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Why do people accept or reject climate policies targeting food consumption? Unpacking justifications in the public debate in online social forums

Anna Bendz [a,*], Felix Bäckstedt [a], Niklas Harring [a], U. Martin Persson [b]

[a] Centre for Collective Action Research, Department of Political Science, University of Gothenburg, Sweden
[b] Department of Space, Earth and Environment, Physical Resource Theory, Chalmers University of Technology, Sweden

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ABSTRACT

A shift in dietary habits will be required to meet global climate targets. However, from a social dilemma perspective, major voluntary shifts in diet patterns are unlikely. Hence, government interventions are called for. This may be a perilous political endeavor, since food habits and choices are assumed to be personal and contentious matters and any food regulation policy risks stepping over the line for what people accept, risking policy legitimacy. In order to construct feasible policy measures, it is therefore important to gain knowledge of the prerequisites for support of climate food regulations and to understand why people accept or oppose regulations. The aim of this paper is to do so by analyzing the public debate concerning *meat-free days in school canteens* and *a tax on meat* in two public online social forums in Sweden. We seek to 1) map the arguments supporting (non)acceptability of the two food consumption regulation issues and 2) analyze what policy-specific and factual beliefs are reflected in the arguments and then detangle their meaning and content as revealed in the arguments. We find that policy-specific beliefs around freedom, fairness, and effectiveness are commonly used in support of or objection to these policies, but to different degrees, and often linked to factual beliefs about consequences for health or disadvantaged social groups. We conclude that the general reluctance of policy makers to interfere with what people eat is not necessarily well founded, and that better policy design, framing, and communication have the potential to increase policy support.

1. Introduction

Our food systems are a major driver of global environmental change, accounting for a third of anthropogenic greenhouse gas emissions (Crippa et al. 2021), a third of terrestrial acidification, and almost four-fifths of eutrophication globally (Poore & Nemecek 2018). Through agriculture-driven deforestation (Pendrill et al. 2022) and over-harvesting of marine resources, food systems are also the major driver of biodiversity loss globally, both on land and in the sea (IPBES 2019). If we are to reach the global environmental targets we have agreed upon internationally—e.g., through the UN conventions on climate change and biological diversity—global systems are in urgent need of a sustainability transition (Hoek et al. 2021).

For a global transition in food systems to materialize, however, we will need a wide range of policy interventions supporting technical and behavioral changes across food supply chains, from producers to consumers (Moberg et al. 2021; Willett et al. 2019). This is true not least for diet changes—in particular a shift from meat to plant-based food—which, in addition to having substantial health co-benefits, are required for keeping global food systems within environmental limits (Bajželj et al. 2014; Springmann et al. 2018; Willett et al. 2019). The need for a shift to healthy and sustainable diets is also recognized in recent policy documents, like the EU Farm to Fork Strategy (European Commission 2020), or the new Nordic Nutrition Recommendations (Blomhoff et al. 2023) that calls for diets with less meat and more plant-based foods.

Diet changes can be understood as a collective action problem, where food choice comes with benefits for the individual (e.g., finding meat tasty and wholesome), while the aggregated costs of meat consumption for the environment are collectively shared. Overcoming large-scale, complex, collective action problems such as that of environmentally

* Corresponding author.
E-mail addresses: Anna.Bendz@pol.gu.se (A. Bendz), Felix.Backstedt@gu.se (F. Bäckstedt), Niklas.Harring@pol.gu.se (N. Harring), Martin.Persson@chalmers.se (U. Martin Persson).

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destructive diets, which involve a huge number of actors who are anonymous to each other, requires coordination by governments (Olson 1965; Ostrom 1998; Jagers et al. 2020), since (most) people will not decide to act against their (perceived) short-term self-interest unless they can be certain others, too, will do so.

At the same time, trying to implement policies aiming to change what people eat can be a perilous political endeavor, since food habits are highly personal and contentious matters, closely linked to identity and culture, often seen as a private concern (Kildal & Syse 2017). The previously mentioned changes in the Nordic Nutrition Recommendations were met with strong opposition from industry groups and politicians, as were similar proposals for changes to the US dietary guidelines (Freidberg 2016). Thus, while there is a growing literature on policies for more sustainable food consumption (Garnett et al. 2015; Röös et al. 2021)—ranging from regulatory (e.g., menu restrictions) to market- (e.g., meat taxes) and information-based (e.g., labeling) interventions—there is a need to understand the factors affecting the acceptability and legitimacy of these types of policies among the general public. Failure to understand the factors affecting public acceptance may lead to policies that are perceived as illegitimate—due to poor design or justification—resulting in public opposition or lack of compliance.

However, despite a growing literature on public acceptability of climate policies or policy instruments in the area of energy and transport (Bergquist et al. 2022; Drews & van den Bergh; 2015, Ejelöv & Nilsson, 2020), as well as on food policy for more healthy eating (Cadario and Chandon, 2019; Fatemi et al., 2021; Hagmann et al., 2018), comparatively little attention has been paid to policies for more environmentally or climate-friendly food consumption (see Fesenfeld et al. 2020 for an exception). Hence, our overarching aim in this paper is to contribute to an improved understanding of the acceptability of interventions for more climate-friendly eating. We do so by assessing attitudes to two interventions that have led to public debate in our case of study, Sweden: *meat-free days in school canteens* and a *tax on meat.* These are interesting to analyze due to the intense debate they have spurred, but also since they are examples of different kinds of policy interventions: one being a market based-instrument (*a tax on meat*) and the other a quantity-based regulatory intervention (*meat-free days in school canteens*).

A recent *meta*-study of public support for climate taxes and laws finds that the most important determinants are perceptions concerning the consequences of a policy instrument in terms of its fairness implication and its effectiveness (Bergquist et al. 2022). These perceptions, together with perceptions of the consequences of policy instruments for individual freedom, are sometimes in the climate policy literature called *policy-specific beliefs* (PSBs) (Eriksson et al., 2006, 2008). However, apart from studies finding stronger effects for *distributional* fairness than *personal* fairness (whether a policy is perceived to be fair "for me") (Maestre-Andrés et al. 2019), the PSB literature seldom goes beyond the broad concepts of fairness, effectiveness, and freedom (Povitkina et al. 2021 is an exception). Hence, we know little about what kind of idea or conceptualization of, for example fairness, respondents have in mind, and we know even less about potential interlinkages between different PSBs.

In this study we aim to further our understanding of these concepts in relation to policy interventions for more sustainable food consumption, and in doing so contribute to a broader literature on environmental and climate policy support. To this end, we analyze *authentic responses* to social media posters in two influential (in terms of the fairly large number of posters and members) public online social forums in Sweden (*Flashback.org* and *Familjeliv.se*). Previous findings on the acceptance of climate policy have to a large extent been based on survey studies using closed-ended questions. Through an open-ended, inductive approach to social media posts, we are able to identify, categorize, and understand interlinkages between justifications linked to the acceptance or rejection of policies for more sustainable diets, as well as identify other kinds of beliefs than those investigated in survey studies, potentially uncovering new factors affecting policy acceptance. One preconception that our study builds on is that these PSBs are linked to other beliefs, not least beliefs about other actors (i.e., trust) and factual beliefs (i.e., truth claims) (cf. Povitkina et al. 2021). Hence, we are interested in answering which justifications are used in support for, or opposition to, *a tax on meat* and *meat-free days in school canteens* and ask:

(1) How are policy-specific beliefs expressed by those who post; i.e., how are beliefs about freedom, fairness, and effectiveness manifested in relation to these policy interventions?

(2) What other beliefs are expressed in support or opposition to these policy interventions, including beliefs about others (trust) and factual beliefs (truth claims)?

We mainly take a qualitative approach to assessing beliefs underlying policy attitudes. Thus, our analysis is explorative and open, with the arguments people use being inductively inferred. This allows us to identify other kinds of beliefs than those investigated in survey studies, potentially uncovering new factors affecting policy acceptance. Also, by mapping the arguments and putting them in the context of the discussions of the online social forums, we are able to disentangle the different aspects of beliefs that have been proven to be underlying determinants of acceptance in earlier research. By qualitatively analyzing the arguments, we will for example be able to scrutinize what people actually mean when they express that a policy is unfair, and we will be able to identify links between factual beliefs (e.g., meat is a necessary component of a healthy diet) and beliefs about whether a policy is unfair or not.

The article continues with the theoretical framework and presentation of the model, followed by a section on method and presentation of the cases. Thereafter, the results from the empirical study are presented, followed by conclusions and discussion.

2. Framework

2.1. Policy attitudes

In our study we focus on *attitudes* to policies or policy instruments for more environmentally or climate-friendly food consumption, and we follow Eagly and Chaiken's (1993, p. 1) definition of an attitude as "a psychological tendency that is expressed by evaluating a particular entity with some degree of favor or disfavor." Hence, we study whether people like or dislike certain political proposals and the justification they provide for their position. We acknowledge that these statements, posted in online forums to be read by others, also can be seen as arguments to convince people, but analytically we understand them as indicative of factors explaining people's policy positions.

With the ambition to account for how beliefs are linked to these statements, we account for three types of beliefs that previous literature has identified as relevant: policy-specific beliefs, factual beliefs, and beliefs about other actors.

2.2. Policy-specific beliefs

Policy-specific beliefs refer to perceptions about the consequences of a policy measure, or more specifically how individuals understand the positive or negative consequences of a policy (Eriksson et al., 2006, 2008) in terms of for example perceived consequences for *fairness*, whether it is *effective* in solving the problem, and whether it implies consequences for *freedom.*

2.2.1. Fairness

Beliefs about fairness consequences are found to be the most important determinant of (climate) policy support (Bergquist et al. 2022). However, the concept of fairness is seldom further scrutinized as such in studies assessing the acceptability of climate policy. Hence, we do not know what kind of idea or conceptualization of fairness these respondents are thinking about.

In a rare attempt to actually disentangle the concept of fairness and how it is linked to people's attitudes to carbon taxes in the US, Povitkina et al (2021) find that people have several arguments for why they consider the policy fair or unfair. For example, people perceive the policy as unfair because of the *need* to drive, or they perceive that it unfair because it *affects the poor* or rural population, or that the *purpose* of the tax is unjustified. The present study illustrates the importance of being more specific and nuanced when analyzing fairness beliefs, since these beliefs may manifest in many different ways.

Our study will capture a broad range of aspects, thereby expanding on the results from survey-based research using pre-determined categories. Reviewing the literature on the role of fairness beliefs and public acceptability of carbon pricing, Maestre-Andrés et al. (2019) model different dimensions: personal (consequences "for me"; see Bergquist et al. 2022), distributional (allocation of costs and benefits), and procedural (how were decisions made on a particular matter), where people's beliefs about whether a policy is fair or not can be based on one of these dimensions or a combination of several of them.

2.2.2. Effectiveness

Perceived effectiveness is most often referred to as the degree to which one believes that the policy will be able to solve a collective and/or individual problem. Schade and Schlag (2003) also suggest that efficiency is another dimension of effectiveness, referring to a cost-benefit perception vis-á-vis other alternatives. Perceived effectiveness has been demonstrated to be linked to acceptability when it comes to for example transport and energy policies (e.g., Schade & Schlag 2003).

2.2.3. Freedom

Perceived freedom is often referred to as (infringement on) personal autonomy, i.e. a restraint on individual choice, and it is generally negatively related to acceptability (Ejelöv & Nilsson 2020). As demonstrated by Guo et al. (2021), in a recent study concerning drivers of support for regulations to reduce nutrient pollution, beliefs about the right to autonomy for farmers is directly linked to policy support. Thus, just as for fairness, the general factor freedom might also reflect very different concerns regarding whose freedom is infringed on by a policy (or not).

2.3. Beliefs about other actors

Studies have demonstrated that trust in other actors is important for environmental policy acceptance. Vertical trust in institutions implementing policies has for example been proven to be of importance for acceptance of CO_2 taxes (Hammar & Jagers 2006), where people are more supportive of policies if they trust the actors implementing them (Davidovic & Harring, 2022; Fairbrother et al 2019). Research also suggests that horizontal trust in other people is of importance, since policy interventions often rely on citizens' willingness to cooperate, and if there is low trust in other people's willingness to cooperate, few will comply (Harring 2016; Smith & Mayer 2018).

2.4. Factual beliefs

Furthermore, research has shown that beliefs about climate change, or "climate change evaluations" (Bergquist et al. 2022), matter for climate policy acceptance. From previous research on sustainable food policy, we know that policies on food and diets are contentious and multifaceted (Freidberg 2016) and linked to beliefs about health, food security, and animal welfare (Kwasny, Dobernig & Riefler, 2022). Therefore, we expect that such *factual beliefs*, as we have chosen to call them, will play a role in policy attitude formation.

2.5. Unpacking beliefs

2.5.1. Consequences for whom or what?

When understanding and unpacking these beliefs, we need to acknowledge that they are multifaceted concepts. For example, in forming perceptions about the (distributional) fairness consequences of a policy instrument, individuals will identify or highlight the relevant groups or groups among which a good (or bad) should be distributed. For example, when someone argues that a policy is unfair, it can be unfair, e.g., for themselves, specific groups (such as school-aged children or poor families), or nature. Similarly, in unpacking factual beliefs, individuals may think of consequences for certain groups regarding the links between for example a certain diet and health. Hence, *consequences for whom (people) or what (*e.g. *nature, animals)* will be a prism/analytical tool through which we will analyze (or categorize) the justifications.

2.5.2. Interlinkages between policy-specific beliefs

Another important point of departure in the unpacking exercise is to acknowledge that these beliefs are interlinked. As pointed out by Ejelöv and Nilsson, "the more a policy is perceived to infringe on individual freedom, the less fair it is also perceived" and "perceived fairness itself is also positively related to the perceived effectiveness of a policy" (2020:6). Given the dominant survey approach to environmental citizen policy attitude studies and subsequent deductive operationalizations of policy-specific beliefs, questions arise as to whether and how these are actually overlapping, or just a result of lacking clear distinct definitions. Moreover, survey questions tend to embody a unidimensional assumption of policy-specific beliefs, worded often along the lines of "how effective do you perceive this policy to be?" Such a measure may not adequately capture citizen reasoning as beliefs may look very different depending on being for or against a policy. In other words, it is reasonable to ask: How well do the theoretical constructs reflect citizen constructs? Such disparities may have both analytical and validity implications and are something our approach may be better at deciphering.

2.5.3. The model—beliefs determining sustainable food policy attitudes

We are interested in understanding how policy-specific beliefs are linked to policy acceptance and rejection, but also in understanding how policy-specific beliefs are linked to beliefs about other actors and factual beliefs, and how the interlinkages between these beliefs play a role in attitude formation. Furthermore, in our unpacking exercise we investigate how *consequences for whom* matters in the link between beliefs and attitudes (see Fig. 1).

Our point of departure is that certain beliefs shape attitudes (indicated by the arrows and links in Fig. 1). That said, we do not make any causal claims regarding cognitive processes shaping attitudes. For example, we acknowledge that people can rationalize if they feel that their (self-centered) choice of diet is questioned (or threatened) and search for other (more publicly acceptable) justifications to their policy position. Hence, policy position can shape beliefs about the policy. However, what we can do is identify the linkages.

Furthermore, even though we focus on policy-specific beliefs, we are inductive in the sense that we also open up for including other potential factors (see Fig. 1). On that note, it is important to highlight that we are not able to investigate the role of socio-demographic factors, such as level of education, income level, or gender, as those who post are anonymous. However, we know from previous literature that, apart from level of education, these socio-demographic factors often have small to insignificant effects on climate policy attitudes (Bergquist et al. 2022). Furthermore, we cannot say anything about how more abstract concepts such as value positions or ideology form certain beliefs.

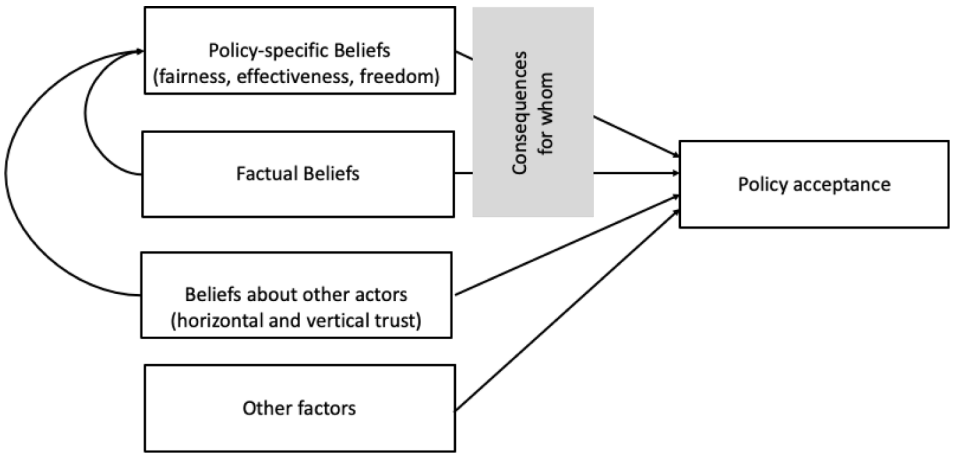

Fig. 1. The theoretical model, conceptualizing how different beliefs interact in shaping people's acceptance of policies for more sustainable food consumption (see text for details).

3. Method and data

In this section, we discuss social media as data and describe the cases. We also present the method of analysis.

3.1. Social media analysis

The advent of social media not only enabled and facilitated large-scale communication exchange, it has also claimed the title as the primary domain where public opinion is voiced today. Not surprisingly, business analysts, political organizations, and researchers alike have taken advantage of these new arenas to advance the study and understanding of individual and collective attitudes (Ribeiro et al. 2016).

However, social media research has been questioned in relation to if online expressions actually reflect public opinion. Criticism usually contests the general representativity of social media content, as users tend to be (or at least used to be) early adopters, younger, and/or better educated (Skoric et al. 2020). Such critique contrasts the degree to which social media analysis compares with traditional interview and survey methods' sampling strategies of representativity.

The type of critique outlined above makes an implicit mistake concerning the relation between individual and collective attitudes, i.e., that those who do not voice their opinion online have distinct and isolated views. It also assumes that everyone's opinion carries equal weight, where the public opinion is merely a sum of individual attitudes. But as pointed out by Skoric and colleagues, dismissing social media on such grounds misses the dynamics of opinion formation: "As opinions held and debates conducted by certain politically active groups pre-empt those that develop in broader society, it is likely that social media conversations by active users play a stronger role in shaping public opinion" (2020:3).

Moreover, social media research has a unique advantage when mapping citizen attitudes. Inferring public opinion through querying respondents on their political attitudes can have its limitations. As noted for example by Berinsky (1999), it is not uncommon that respondents will hide socially unaccepted opinions behind a "don't know" answer. Social desirability bias has been identified to shape respondent answers in sustainable food research (Cerri et al. 2019), and the field of environmental psychology (Vesely & Klöckner 2020). Since social media posting is a voluntary action, and its analysis is purely observational, we believe that social desirability bias is less of a problem. In sum, as social media (1) is the primary arena for public debate, (2) mimics rather well how public opinion is shaped and diffused, and (3) represents a more pure and closer expression of attitudes, it provides promising grounds for the purpose of this study.

3.2. The cases

The point of departure for our selection of interventions were, first, that a meat tax and meat-free days in schools have been the focus of a comparatively extensive public debate following policy initiatives (see further below), and second, that they differ in character. As mentioned in the introduction, a meat tax is a market-based instrument and although not implemented in Sweden, it has been brought up as a way to change consumption behavior and it has also been suggested by some political decision makers and other actors. Meat-free days in schools is a regulatory intervention that has been implemented in several Swedish municipalities. In Sweden, municipal decision makers are responsible for schools, which makes this issue a local rather than a national concern.[1] There are no official data on how many municipal schools in Sweden offer meat-free days, but according to a report from a commercial actor, about 60 % of them currently do (Orkla 2021). In selecting interventions, we also tried to find "information-based" measures like climate certification in regards to food but the public debate was very limited and therefore this kind of intervention was excluded (see Fig. 2).

The analysis was carried out on two different types of threads across two different Swedish internet social network forums: *Flashback.org* and *Familjeliv.se*. Both forums have been in broad public use since the early 2000 s. Flashback is an open forum for discussions about a broad range of topics (e.g., sports, culture, and politics), and it is one of the most frequently visited websites with 1.6–2.2 million visitors per week in 2010 (https://sv.wikipedia.org/wiki/Flashback_Forum). Familjeliv is an open forum where the focus is on discussions concerning family life, but like Flashback, a wide range of subjects are discussed (https://sv.wikipedia.org/wiki/Familjeliv). In 2016, this forum had about 1.1 million visitors per week (https://sv.wikipedia.org/wiki/Flashback_Forum). Of Swedish internet users, 24 % used Flashback in 2021, down slightly from 33 % in 2018 when percentages were first measured. About 6 % used Familjeliv in 2021 (no earlier available measure). For both forums, people born in the 1980 s are the most frequent users (Swedish Internet Foundation 2021 and 2018). On both forums, individuals are free to express opinions and share them as long as the rules (e.g., to not advertise for commercial purposes, not instigate criminal activities, and not express racism) are followed. Only members can create posts and applying for membership is a quick process.

Since these forums are veiled by anonymity, demographic

[1] The local politicians cannot make decisions concerning school canteens for independent, non-municipal schools. The number of such schools varies across municipalities, but there are public schools in all municipalities.

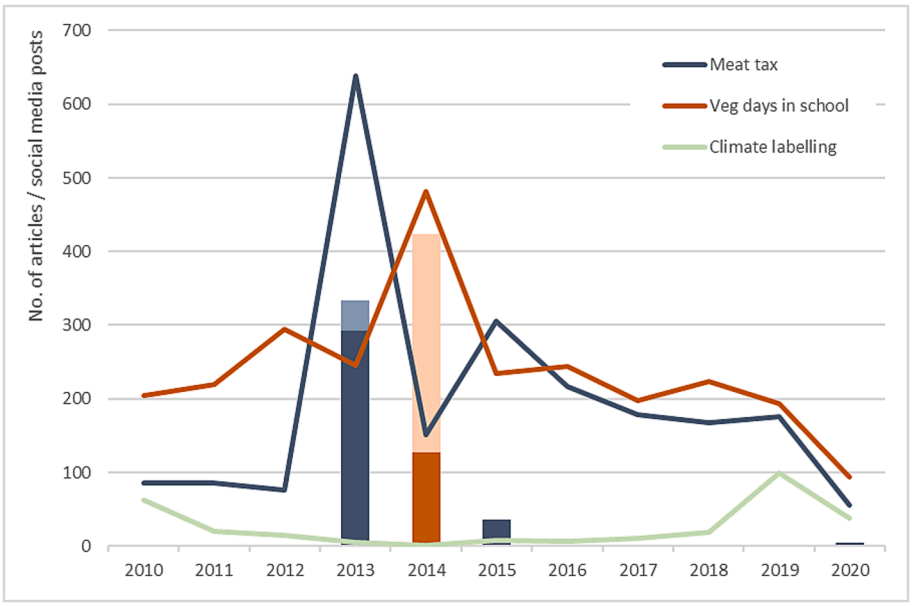

Fig. 2. Prevalence of printed media articles (lines) and social media posts (bars) on three different policy interventions for reducing the climate impact of Swedish food consumption: a tax on meat, vegetarian days in school canteens, and (mandatory) climate labeling of food products. Triggering events for the former two in 2013 and 2014, respectively, led to posts in two social media forums—Flashback (dark shaded bars) and Familjeliv (light shaded bars)—which constitute the primary data for our analysis (see text for details). The collection of data on printed media articles was made by a search based on relevant keywords in Retriever Research, years 2010–2020.

information on the user base is scarce, especially on who has posted in the analyzed threads. But according to the Swedish Internet Foundation (2018), around 60 % of Flashback users are male, and the predominant age category is 26–35 years. Self-reported statistics from Familjeliv (2014) state that their members consist of 80 % women, and the average user is 29.5 years old. The age profile implies that the material is biased when it comes to age, where we cannot be sure that people older or younger than the typical forum member would have the same attitude or use the same arguments. Arguably, some arguments in the posts are related to the poster's current life situation, such as being a parent of school-aged children.

Both forums have policies encouraging and guaranteeing anonymity. This is a favorable feature for the study of attitudes (Cerri et al. 2019). As addressed above, social media may better enable and facilitate the expression of unpopular opinions by circumventing social self-moderation. An anonymous forum arguably does this even better than a site like Facebook, Instagram or Twitter for instance, where most profiles represent the actual person or organization behind it. A caveat with the anonymity is that posters may be untruthful about their identity and that "trolling" may occur (Blomberg & Stier 2019).

We chose discussion threads concerning a meat tax and meat-free days in school canteens by departing from certain "triggers" in the public debate, as previously identified in one of the authors' study of media content over time (see Fig. 2). When it comes to a meat tax, a debate followed a report in January 2013 from the Swedish Board of Agriculture, which tentatively suggested a tax on meat in order to promote a sustainable and climate-friendly food consumption. A discussion thread was started on Flashback on January 22, 2013, and went on until the end of the month, with in total 292 posts. The thread was picked up again in February 2015, with 36 posts and then again in 2020 with four posts. In total, 333 posts were included in the analysis. On the same initial day as on Flashback, a discussion was started on Familjeliv concerning the same report. Here, 42 posts were posted during January 2013.

For the case of *vegetarian days in school canteens*, we similarly chose discussions following a trigger. This time, it concerned an event organized by the Federation of Swedish Farmers, where they protested against the implementation of a meat-free day at a school by standing outside the school, offering students hamburgers. The discussion thread on Flashback started on January 29, 2014, and yielded 127 posts up until its last post 9th of february 2014. On Familjeliv, we found a thread on the same subject starting at the same time, although the initiator of the discussion did not explicitly refer to the above mentioned event. This discussion contains 296 posts, mainly from 9th of February to 1st of March 2014 when the discussion was most active. The thread saw some activity later again with 25 of the posts being made between 15th and 16th of July 2014.

The responsible administrators of the social forums regularly merge threads that are similar, which means that discussions concerning a meat tax and vegetarian days in school canteens that were started separately have been merged into one main thread although it cannot be ruled out that some posts were not included in the merge. However, we believe that we have found the main parts of the discussions concerning the two issues.

A substantial number of posts (n = 494) were excluded from the analysis, since they did not explicitly express (non–)acceptability of the policy or were not relevant for our study for some other reason (e.g., that the poster provided facts from reports, but no opinions). As can be seen in Table 1, the meat tax generated more discussions on Flashback while meat-free days in school generated less interest, while the opposite was true for Familjeliv. In total, our material consists of 302 posts.

Most of the posts identified in our data material are by now almost ten years old. Despite the limitations this implies in generalizing our findings—as both policy-specific and factual beliefs may change over space and time—-we think that future research—both in Sweden and in other countries—can be helped by our analytical framework and design. In particular this is relevant as political pressure is rising to make our food systems more sustainable.

Table 1
Number of coded posts, by policy *and social media forum.*

	Flashback	Familjeliv
Meat tax	112	16
Vegetarian day	40	134

3.3. Coding and analysis

The framework we used for coding the arguments in the social forums was developed from previous research and theory, but we also adapted and modified the framework to what was revealed when we analyzed the data. As mentioned, previous research has been mainly quantitative, and the factors used in those studies did not capture all factors that we have found to be relevant for understanding acceptability. Therefore, we chose an abductive approach, constructing the framework as a dialogue between theory and data, in order to both build on previous research and to contribute with a complement to it.

Each post was first coded as either positive or negative to the food consumption policy intervention in question. Positive is interpreted as acceptability of the intervention, while negative means non-acceptability. In coding and analyzing the material, we then focused on three kinds of beliefs discussed above: Policy-specific beliefs, factual beliefs, and beliefs about other actors (trust). The beliefs are expressed as justifications for or against the policy interventions in the posts.

As mentioned above, policy-specific beliefs (freedom, effectiveness, fairness) refer to beliefs about the consequences of a policy (or a proposed regulation/policy). If the consequences are perceived as negative, it is less likely that citizens support the policy and adjust their behavior if implemented. In order to qualify the analysis of the PSBs, we also code the posters' perceptions of "consequences for whom or what," i.e., beliefs about consequences of the policy for individuals as well as for "others" (see Kallbekken et al. 2013), such as particular groups, the environment, animals, and other relevant categories. This refers to perceptions about who/what would benefit or be disadvantaged from the policy. Here, we used some categories defined beforehand, but we also added categories when they showed up in the material in order not to miss out on important beliefs. There is sometimes a confusion about whether a certain policy or behavior will have consequences for the climate or the environment or both. However, we include both posts that focus on climate and environment in general.

Since arguments often build on particular beliefs about facts, we included factual beliefs, conceptualized as "truth claims," to capture what beliefs about reality underpin acceptability or non-acceptability. In some cases, such factual beliefs can be related to consequences (for example, if one thinks that meat is necessary for a healthy life, then a policy aimed to reduce meat consumption will be perceived as having negative consequences for humans). Here, the categorization was data driven and added to the framework as we went along with the analysis of the posts. As it turned out, most of the factual beliefs were repeated several times in the posts. For the analysis, similar categories were merged.

Finally—regarding beliefs about other actors—since trust has proven to be important for policy acceptance, we include horizontal and vertical (dis)trust in order to find out what role this plays in justifications for or against a food consumption regulation. For example, it may be the case that a general distrust in politicians contributes to a skepticism toward steering instruments.

In Table 2, we describe how the beliefs are coded in the material according to criteria that are for some categories deduced from theoretical concepts. For others, the coding is continuous in that we create new codes as factual beliefs, and to some extent consequential beliefs, show up in the posts. In analyzing the material, we have carefully read the posts and attached codes to each post. Each post was coded with one or several codes, denoting categories. We used the Atlas.ti software in order to organize the material as well as for coding and analysis. The software makes it possible to for example analyze what codes occur together, and then refer this to particular quotes.

The analysis was executed in two steps. In the first part of the analysis, we aim to give a broad overview of the material, addressing the question of which justifications are used in support of, or opposition to, a *tax on meat* and *meat-free days in school canteens*. Here, we relate attitudes to the two food regulation policies to beliefs in order to discern what justifies acceptability and non-acceptability. For the most part, it was quite evident if the poster was for or against the policy. In some cases, it was not entirely clear, for example when posters expressed that they were positive conditional on some conditions being fulfilled. This was still coded as positive. Since the unit of analysis here is *posts* rather than *users*, this has guided the coding procedure.[2] This means that posts that belong to a discussion between users have not been coded as positive/negative if they do not explicitly express (non)support, even if the user did so in a prior post.

Second, we turn to the policy-specific beliefs that previous research has demonstrated to be of importance, i.e., beliefs concerning freedom, effectiveness, and fairness. We analyze the posts from the perspective of how the PSBs relate to each other and to beliefs about consequences, factual beliefs, and trust, in the justifications expressed for or against the policy interventions. Here, we closely analyze the content of the posts in order to disentangle the justifications and how they relate to each other. Only posts referring to policy-specific beliefs (a large majority) were included in this part of the analysis (please see appendix, Tables A1 and

Table 2
Scheme used for the coding of social forum posts.

Beliefs	Categories and criteria for coding
Attitudes to food regulation policy	*Positive/negative.* Positive if posters express support of the policy. Either directly (e.g., that vegetarian days in school canteens is a good suggestion) or indirectly (e.g. believing meat becoming more costly is a good thing)0.[8] Negative if posters express non-support of the policy. Either directly (e.g., that a tax on meat is a bad suggestion) or indirectly (e.g., that authorities "imposing food habits from above" is wrong).
Policy-specific beliefs	*Freedom, fairness, effectiveness.* Freedom: Posters refer to consequences for (personal) freedom or autonomy (e.g., questioning why the state should "force young people to eat vegetarian food"). Fairness: Posters refer to consequences for fairness (e.g., that it is unfair that people should pay more for meat when it is already expensive). Effectiveness: Posters refer to consequences for effectiveness (e.g., that a higher price on meat would decrease consumption).
Beliefs about consequences	*Pre-determined categories (consequences for self, other people, and other things) and continuous coding (adding new categories during the coding process).* Posters expressing beliefs about whether the policy has consequences for someone (e.g., that vegetarian days in school canteens would mean that children get too little protein) or something (e.g., that a meat tax would have positive consequences for the climate).
Factual Beliefs	*Continuous coding (adding categories as they showed up in the posts).* Posters expressing a belief about the way things are, a "truth claim" (e.g., that eating too much meat is harmful to the climate).
Trust	*Horizontal/Vertical* Horizontal trust: Posters expressing trust or distrust in fellow citizens (e.g., that vegans or vegetarians are "extremists"). Vertical trust: Posters expressing trust or distrust in authorities or the government/politicians in general (e.g., that politicians do not think about what is good for the people).

[8] This category also includes posts that express support but with a condition, e.g., expressing support of the general idea of a tax, but that domestic production should be spared.

[2] The number of unique posters expressing (non)acceptability behind the posts varies. For the thread on meat free days on Flashback, the share is 45 percent, for the thread on meat free days on Familjeliv, the share is 57 percent. For the thread on Meat tax on Flashback the share is 58 percent and for the thread on Meat tax on Familjeliv the share is 80 percent.

A2, for PSB distributions across positive/negative sentiments)

Running intercoder agreement analysis of the first part of the analysis yielded a Krippendorff's score of 0.938. Analyzing the second step showed there were sizeable disagreements between the coders' original decisions. These disagreements were resolved by joint discussions of each conflicting case and adjusting the codes accordingly. Thus, the results rests on a solid and thoroughly checked coding. For a more detailed description of the process, see the appendix.

4. Results

The results section is structured as follows: First, we present results concerning the justifications of acceptability and non-acceptability of the two policy interventions. Second, we focus on Policy-specific beliefs and how they are manifested in the posts, using quotes to illustrate.

4.1. Justifications of acceptability and non-acceptability of policy interventions

Of all the posts concerning on meat-free days in school canteens (n = 174), nearly three-fifths were positive to the policy intervention, though this share is substantially higher for posters on Familjeliv (64 %) than on Flashback (40 %). The opposite holds for the meat tax, with just over three-fifths being negative to the proposed policy intervention (shares were equal in both forums).

Fig. 3 gives an overview of what kind of beliefs that are mainly underlying acceptability and non-acceptability of the policy interventions. The figure refers to how policy-specific beliefs, factual beliefs, and trust are associated with positive and negative attitudes to each policy, respectively (numerical results, including details on all types of factual beliefs identified, are found in the appendix Fig. A1). In this part of the analysis, we assess the relative prevalence of different types of factors used to express acceptance/non-acceptance, but do not go into detail concerning how the beliefs are expressed in the posts (this will be done in part two of the analysis, where we show how policy-specific beliefs relate to other types of beliefs).

A first finding from Fig. 3 is that policy-specific beliefs are commonly expressed in the material, but the prevalence of different PSBs depends on both policy type and attitude to policy. Among the posters who are positive to the policies, effectiveness and fairness are used as justifications to a greater extent than among negative posters. Freedom justifications is in particular used by posters negative to meat-free days, where posters for example claim that children should have the freedom to choose to eat meat if they wish to do so. One visible contrast between the

Fig. 3. Relative prevalence of different types of arguments in social media posts positive (top panels) and negative (bottom panels) to meat-free days in school canteens (left panels) and a meat tax (right panels). For factual beliefs, only the two most prevalent sub-classes of arguments are displayed (see Appendix for the full data), with "Meat (pos/neg)" reflecting statements that we eat too much meat in posts classified as positive and a skepticism about the impact of meat consumption on climate change in the negative posts.

two types of policy proposals concerns the difference in frequency of effectiveness-related arguments, where the discussions on a meat tax to a greater extent contain arguments requiring effectiveness in relation to the increasing costs for consumers that would follow from a tax on meat and where positive posters believe that this would decrease consumption, while negative posters express skepticism that this would be the case. Another obvious difference between posters expressing acceptance and non-acceptance of the policies is the prevalence of justification relating to beliefs about others: this factor is almost only present for those opposing the policy, with issues around horizontal and vertical trust being invoked equally.

The most prevalent factual belief used to justify policy attitudes is connected to health/nutrition issues. This is the case for both positive and negative posters. The arguments when it comes to vegetarian days reflect perceptions about what humans/children need in order to live a healthy life. Regarding the nutritional debate on a meat tax, positive posters suggested that cutting down on meat would yield positive health benefits, while skeptics contended that meat is a necessity for sufficient nutritional intake. This seems to contribute to polarization between people—is eating meat necessary for human wellbeing or not?

A second factual belief that is particularly prevalent in the posts on vegetarian days concerns meat and whether it is necessary to cut down on meat consumption or not. The posters with a positive attitude claim that we need to cut down on meat consumption and that it is necessary to do something (to save the climate). In the case of a meat tax, positive users pointed to the effects of meat consumption on the environment or climate, for example related to shipping or raising livestock. Among the negative posters for both policies, climate change skepticism was displayed in references to factual beliefs that meat is not at all bad for the climate, challenging whether meat production actually affects the climate.

Differences in arguments quite often came down to factual beliefs, where posts between active users who have been challenged on their position tended to culminate into an exchange of facts. The reversed pattern was observed among sceptics.

4.2. Unpacking policy-specific beliefs

4.2.1. PSB:s and consequential beliefs

We start the analysis by unpacking the meaning of freedom, fairness, and effectiveness by relating them to who or what posters believe are affected by consequences (see Fig. 1, Appendix). There is somewhat of a difference between the two policies regarding whose interests are emphasized in relation to the general PSB:s. For meat-free days in schools, freedom and fairness in relation to one's children is a key concern, while in the meat tax case fairness and effectiveness concerns in relation to farmers and low-income groups dominates. Climate consequences also stand out as being importantly tied to fairness and effectiveness perceptions for both policies.

In the next section, we move on to an in-depth analysis of how consequential beliefs, factual beliefs, and trust are associated with the PSBs, by analyzing justifications within each PSB category (freedom, fairness, and effectiveness). As we also want to draw conclusions about connections to acceptability, we compare positive and negative posters for each PSB. Here, the analysis is based on qualitative methodology, derived from our systematic reading and coding of each post. We use quotes from the posts in order to illustrate the results.

4.2.2. Freedom

4.2.2.1. Vegetarian days in school canteens. None of the posters who are positive to vegetarian/meat-free days in school canteens relate explicitly to freedom. In contrast, freedom, in particular referring to individual autonomy and freedom of choice, is a common value expressed among posters who are negative to meat-free days. There is a general agreement in this group that the implementation of vegetarian days threatens personal freedom, since children are then not allowed to choose, and some posts also refer to everyone's right to choose what to eat in general. This attitude is often also connected to factual beliefs about nutrition: what humans need, or what children in particular need, to be able to perform well in school. A quote from Flashback illustrates this kind of argumentation quite clearly:

> */…/ Of course I eat meat with every meal. Otherwise, the meal isn't complete. A meat-based diet is what we are genetically constructed to eat. In this diet meat, fish, etc. are included, but not grain, legumes, sugar and everything else in the modern diet that /…/ has created the so-called welfare diseases. Now the environmental totalitarianism has gone too far! Don't touch my food!!! I will eat meat every day, to the day I die. Even if I have to breed animals illegally and in secret. I will provide my children with lunch money (Rikskuponger) for off-campus eating or extra meat, so that they can get access to proper food on the days vegetarian food is served in school. Just as you have the right to not choose meat, I have an equal right to choose meat.*

In the posts that include freedom as a value motivating the negative attitude, we also find a connection to trust, referring to beliefs that some groups (vegetarians) or actors want to force children/people to eat vegetarian food, that they have suspicious motives, or that their arguments are not valid. Some refer to the (Swedish) Green Party and that they have particular interests. Some posters think that there is some kind of ideological quest behind the policy, which the quote below shows:

> *The problem is when the children's food intake is used as a political battering ram. There is a particular political party connected to the talk about meat-free days, where the members get wet dreams from vegetarianism and who would prefer if everyone in the world were vegetarians, and if they got real political power of course would legislate about it. (Familjeliv)*

We also find arguments connecting the right to personal freedom as a value with skepticism based on a factual belief about climate change and the environmental impacts of meat consumption, indicating a belief that there are good reasons not to comply and instead choose for oneself since there is doubt about whether meat is really that harmful to the climate:

> *It feels like you are forced to it [vegetarian food in school] since there is no choice. If I went to school, I would bring a large ham sandwich that day!!!!! /…/ There are several articles about meat and the climate, you should not believe everything you read!!!! (Familjeliv)*

4.2.2.2. Meat tax. Freedom was only referred to by negative posters. The material reflects a perception of liberty as an intrinsic unnegotiable value, which is threatened by state intervention. This perception expresses a desire and the importance for individuals to have the choice of opportunity themselves, independent of any other party. The following quotes illustrate this:

> *I don't believe in a meat tax or forcing people to only eat vegetarian. I don't believe in implementing meatless days either. But I do believe that one should have a varied diet. (Flashback).*

> *And what does it matter if meat causes cancer to an absurdly minimal extent? Should people not have the ability to eat the meat they want without the state intervening? (Flashback).*

These two comments reflect that whether one makes a choice based

on health concerns or not, what is most important is the choice in itself. There is also a connection to (mis)trust, where several claim that this type of policy is an attempt by peers or political elites to restrict their way of living.

Freedom frames also overlap greatly with fairness concerns. But while fairness seems to entail beliefs about outcomes for different groups or actors in a relational way, freedom beliefs are rather focused on individuals and their ability to choose.

4.2.3. Fairness

4.2.3.1. Vegetarian days in school canteens. When it comes to the negative posters, fairness as a value is rarely put forward in the arguments. There is just one quote that is (vaguely) related to fairness: that the food in schools is not meant to consider individuals preferences and should be for everyone equally. In the group expressing acceptance of meat-free days in school, our material displays two main types of argumentation when it comes to fairness. First, some posters are positive to meat-free days in school, holding that people in Sweden eat much more meat than people elsewhere and that this affects other people and the earth negatively. This line of reasoning is illustrated in a quote from Familjeliv:

> *Yes, food is a luxury good. In any case meat. We will never be able to provide for the entire population on earth if everyone eats like us, tons of meat. Meat production requires enormous amounts of resources and supplant for example rain forest. If food is to be something for everyone, not a luxury, then we need to act responsibly with the resources we have and eat more vegetables and less meat. (Familjeliv)*

Second, some posters support the policy because of fairness relating to students/children. They believe that everyone (students) should get to choose their food, not just those eating meat. In the quote below, the poster expresses a positive attitude to meat-free days in school and refers to positive consequences for health and the environment, but also to that it would be fairer if everyone could choose their food every day, not just meat-eaters.

> *I think it's a great idea with meat-free days in preschool and school. It's good for the environment, good for the climate, and it's a good way to create healthy and environmentally friendly habits with children. I'm absolutely flabbergasted over the protests that meat-free days generate in some municipalities. I really can't understand why it should be a human right to eat meat in school every day. The argument concerning freedom of choice is silly. Why is it that important to be able to choose meat every day? In that case, it should be possible to choose pasta every day, or potatoes, or rice, or pancakes or tacos or whatever every day. Why meat? (Familjeliv)*

Some also express a factual belief that vegetarian food is as nutritious as meat, and that an important thing is that everyone, including those not getting a proper meal at home, gets tasty and nutritious food.

4.2.3.2. Meat tax. Among those expressing acceptability of a meat tax, attention was brought to the commodity itself by either claiming that meat is not a necessity (or that it is a luxury), or that meat is relatively cheap. This is often connected with pointing out the undesired consequences of meat for either the climate or individual health as a justification of taxation.

A second strand is justification or acceptance of the current (political) system. Answering why the state should dictate one's food choices, some argue that this phenomenon is not something new because taxes have always been around, and it is the reason we can enjoy a modern welfare society.

> *…I'm generally not for high taxes. I'd prefer to see all income tax gone. But that being said: directly environmentally harmful activities or activities hazardous to people's health should be taxed to cover the costs they bring about for individuals, society, the state, and the planet—as long as our society is organized the way it is today. (Flashback)*

> *We live in a society where our welfare services are tax funded. Practically every commodity is subject to some kind of tax. Food, especially meat, has a series of consequences for health, people, and the environment, thus it can be good to tax different foods differently. (Flashback)*

> *Politicians already dictate what we put on our plates, and meat has a relatively low price. While all other products have become more expensive in the last 20 years, meat has become relatively cheaper. Thus, it should only make sense to correct this serious problem.(Flashback)*

There were also some who argued that, despite how effective the tax would be, it is necessary to do at least something to deal with the environmental situation. There were also those who expressed acceptance but with reservations. These accounts acknowledged that the perceived goal was desirable but that the design was unfair: either that only having a regulative pull instrument without lowering taxes on other goods is unfair, or that a tax will punish lower income groups while hardly affecting the rich.

Fairness in the eyes of those skeptical of a meat tax can roughly be divided into three aspects: beliefs about the commodity, the design of the instrument, and beliefs about actors. First, several posters expressed factual beliefs about the meat as being a necessity for a sufficient nutritional intake. Another argument was that the pricing of meat will become, or already is, too high, and, thus, a tax increase would be unfair.

> *I should not have to pay a lot of extra taxes because my body needs a certain diet. (Flashback).*

> *I'm already paying the highest taxes in the world on my salary and on practically everything I buy, and now meat is to be taxed as well? (Flashback).*

Second, tax as an instrument in itself is by some regarded as wildly undesirable, either by arguing that there already are (too many) taxes, or that taxes as a coercive measure is unfair. This is the case even if the perceived goal is desirable per se. As expressed by someone arguing against tax instruments for decreasing meat consumption:

> *Since the purpose is the carbon dioxide issue and the environment, there are other measures that address these purposes in a more holistic way. Information about how our consumption affects the environment, and perhaps then the role of meat in this system, would maybe have a greater effect in combination. (Flashback)*

This quote also reveals that fairness is correlated with effectiveness. A recurring pattern is that perceptions of a lack of effectiveness leads to statements of unfairness; i.e., if the policy is deemed ineffective in achieving its supposed benefits (or if the benefits are not considered desired), then what is left of a regulatory policy is only the cost, and thus the policy is perceived as unfair.

> *There shouldn't be punishing taxes for no reason. It's exactly the same with traffic congestion charges or fuel taxes, people will go by car just as much regardless of whether gasoline costs 16 or 14 SEK per liter. (Flashback)*

People need to eat REAL and prepared food. […] It's incomprehensible that there is a readiness to tax meat while letting sugar and trans fats slide. (Flashback)

Third, negative comments also discuss and compare fairness for groups/stakeholders affected. For example, some argue that a meat tax is unfair as it targets the wrong people. A recurring claim is that a meat tax would hit groups with lower incomes the worst, while hardly affecting richer segments of the population at all. Similarly, many express beliefs about consequences for domestic food production. Moreover, there is a polluters pay-reasoning present as well. As one poster suggests, arguing against the proposal:

It's not the consumers who should be blamed and given the responsibility to solve the problems. It's rather the producers, for example breeders, butchers, and stores that produce too many animals and meat that aren't even consumed. (Familjeliv)

Such a polluters-pay argument also manifests itself in comparative statements where decreased domestic meat consumption would have close to no impact compared to greater countries such as China or the US. Thus, it's not fair:

The best is if Sweden /…/ punishes itself to death, the worse off we are the greater the share to the MINISCULE share of Sweden's contribution to climate degradation. (Flashback).

This once again echoes the interaction between perceived effectiveness and fairness, where lacking in the former invokes the latter.

4.2.4. Effectiveness

4.2.4.1. Vegetarian days in school canteens. All posters with a positive attitude to meat-free days in school use arguments related to effectiveness, mainly referring to the effectiveness of the policy in reducing the negative effect on the climate. Some examples are shown in the quotes below:

The less we eat animal products, the better. Earth would feel really good if everyone became vegans. /../ If everyone would refrain from meat once a week, it would be a good first step. (Familjeliv).

You think that schools should serve only vegetarian food? Since that is the most climate friendly way, I mean. I think that's a good idea. (Familjeliv).

Some posters argue that vegetarian food is more effective for saving the environment than climate friendly meats, and that this is a reason to choose vegetarian food over for example Swedish meat, that some argue is better for the environment than imported meat.

One post also mentions that vegetarian days are effective both for the climate and with respect to animal welfare:

The vegetarian food during a week is always better for the environment and the climate than the meat menu. /…./Not wanting to eat meat for ethical reasons is for me a valid reason. The animals that the children eat in school, not least chicken, have lived quite miserable lives. So it's good that they/the children/ can be offered an alternative that is better in every way. (Familjeliv)

Posters who are negative to meat-free days in schools frequently refer to this policy as not being an effective way to protect the environment.[3] One argument put forward by several posters is that one instead should focus on other measures. Here is an example:

Personally, I think it's ridiculous to believe that one day would matter for the environment. What are they serving that day? Canadian salmon? Crop-sprayed soy beans grown on land previously covered by rain forest? Rice from China? Why not demand food that is better for the environment all week long for our children? (Familjeliv).

Related to this, some posters use arguments referring to factual beliefs that eating meat does not matter for the environment compared with for example flying abroad:

Eating meat is NOT a threat to the environment. Flying to Thailand (a popular Swedish vacation spot) is however definitely bad for the environment. (Familjeliv)

Some think that it would be more effective to serve meat produced in Sweden instead of implementing a vegetarian day:

Since Swedish ecologically produced meat is better for us than imported legumes that kill the rainforest, schools should of course serve meat to everyone who wants it. (Familjeliv).

The superiority of vegetarian food for the environment is questioned by some and used as a way to argue that meat-free days are ineffective. Posters here refer to factual beliefs that meat is harmless. The quote below also displays some suspicion that vegetarianism is just about politics, not a genuine wish to save the climate.

The point is, and always will be, that eating vegetarian is not necessarily the best way to go—if we're talking about the environment. There is no need to become a vegetarian in order to save the environment and there is no need for a "meat-free Monday." That stuff is just politics. One could easily reduce the problems for the environment by trading one meat for another. In that way we don't have to eat beans and lentils, but can eat good food. Veg advocates seem to have difficulties understanding this fact. (Familjeliv)

Distrust is also displayed in several other posts that relate to effectiveness as a value. They question the decision makers' motives for implementing a vegetarian day. Here is an example:

The negative thing with meat-free Mondays is as I see it not that the children don't get to eat meat that day (they get that for sure at home anyway), but the false environmental concern from the municipality. With one meat-free day a week they pretend to have adopted a position of being concerned about the environment, climate, and health. At the same time, they don't buy Swedish pork since that is too expensive. Instead, pigs and chicken are imported from countries where they are raised as cheaply as possible. Children learning that we take care of our animals before they become food, should be just as obvious as them learning to take care of the environment. (Familjeliv)

4.2.4.2. Meat tax. Positive sentiments include discussions on effectiveness in terms of human behavior, as well as characteristics of the commodity itself. While skeptics for example point to the high consumption of meat as a fairness issue, positive posters use this as an example of effectiveness. Effectiveness arguments also include beliefs about the meat production process, because this is perceived as more environmentally harming, reducing it is deemed effective. The quote below illustrates these points.

Yeah, because so many people eat 85 kg of passion fruits every year? And I don't understand what you mean. There's more emissions from meat than fruit farms. Are you referring only to the transportation? Well meat wins that as well because there is a lot of other transportation associated with it. (Flashback)

There's also a justification on the global scale. While recognizing that domestic consumption plays a limited role, such accounts argue along the lines of "many small streams make a big great river.".

[3] The posters do not always separate between protecting the environment and dealing with climate change. In the results, we follow the concepts used by the posters even though it means a certain inconsistency.

But if we consumed less meat, it would have an effect, just like it would have an effect if we simply stopped buying goods manufactured in an environmentally harmful way in China. Suppose that the entire Swedish population stopped consuming meat and that we also completely stopped buying products from China, what effect do you think that would have? Do you really believe that, e.g.*, the populations in Norway and Denmark would automatically make up for buying all the meats and products that we here in Sweden didn't buy? (Flashback)*

We find different strands of effectiveness reasoning among negative posters. The first draws on beliefs about anticipation of other people's behavior, namely that people will either simply continue their consumption and just pay a bit more, or they will purchase meat "on the black market" to avoid the tax. Such arguments treat meat consumption as a necessity, comparing it to for example driving.

The reason people buy meat is hardly because they want to harm the environment but because they want to buy meat. Anyone else who can imagine "meat smuggling" as a problem after implementing this policy? (Flashback)

People will continue to buy meat (people still drive cars), but they will be less happy and the cows will still have it as bad. (Flashback)

Another reasoning treated the policy as effective in changing people's behavior to a certain extent, but that it would bring about counterproductive consequences: if meat becomes more expensive, then more people will start buying cheaper meat from foreign countries, and thus, the increased shipping will negate or outweigh any positive effects.

If a meat tax is imposed, then consumers will probably buy worse meats that are cheaper and from other countries, and if more people buy the meat that's been shipped from afar, things will not improve. And with worse meats, more will get sick. (Flashback)

In a similar manner, some critical voices drew on comparisons with other products that are imported, or that are perceived as equally harmful health wise, claiming that a tax on meat would thus not be effective.

And like someone else said, it's not reasonable to impose a meat tax when so much else is being shipped so much further and causes greater harm to the environment. (Flashback).

If we are to believe that they do this for the sake of public health and the environment, why not implement a tax on candy and soda, raise the alcohol tax more, raise the tax on cigarettes more, why not make it extremely expensive to fly and so on? (Flashback)

The following reservation against the effectiveness of a meat tax compares Sweden to the rest of the world. Even if we were to successfully implement a meat tax that would be effective at a national level, it would have a marginal, if any, environmental impact on a global scale. Thus, the meat tax would only bear costs.

Do you really believe that if a couple of Swedes reduce their meat consumption by a couple of kilos per year, it will have a noticeable positive effect on the environment? (Flashback).

Lastly, we found some accounts of trust related to effectiveness. Vertical mistrust is expressed as a criticism of politicians' ability to implement and carry out effective policies:

I've grown tired of know-it-all politicians' poorly considered, impotent propositions that won't have any other effect than people having to pay more taxes. (Flashback).

Regarding horizontal trust, we found two different types of mistrust expressed. The first was a recurring slander of those perceived to support the meat tax, often named as leftist, greens, or vegans. The other type was a mistrust in people's intention to comply, claiming that a tax would drive people toward illegal purchasing:

The tax will lead to the development of a black meat market. About 20 years ago I purchased half a cow and put it in my fridge. There were many farmers back then who had livestock hidden that were easy to access. This will increase again if meddlesome politicians without common sense implement a meat tax. (Flashback)

We found accounts of (mis)trust only expressed by negative posters. In terms of vertical trust, criticism was mainly articulated as a suspicion or skepticism toward the state or politicians and their motives. Either that the tax was just another way of extracting revenue, or a disbelief in politicians' ability to carry out effective change.

If the state cares so much about nature, they should make the vegetarian alternatives cheaper. I don't believe at all that it's for nature's sake; since WHEN do they care about that???? They just want some extra money. (Familjeliv)

5. Discussion & policy implications

Our results clearly show that PSBs are important determinants of policy attitudes: people do care about fairness, freedom, and effectiveness consequences and these beliefs justify policy positions. However, both the quantitative and qualitative analyses highlight how PSBs are interpreted differently by posters expressing acceptability and non-acceptability of meat-free days in school canteens and meat taxes: Both groups most commonly use fairness and effectiveness arguments as justifications, but in opposite ways. Those in favor of the policies express beliefs that they will positively impact health and the environment (mirroring the survey results of Pechey et al. 2022), while those in opposition judge them as being both ineffective—for reducing both meat consumption and climate impacts—and unfair, having negative distributional effects.

These results strengthen the findings of Ejelöv and Nilsson (2020), that "perceived fairness itself is also positively related to the perceived effectiveness of a policy." More specifically, a common line of argumentation in negative posts led from skeptic comments about the perceived ineffectiveness of the policy to a sense of unfairness, indicating that policy-specific beliefs are not shaped and evaluated separately (as is often assumed implicitly in survey study designs).

Apart from the difference in their appraisal of the effectiveness and fairness of the policies, negative posters differed from positive posters in that they invoked notions of freedom and lack of trust in both the government and fellow citizens. The lack of trust led posters to question both the motives of politicians for introducing these policies, as well as the compliance—and hence policy effectiveness—by others. Some negative posters also fervently defended freedom of choice and stressed factual beliefs about the nutritional importance of eating meat, in line with studies in environmental psychology finding that one of the most common rationalizations omnivores provide for eating meat is that it is

necessary for personal health (Piazza et al. 2015).

However, perhaps the most interesting result here is that freedom arguments are much less prevalent even among negative posters, compared with the other PSBs. The exception here is the debate around meat-free days in school canteens, where freedom concerns is the main PSB raised by those negative to the policy intervention. This makes intuitive sense: After all, menu restrictions for school-aged children (who have little alternative to eating in the canteen) restricts personal freedom to a greater extent than a policy that just raises the price of meat (and where, instead, questions of equity and effectiveness come to the fore).

The fact that we are studying this in a Swedish context, during a specific period in time and in two specific online forums clearly puts limitations on which generalizations can be made. One of our important results is that we manage to identify factors that previous quantitative research has more or less assumed, also in this specific context. Factors that we have good reason to believe would be found in the discussion of sustainable food policy instruments, also in other contexts. Reflecting on our results and the (Swedish) policy development, we can conclude that it is nowadays quite common for schools in Sweden to only serve vegetarian food some days a week,[4] the intense debate on the social media platforms analyzed here has largely died down. It has been reported that in 2020, 60 % of Swedish schools had at least one meat-free day a week and over 80 % of municipalities tried to increase the share of plant-based food obtained through procurement. To some extent this is in line with previous findings on policy instrument attitudes. People seem to become more positive after it has been implemented (Schuitema, Steg & Forward, 2010).

The case for a climate tax on meat (or food in general), however, seems to face a much more difficult uphill battle in the Swedish context. In a survey among Swedish political parties before the 2022 national election,[5] five out of eight parties were outright dismissive of the idea, with many parties expressing arguments that resemble those found in our material: questioning of the effectiveness of a climate tax on food, pointing to the risk that a tax would negatively impact Swedish production, and saying that it would place an unfair burden on Swedish consumers.

Interestingly, in response to a broader question concerning how politicians can promote more healthy and sustainable food consumption, several parties—all on the right side of the political spectrum—argue that politicians should not interfere with what people eat, and there was a general unwillingness among all parties across the political spectrum to propose regulations in relation to food consumption. This can be contrasted with our social media analysis, where there is less emphasis on freedom even though such arguments do exist. Thus, the perception that what we eat is a very "private" matter, and that this makes governmental interference controversial, might not be as widespread as commonly thought, and might more reflect the opinions of a vocal minority. As shown by Drews et al. (2022), such vocal minorities can distort the perception of the existing support for climate policy among both proponents and opponents and entrench the resistance to climate taxes.

Thus, rather than abstaining from policy interventions in the area of sustainable food consumption due to general fears that it interferes with personal freedom, our results emphasize the need for policy makers to understand and address how concerns around freedom, fairness, and effectiveness engender non-acceptance and design policy (packages) that are sensitive to these concerns. As our unpacking of PSBs shows, this includes good policy communication to improve acceptability, not least when it comes to convincing those who believe that a more plant-based diet is detrimental to good health. It also includes the need to balance policy effectiveness with concerns for consumers in general and disadvantaged groups (children and low-income households) in particular; concerns that were played on heavily by industry organizations critiquing the new Nordic Nutrition Recommendations to lower meat and dairy consumption.[6] These recommendations also met with fierce opposition from the Swedish minister for rural affairs, who declared that the recommendations for lower meat consumption would not be adhered to as they unduly penalized Swedish meat producers,[7] a group for which fairness and effectiveness concerns are also raised among posters in our data.

In line with survey data from Germany and the US (Fesenfeld et al. 2020), our results thus show that there is neither unilateral support for, nor unilateral opposition against policies promoting more sustainable food consumption, but that policy design and packaging (e.g., through earmarking of tax revenues) are critical for raising policy acceptance.

A potentially interesting path to pursue would be to connect acceptability and legitimacy concerning environmental policies to research on democratic responsiveness. In this body of research, policy is not just seen as an output of political decisions, but as an input that creates frames and structures that affect people's incentives and perceptions (Pierson 1993). This means that people may adjust both attitudes and behavioral responses to a policy, and these changes are ideally fed back into the political system (e.g., Bendz 2015). Food regulation policies could thus be framed as an input that affect people's perceptions about the necessity of such regulations, as well as their behavior, and this may in turn have consequences for legitimacy and acceptance as the issue becomes a part of the democratic feedback loop.

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.

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[4] (https://www.livsmedelifokus.se/allt-fler-skolor-serverar-vaxtbaserat-for-miljons-skull/).

[5] See https://www.slu.se/centrumbildningar-och-projekt/futurefood/se-lyssna-folj/podden/fem-fragor-om-framtidens-mat—alla-svaren/.

[6] See this op-ed from the Federation of Swedish Farmers (https://www.aftonbladet.se/debatt/a/3ExAdd/lrf-stoppa-experimentet-med-svenska-folkhalsan) and the response from the Swedish Food Agency (https://www.aftonbladet.se/debatt/a/nQBA1m/livsmedelsverket-lrf-forsoker-skramma-manniskor).

[7] See https://www.aftonbladet.se/debatt/a/WRWQVG/kullgren-sverige-behover-oka-kottproduktionen and the response from the NNR project leader here https://www.aftonbladet.se/debatt/a/69e3J3/nnr-vi-forvantar-oss-att-aven-sverige-foljer-rekommendationerna.

Appendix

Table A1
Attitudes to vegetarian days in school canteens, and beliefs.

	Positive	Negative
Consequence for self	2	2
Consequence for everyone	2	0
Consequence for children	14	8
Consequence for farmers	0	0
Consequence for low-income groups	0	0
Consequence for consumers	0	0
Consequence for climate	14	2
Consequence for nature	3	1
Consequence for animals	2	0
Consequence for health	7	2
Health/nutrition statement	17	15
Domestic food production	2	2
Vegetarian food is good	9	0
Economy, cheap/expensive	1	0
Necessary to do something	6	0
Meat does not ruin climate/skepticism	0	10
Meat consumption is unethical for animals	2	0
Meat consumption not high/increased	0	2
We eat too much meat	17	0
Sweden unimportant globally	0	3
Meat consumption is bad for the environment	3	0
Not all meat is bad	4	4
This is not something new	17	2
Vegetarian food can harm environment	0	2
Vegetarian food can harm health	3	2
Horizontal trust	0	13
Vertical trust	1	12
Liberty/autonomy	9	30
Fairness	13	9
Effectiveness	15	18

Table A2
Attitudes to a meat tax, and beliefs.

	Positive	Negative
Consequence for self	0	4
Consequence for everyone	1	6
Consequence for farmers	1	12
Consequence for low-income groups	4	11
Consequence for consumers	0	3
Consequence for climate	8	4
Consequence for animals	2	6
Consequence for health	3	2
Health/nutrition statement	6	10
Domestic food production	3	7
Vegetarian food is good	2	0
Economy, cheap/expensive	4	3
Necessary to do something	5	0
Meat does not ruin climate/skepticism	0	6
Meat consumption is unethical for animals	0	1
We eat too much meat	2	0
Sweden unimportant globally	1	4
Meat consumption is bad for the environment	1	1
Horizontal trust	1	12
Vertical trust	0	16
Liberty/autonomy	0	10
Fairness	15	29
Effectiveness	20	33

Reliability analysis process

The different segments of the coding scheme and their procedure differ a bit in character. The positive and negative codes, as well as the policy-specific beliefs *freedom*, *fairness* and *effectiveness,* were pre-determined based on the research question. *Beliefs about consequences* were partly pre-determined, partly inductively developed and *factual beliefs* were inductively developed to capture vast and potentially unexpected reasonings.

The deductive part of the coding scheme was developed by coder 1 who also coded two of the forum threads analyzed here. The inductive part of the scheme was co-developed by coder 1 and coder 2 together. Coder 2 coded all four of the threads. For further intercoder coder reliability measures and width, coder 3 coded 2 of the threads. This resulted in one of the threads being coded by all three coders, two threads covered by two coders, and

one thread only covered by one coder. Thus, around 47 percent of the material was coded by more than one coder.

In the first coding step, discerning positive and negative posts, we rely on the recommended Krippendorff`s α method to measure the intercoder reliability (Krippendorff 2019). An α-score of 0.67 and upwards is regarded as acceptable reliability, whereas a score above 0.8 signals good reliability. Testing the intercoder agreement for positive and negative codes on the jointly analyzed material yielded an α score of 0.938, which is be regarded as reliable.

Turning to the other code categories, the initial ICA scores were below acceptable. We thus deemed it necessary to discuss cases of conflicting coding and the coding scheme applied and adjust the coding accordingly. Around 44 percent of the posts containing conflicting codes changed as a result of the joint re-examination, while keeping the remaining ones as proposed. With this careful process, where all coders could reach an agreement concerning the conflicting codes, we assess the final coding as reliable.

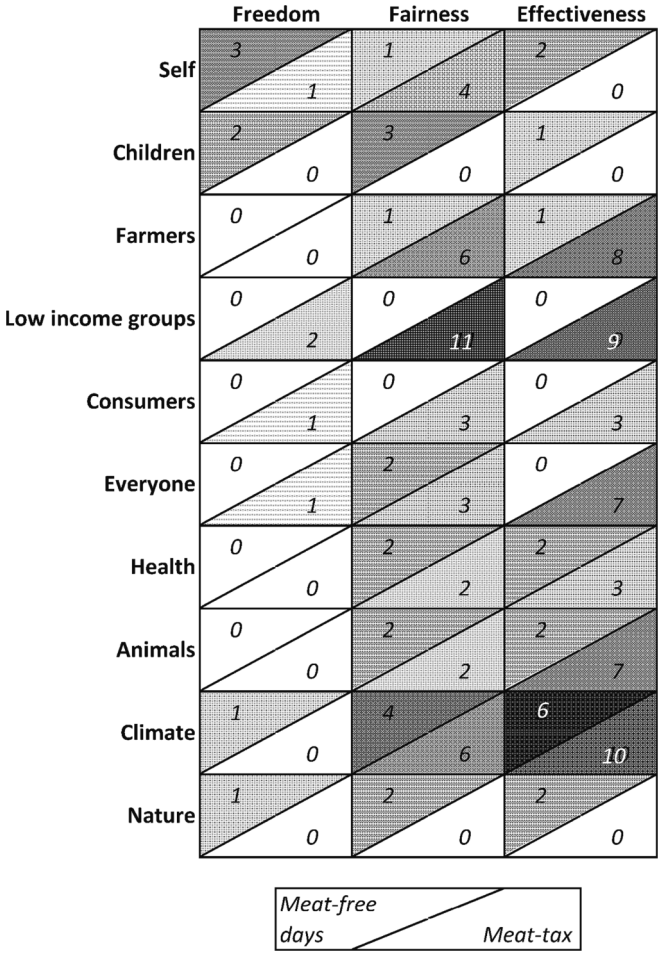

Fig. A1. Co-occurrence of policy-specific beliefs (freedom, fairness, and effectiveness) and statements regarding consequences for different groups or other entities. Numbers in each box displays the absolute numbers of co-occurrences in the data material for meat-free days in school canteens (upper-left) and meat tax (lower-right), respectively. Darker shading reflects a higher relative level (share of total co-occurrences for each policy) of concerns for a given group or entity.

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