me	<i>n</i>	768	319	535	1,622
	%	47	20	33	100
Has no influence on me	<i>n</i>	4,263	2,225	2,853	9,341
	%	46	24	31	100
Has a small influence on me	<i>n</i>	2,784	1,117	1,116	5,017
	%	55	22	22	100
Has a large influence on me	<i>n</i>	1,363	482	491	2,336
	%	58	21	21	100
Total	<i>n</i>	9,178	4,143	4,995	18,316
	%	50	23	27	100
Clearer information / information dissemination on food packaging labeling (e.g., origin, climate impact or health impact).					
Not relevant to me	<i>n</i>	73	48	79	200
	%	37	24	40	100
Has no influence on me	<i>n</i>	1,618	862	1,057	3,537
	%	46	24	30	100
Has a small influence on me	<i>n</i>	3,882	1,794	2,048	7,724
	%	50	23	27	100
Has a large influence on me	<i>n</i>	3,605	1,439	1,811	6,855
	%	53	21	26	100
Total	<i>n</i>	9,178	4,143	4,995	18,316
	%	50	23	27	100

on analysis of skewness and kurtosis and the Shapiro-Wilk's test (Shapiro and Wilk, 1965). Kruskal-Wallis test is used to compare whether two or more independent groups statistically differ from each other (Ostertagová et al., 2014; MacFarland and Yates, 2016). Dunn's test, as a multiple comparison test, is used to determine which of the three means differ significantly from one another in an analysis of variance (Cramer and Howitt, 2004). The variables measuring how much each policy instrument targets the respondent are measured on ordinal scale from “not relevant to me” (0), “has no influence on me” (1), “has a small influence on me” (2) to “has a strong influence on me” (3).

Thematic analysis was used to analyze the responses to the open-ended questions (cf. Neuendorf, 2019). The data comprises

an overwhelming 12,798 responses to the open questions, which would call for an approach based on computational language analysis methods, such as topic modeling. In addition, as the survey questions were formulated somewhat ambiguously, so that the open-ended question examining the imaginaries of the respondents included two different questions, topic modeling would be very useful in identifying different topics and help keep responses to different questions separate. Nevertheless, topic modeling can extract topics that were discussed and would produce a systematic analysis of the topics introduced (see for example Repo and Matschoss, 2021) but would not enable the connection of in what sense the response was meant, and therefore for this study such a computational analysis was deemed less useful.

Therefore, there was a need to make some limitations to the analysis of the responses to the open-ended questions. Hence, only the responses of such respondents were analyzed, who had responded that the policy instruments would not change their behavior, in order to understand potential reasons. For this, an average of the responses relating to the influence of the three instruments was calculated and responses below and above 1 (1=has no influence on me) were excluded. The statistical analysis of the questions measuring influence revealed a statistically significant difference between rural and urban responses for each policy instrument, but not for each instrument between peri-urban and urban or rural and peri-urban. Therefore, another practical limitation was made to analyze only the open-ended questions of the rural and urban respondents. These limitations resulted in the analysis of 1,603 urban responses and 1,107 rural responses.

The responses to the open-ended question were analyzed with the use of Excel for Microsoft 365. Different thematic codes were given to responses depending on whether the response was about dietary change or about food waste. Subcategories were added as they emerged from the responses. One response could have several codes as the question also included two different issues.

RESULTS

In this section, I first present the results of each policy instrument for food consumption, and how it influences respondents in different areas. I then discuss the findings from open-ended questions in relation to food consumption and areas. When looking at the median values of the overall responses, the respondents consider the examined policy instruments to have small or moderate impact on their behavior in. For each policy instrument, there is a difference in influence between the rural and urban respondents.

Influence of Policy Instruments on Food Consumption

A Kruskal-Wallis H test shows that there are statistically significant differences in food related policy options between respondents in different areas (**Appendix Table A1**). The analysis of effect sizes shows that the area of residence explains a very small percentage of the difference in responses related to food,

TABLE 2 | Food related policy options. How much would the measure affect the food choices? Pairwise comparisons.

Dependent variable	Independent variable sample 1-sample 2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig. ^a
Low-emission food products would be cheaper than other food products (e.g., as a result of changes in VAT or other taxes)	Rural - Peri-urban	998.946	104.594	9.551	0.000	0.000
	Rural - Urban	1577.554	87.518	18.025	0.000	0.000
	Peri-urban - Urban	578.609	93.163	6.211	0.000	0.000
Vegetarian food first in canteen line and smaller plate sizes in food services.	Rural - Peri-urban	692.491	102.078	6.784	0.000	0.000
	Rural - Urban	1247.147	85.412	14.601	0.000	0.000
	Peri-urban - Urban	554.656	90.922	6.100	0.000	0.000
Clearer information / information dissemination on food packaging labeling (e.g., origin, climate impact or health impact).	Rural - Peri-urban	-59.309	103.361	-0.574	0.566	1.000
	Rural - Urban	537.460	92.064	5.838	0.000	0.000
	Peri-urban - Urban	478.151	86.486	5.529	0.000	0.000

^aEach row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same. Asymptotic significances (2-sided tests) are displayed. The significance level is 0.050. Significance values have been adjusted by the Bonferroni correction for multiple tests. Statistically significant values are marked in bold. The numbers for adjusted significance show the likelihood of an error if one rejects the null hypothesis that the distributions are the same.

from 0.3 to 1.8% of responses. The price regulation would have the largest impact of food related policy instruments.

The **Table 2** shows the results of pairwise comparisons of the spatial context. The policy option related to lower prices for low-emission food products shows the largest difference in impacts between the rural residents and urban and peri-urban residents. The difference is statistically significant also between the urban and peri-urban residents. The price of food products would impact the choices of rural respondents more than urban respondents. The same applies for the policy related to design architecture of offering vegetarian food first in the canteen line. Policy option for offering more information on food packaging, however, does not differ statistically significantly between rural and peri-urban areas, but differs between peri-urban and urban and between rural and urban.

Each of these policies would thus impact the rural residents more than urban residents. There are also statistically significant differences between peri-urban and urban residents. Information guidance shows smallest and least differences regarding the area of residence.

What Would Make You Eat More Vegetarian Food or Reduce Food Loss?

The open-ended question was analyzed to gain understanding of the reasons behind the statistically significant differences in responses analyzed in the previous sections. Looking at the responses two very frequent responses to a question “*What would make you eat more vegetarian food or reduce food loss?*” show little differences between urban and rural respondents. Most frequent response altogether was a simple “nothing” (58% rural, 49% urban, see **Table A2** in the Appendix for more detailed frequencies). Many respondents seemed to interpret the question as an ultimatum and responded accordingly: no regulation would

make them change their eating habits and any regulation would rather backfire and in fact, one would even buy more meat, if there were some regulation, and some stated that they would even move to another country. By quite a few respondents the question was also interpreted as a request to stop eating meat altogether and thus such option as increasing vegetarian options voluntarily to the diet was vehemently opposed. Even asking such a thing is considered “dictatorship.” Nevertheless, some residents responded that vegetarian food is “crap,” but stated that they do like to eat vegetables and fruit, so it is unclear what they consider vegetarian food.

The second most frequent response to the question was “the price reduction of vegetarian options or the price increase of meat” (for example in form of changes in the value added tax) (good 7% in both areas). Nevertheless, there was a certain reluctance to be seen in some of the responses also here: the more vegetarian option was viable for the respondent “only if the prices of other products were to increase by thousand percent,” “meat was not available at all,” or in occasion of “war”/“death”/“gun against the head”/respondent “turning into rabbit”/“carrot turning into sausage.” In both urban and rural context (1.6 and 1.7%) the respondents highlighted their mistrust to the climate change narrative and to the claimed health effects of more vegetarian food. Some underlined that they would/do eat (more) vegetarian food “but not because of the climate.” In many responses there was a general disapproval of the idea that a government or officials would guide food choices in any way. Food was thought to belong to a realm of a private life, and nobody should interfere: “this is ridiculous.” So the legitimacy of the policies was quite strongly questioned by many respondents.

A common feature (circa 3%) is also “the taste and good quality of vegetarian food” that would encourage choosing a vegetarian option. The key differences between the urban and

rural respondents relate to “already eating mostly vegetarian food” (urban 8.2% and rural 1.8%) and the origin of the food. Many more urban respondents state that they already are vegetarian or vegan, or vegetarian food forms the majority in the diet, so there is nothing to be done. The rural respondents highlighted as an important factor for choosing more vegetarian food to their diet, if its origin is national or the local context, or if it is local biological production. A clear distinction between the areas was highlighted in few responses of the rural residents: meat was considered to enforce self-sufficiency, as “anyone could easily grow their own animals for food.”

Interesting is the finding that in urban areas many more respondents state that health reasons prevent them from eating more vegetarian food. In urban areas almost 3 percent of respondents reported health as a reason, whereas almost 1 percent the rural respondents reported this as a reason. Some specified their health issue as an allergy.

While some respondents suggested increasing information dissemination as a tool, the responses indicate that the unfortunate truth of the urgency of climate change mitigation has already reached most of the respondents and that the message is so frustrating that it needs to be rejected altogether. The threatening changes to lifestyles seem so large that it is easier to ignore to message and claim it green nonsense.

Related to reduction in food loss, somewhat more than a quarter of both urban and rural respondents stated that food loss does not occur in their household (urban 28%, rural 27%), so there is no difference between the areas in terms of food loss. Many rural residents highlighted that they do not produce food waste because they compost any leftovers. Both rural and urban respondents responded that they already have taken action and the loss is practically zero; especially convincing were respondents merely stating: “we have a dog.”

Many respondents felt that it is a reasonable and economic way to keep food loss at minimum. Many declared that they considered reducing food loss important; yet proposing measures, how they could reduce food loss themselves were less widely visible in the responses. Some proposed collecting leftover food from schools and restaurants to give it to the poor. Some respondents suggested information campaigns. Some claimed that especially fruits and vegetables are a cause for food loss, as they rot fast. Several respondents, especially in rural areas declared, however, that as leftover food goes into a compost, it is not really wasted, but turns into cultivatable soil again.

As possible solutions for reducing food loss the respondents highlighted the impact of considerable price reductions for expired food stuff and many considered the expiry dates as artificial and suggested loosening the regulation in this regard. As an example, the respondents suggested that “the prices of products close to expiry date could be reduced e.g., by 70% and already expired products sold with 90% reduction.” In addition, “the responsibility of stores for selling good quality products should be removed, if a customer chose to buy an expired product with extreme price reductions.”

The sizes of the packages should be more varied to better match different situations in life. Single households need smaller options and larger households bigger options and some need

something in between. According to some respondents, the family internal dynamics caused food loss, yet in order to reduce it further, drastic measures would need to be employed such as “changing the wife doing grocery shopping.” In such context, a suggestion was often made that “planning the weekly menu or the shopping list better” might reduce food loss.

Especially the rural respondents highlighted that buying more locally produced food the losses could be reduced. Somewhat more frequently the urban respondents (1.4%) called for more ready meals, more easy options and easy recipes for vegetarian foods than the rural respondents (0.7%).

DISCUSSION AND CONCLUSIONS

This article examines the results of a survey that has focused on the impact of selected policy instruments and the imaginaries of the respondents what it would take for them to reduce their meat consumption and reduce food waste. The results of the analysis show that all policy instruments included in the survey have been assessed to have only a small or moderate impact on the respondents based on the median values of the overall responses. The responses to the open-ended question show that the impact of food related sustainability policies is questioned. The responses show that some respondents question the reliability of information related to the climate and health impacts of policies and plant-based diets (e.g. Loukopoulos et al., 2005). This indicates a general need to design more impactful policy instruments that could provide people with more and reliable information on the impacts of (even incremental) shifts in lifestyles.

The analysis of the open-ended responses focuses on responses of respondents that report no influence of surveyed policies in order to be able to make some initial suggestions to why perhaps policies are experienced differently between residential areas and why the impact of the examined policy instruments has been considered small. In this category of responses, an unsurprisingly large share of respondents claimed that nothing would influence them to eat more vegetarian food. Some respondents declared themselves as meat eaters, but from a very ideological point of view. This seems to be even more the case for rural residents. Hobson (2002) also shows that for such people, social justice is more important, thus policies attempting to guide food consumption would need to be designed with a strong focus on socially just impacts considering the different circumstances of urban and rural residents.

The social or temporal factors suggested influential in previous research (Horgan et al., 2019; Biermann and Rau, 2020) did not clearly come up in relation to a change in diet. Justification for meat eating was founded more on claims about the energy intensity of meat compared to vegetarian food. Many also stated that they believe in and eat according to the “plate-model recommended by the Finnish health officials for decades” (Finnish Food Authority, 2022), which is based on principles of filling the plate half with cooked or fresh vegetables, a quarter with rice, pasta or potatoes and a quarter with meat, fish or legumes. Furthermore, the survey results reveal a similar actuality

that has been reported previously by Hobson (2002) that trying to compel sustainable lifestyles to people may even alienate them even more from the attempted change as was witnessed in some very extreme and resentful responses. Some of this frustration could be due to people already trying to eat according to recommendations of the health authority. They have already made lifestyle adjustments, and possibly further changes seem too unreasonable.

The classification of Espinosa and Nassar (2021) of dimensions of acceptability could be found in the responses to the open-ended question, albeit there was little difference between the spatial context: awareness of the issue, the legitimacy of state intervention, and social norms. Following the social norms could be seen in the responses highlighting the diet based on the official recommendation of the food authorities (the plate model). Legitimacy issues came slightly more forth in the responses of the rural respondents. In general, it was questioned whether the state has a right to intervene in food choices of the citizens. In both contexts, the respondents seemed to be quite aware of the issue, but this could be explained by the way the survey was organized: it was visible in the media, so those people chose to respond who felt that they have something to say in the matter.

These results show that for each named policy instrument, there is a statistically significant difference between the rural and urban areas. This article, therefore, argues that due to uneven impacts on how policy instruments influence citizens in different spatial contexts, policies do not lead to equally distributed behavior changes and thus optimal GHG reduction. This indicates a need to consider, whether separate policy instruments for rural and urban areas are called for, if policy making is to be efficient in reaching its targets. A just and efficient way of policy making could be to design different policy instruments for different areas rather than have the same instrument in all areas. Nevertheless, adjusting the details of the policy instruments might be adequate or drafting policy mixes or policy packages to take into account the area of the residence. Investigating various policy packages to account for the area of residence would be an important topic for future research and whether such policy making would be acceptable to the citizens. As urbanization is advancing all over the world, adjusting policies separately for various areas is a suggestion to be considered also internationally and beyond the context of Finland. Yet, as food is very related to the local and national cultures, it is likely that there are large differences in what is efficient and acceptable in various cultures, locations and countries (see e.g., Garnett et al., 2015), which would warrant more future research.

The instruments examined in this survey are very much based on individual actions and the interest has been in the change of individual behavior. Several scholars note that demand-side policies on consumption might not be useful, if they focus on individual responsibility on sustainability (e.g., Hobson, 2002; Thøgersen, 2005; Røpke, 2009; Grubb et al., 2020). As a topic for future study could be a consideration what future policy instruments could strengthen informal institutions that support sustainable food consumption in a systems level to reduce the reliance of actions on individual action. De Schutter (2019)

suggest that states could encourage empowerment, participation, and accountability in food systems to introduce more food democracy and to involve civil society groups in the design and implementation of food policies in order to support food reform. The research of Benyam et al. (2018) suggested that embedding community perspectives in policy instruments could be valuable, with the aim of encouraging sustainable food consumption and utilization behaviors in regional communities. The respondents in Finland raised similar options to reduce food waste as was found in the study of Benyam et al. (2018). In Finland also, respondents suggested information campaigns and the community collection of leftover food from schools and restaurants to give it to the poor. The suggestions, how to reduce food waste, raised by the respondents highlight the community aspect of taking joint action, which is in line with the previous finding of Røpke (2009). The respondents also recognized the previous finding of De Schutter (2019) that a significant portion of food waste is created *via* the practices of supermarkets and food manufacturers for example due to too large packaging or less reasonably priced options for different sizes of packaging and Saarinen et al. (2019) have found that (only) a third of food loss in Finland is created within households. Local policies and governance should thus enable and facilitate activities to help reduce food loss and waste where their creation is initiated.

Relevant to sustainability could thus be the support of institution building by enabling collective action to support the creation of local agency toward sustainable food consumption options (see also Garnett et al., 2015; Baker et al., 2021). This research has shown that especially rural residents value locally produced vegetables and other food stuff. Many rural residents highlighted that they do not produce food waste because they compost any leftovers. The survey responses confirmed the previous finding of FAO (2011) that fruits and vegetables are the items that most often are wasted. This calls for higher quality products, better packaging, transport and storage, which is a recommendation that extends beyond the national context. Shorter routes from the field to the table could increase the quality of the end-product and provide sustainability improvements through increased resource efficiency. In line of this thinking, for example food cooperatives in many countries already provide options for more sustainable production and consumption, hence what could be the instrument to further support such development? Could one be allowed a deduction in the yearly income tax, if one had supported the local organic food cooperative by buying their vegetables (similarly to having a tax deduction in the yearly income tax for buying services for various kinds of work at home etc.)? De Schutter (2019) highlights that as the problem of sustainable food reform is systemic and therefore the solutions should also be systemic.

There are several limitations to this study. As the aim of this study has not been to examine the GHG emissions and the potential of various policy measures in actual GHG emission reductions it is not possible to make conclusions about the size of the impact of food policies on GHG emissions in the considered areas. This could be a subject of future study. As the statistical analysis showed, in general, the impact of the policies on behavior seems to be rather low. This would call for more efficient policies

that really target behavior change. The open answers to the survey give some indication how this might be reached: introducing financial instruments, information dissemination, easiness of options and support on local food production.

Another limitation to this study is caused by the fact that the survey was not designed to be very informative in terms of background of the respondents. The survey data was not designed nor collected for this research setting or research questions, so the fit of data is not optimal to this consideration. There is little information on the background of the respondents so their influence on the responses cannot be evaluated. Therefore, the results of this study need to be treated as very initial and exploratory, and conclusions drawn suggestive. The examination of the responses to the open-ended question nevertheless increases the reliability of the conclusions and bring forth more understanding on the views and contexts of the respondents to complement the statistical analysis.

A further limitation in this examination is that there is a long list of policy measures targeting change in consumption (see Grubb et al., 2020), but the survey examined only a few of them and in a rather general manner. For example, organic food was not considered in the survey, although it has sustainability implications in terms of GHG emissions. Little can thus be said about the overall efficiency of Finnish policies targeting sustainable food consumption. Nevertheless, the survey revealed some differences in views of respondents in different areas and as such provides important insights that can be used as guidance in future policy making and warrant a consideration of spatially differentiated food policies.

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DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/**Supplementary Materials**, further inquiries can be directed to the corresponding author.

AUTHOR CONTRIBUTIONS

The author confirms being the sole contributor of this work and has approved it for publication.

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SUPPLEMENTARY MATERIAL

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