Sustainable Production and Consumption 36 (2023) 338–353

Contents lists available at ScienceDirect

Sustainable Production and Consumption

journal homepage: www.elsevier.com/locate/spc

Review Article

# A review on policy instruments for sustainable food consumption

Jeanine Ammann [a,*], Andreia Arbenz [a], Gabriele Mack [a], Thomas Nemecek [b], Nadja El Benni [c]

[a] Agroscope, Research Group Economic Modelling and Policy Analysis, Ettenhausen, Switzerland
[b] Agroscope, Research Group Life Cycle Assessment, Reckenholz, Switzerland
[c] Agroscope, Research Division on Sustainability Assessment and Agricultural Management, Switzerland

ARTICLE INFO

*Article history:*
Received 17 October 2022
Received in revised form 9 January 2023
Accepted 14 January 2023
Available online 24 January 2023

Editor: Dr Laura Piscicelli

*Keywords:*
Food policy
Nudge
Tax
Regulation
Behaviour
Labels
Review
Consumer
Sustainability

ABSTRACT

The current food system is not sustainable, and food consumption contributes substantially to the climate crisis. Several challenges make it difficult for consumers to make sustainable food decisions. Therefore, policy action is indispensable to reduce the environmental impact of food choice. We present the results of a literature review of 160 studies, investigating four types of consumer-targeted policy instruments (market-based, information-based, regulatory, and nudging) and their potential to improve the sustainability of food systems. Our results show that (i) less intrusive policy instruments (information-based, nudging) are more popular and widespread and can be combined (however, more intrusive instruments [market-based, regulatory] are more effective); (ii) consumers rely on information-based instruments to make sustainable food choices and are willing to pay a price premium for sustainable products; and (iii) sociodemographic characteristics such as gender (female) and education level (higher) play a key role in sustainable food choices. Finally, we recommend improvements in the transparency of reporting methods and definitions used to describe sustainability of food products. This would increase the potential for comparison, transferability, and generalisability of findings and enable the development of effective policies. Sustainability is a pressing issue, and joint efforts along the food system are urgently called for.



**Contents**



* Corresponding author at: Agroscope, Research Group Economic Modelling and Policy Analysis, Tänikon 1, CH-8356 Ettenhausen, Switzerland.
*E-mail address:* jeanine.ammann@agroscope.admin.ch (J. Ammann).

https://doi.org/10.1016/j.spc.2023.01.012

## 1. Introduction

Food consumption causes greenhouse gas emissions, which directly contribute to climate change. In 2018, around 17 % of global greenhouse gas emissions were caused by agriculture and related land use emissions (FAO, 2020). Thus, the current food consumption is not sustainable, and the search for solutions to the climate crisis becomes more urgent as the consequences become more apparent. Given these challenges, governmental interventions are necessary to work towards more sustainable food consumption. Several such initiatives exist, such as the National Food Plan in Australia, the Farm-to-Fork strategy in Europe or the Sustainable Development Goals of the United Nations to name a few (see Gürsoy, 2022 for a detailed overview).

Often, markets are prone to failure, meaning that situations occur in which the allocation of goods in a free market are not efficient (NSW Department of Industry, 2017). To address this in a national context, governmental interventions are needed (Dollery and Wallis, 1997). Spiller et al. (2017) summarised six sources of market failure:

1. Although individuals make their own food decisions, the results (i.e., the resulting greenhouse gas emissions) affect society as a whole. These external effects should be internalised, making sure that subsidies do not encourage consumption of products with negative environmental impacts.
2. Unhealthy food choices contribute to higher health costs, which ultimately affect society as a whole.
3. Processed foods tend to be high in sugar and fat. This can lead to food addiction (Schulte et al., 2015), as evolutionary mechanisms draw people towards sweet and fatty (energy-dense) foods.
4. Psychological factors and numerous biases unconsciously contribute to consumers making suboptimal food decisions.
5. Consumers face information asymmetry in terms of health and sustainability. When making purchase decisions, they do not have sufficient information available to identify the most healthy and sustainable product. Similarly, effects on health and environment only become visible in the long term.
6. A few companies have most of the market power, meaning that a few players make most of the important decisions between production and consumption.

This overview of market failures illustrates the need for the government to intervene and highlights the close connection between health and sustainability (i.e., point 5). Measures to promote healthy food choices not only face the same difficulties (i.e., information asymmetry) but they often similarly contribute to more sustainable food consumption (Reynolds et al., 2014; von Ow et al., 2020), and these synergies should be exploited when designing policies. For the design and implementation of measures that enable consumers to make sustainable food choices, actors along the food system must develop a common understanding of what a sustainable diet is. A working group at the International Scientific Symposium "Biodiversity and Sustainable Diets: United against Hunger", organised jointly by the Food and Agriculture Organisation of the United Nations (FAO) and Bioversity International, held at FAO in 2010, came up with the following definition for sustainable diets:

> *"Those diets with low environmental impacts which contribute to food and nutrition security and to healthy life for present and future generations. Sustainable diets are protective and respectful of biodiversity and ecosystems, culturally acceptable, accessible, economically fair and affordable; nutritionally adequate, safe and healthy; while optimising natural and human resources".*
>
> [(FAO, *2012*)]

Given the importance of individual diets for the sustainability of the whole food system, the present work focused on consumer-targeted policy instruments that support more sustainable food choices. We focused in our review on environmental sustainability of food consumption. Here, we categorise the policy instruments according to the framework described by (Reisch et al., 2017): 1) information-based, 2) nudging, 3) market-based, and 4) regulatory instruments. This categorisation also overlaps with the categories used by other authors, such as Panzone et al. (2011), who worked with three categories: price (= market-based), quantity (= regulatory), and information (= information-based).

Information-based instruments include labels, education, campaigns, and the like, which aim to support consumers in their food decisions. They are the least intrusive, as consumers are free to use this information if they want to. Next, nudging instruments include nudges (measures that voluntarily shift consumers towards more sustainable choices (Thaler and Sunstein, 2008); and interventions (e.g., meatless Monday challenge). They are slightly more intrusive, as they unconsciously drive consumers towards more sustainable choices (nudges) or consciously try to establish new food habits (interventions). Market-based instruments include measures that affect prices, such as taxes or subsidies. Through financial incentives (positive or negative), they aim to drive consumer behaviour and are more intrusive than nudging. Finally, regulatory instruments, which include bans or limits, are the most intrusive, as they limit the product offer that is available to consumers (Spiller et al., 2017).

The present review provides an overview of the relevance and effectiveness of consumer-targeted policy instruments to support sustainable food choices and thus sustainable diets in a global context. Research gaps and future avenues for policy interventions are identified. We provide policymakers with a support tool to help them design their efforts and provide a scientific basis for the sustainability assessment of different policy instruments.

## 2. Method

In September 2021, we conducted a review of the literature on political instruments to promote sustainable food choices. To reduce possible bias when searching for and selecting appropriate articles, the study design was chosen in accordance with the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) statement protocol (Moher et al., 2009). Three major databases were used (Web of Science, PubMed, and Scopus), and the search string included various forms and combinations of *food, consumer, sustainability, environment, life cycle assessment, biodiversity, footprint, carbon, climate, policy, tax, prohibition, restriction, ban, information, nudge, label,* and *behaviour* (see Appendix 1 for the exact string). Fig. 1 outlines the search strategy and the categorisation for policy instruments considered, following the framework of Reisch et al. (2017).

First, we included "food" to limit our search to any research related to food. Next, we included "consumer" as our review focuses on the consumer side. Our search strategy dealt with sustainability in general with focus on environmental sustainability. Therefore, we both included key words aiming at sustainability as such (i.e., sustainab*, environment*),

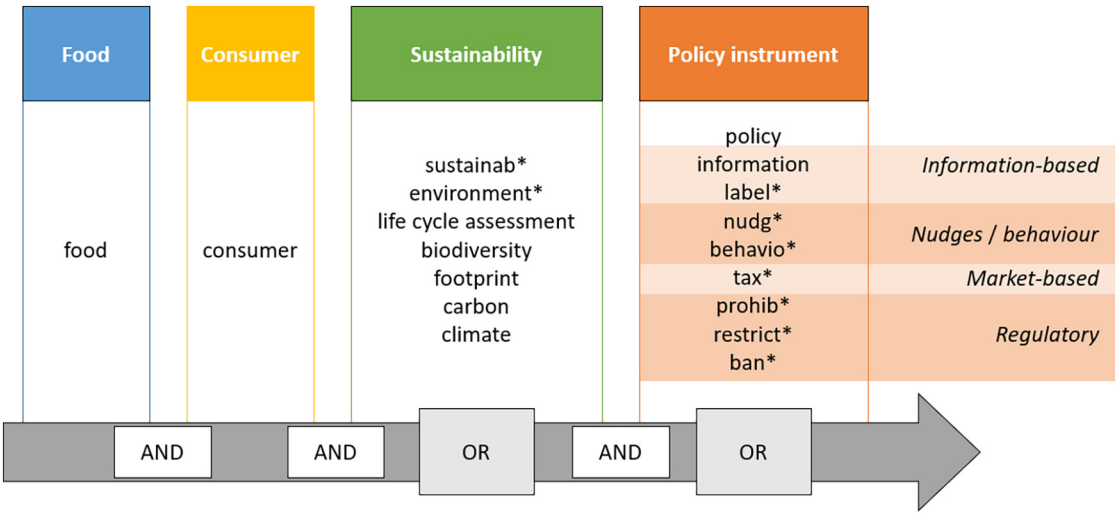


**Fig. 1.** Search strategy used and types of policy instruments, adapted from (Reisch et al., 2017). [* = wildcard in the search string].

but also specific aspects of or methods for assessing environmental sustainability (i.e., life cycle assessment, carbon, footprint) and biodiversity. Finally, for the policy instruments we used key words that cover the four categories as defined earlier.

In our search for journal articles, we imposed no restrictions regarding publication year. We did this for two reasons. First, we wanted to get a good overview on the literature available, knowing that we could still exclude articles based on publication year later on. Second, we were interested to see the change of attention on the topic over time. The first search resulted in 13,147 articles (6930 from Scopus, 5094 from Web of Science, and 1123 from PubMed), and 8033 articles remained after removal of duplicates. Next, we scanned abstracts and titles (screening). An article was included if it (1) was in English, (2) was published in a peer-reviewed journal, (3) dealt with consumer-targeted policy instruments to support sustainable food choices, (4) and was a primary source (i.e., neither a conceptual paper nor a review). In a final step, the criteria were applied to the full texts of the remaining 1846 articles. Following these criteria, 160 articles were selected (see Fig. 2).

## 3. Results and discussion

The 160 articles identified in our review were categorised according to the type of policy instrument used (see Appendix 2). In the following, we discuss the most important themes identified across these studies. Our structure emphasises the key findings and makes clear which aspects are relevant for shaping future work and policy recommendations. First, we set the scene by outlining the current context. Next, we review how instruments are tailored to consumers and analyse influential factors with a focus on sociodemographic variables. Finally, we discuss key barriers and recommendation for environmentally sustainable food consumption.

### 3.1. Description of policy instruments

To start this review, we analyse the type and effectiveness of food policy instruments used to encourage consumers to make more sustainable consumption choices. For this, we look at the four policy instrument categories and how they differ.

#### 3.1.1. Types of policy instruments

As previously noted (Reisch et al., 2017), we found that, with respect to the number of studies conducted on each type of policy instrument, information-based and education-oriented tools, summarised herein as *information-based* tools, are well-researched in the food domain (see Table 1), possibly because they leave consumers the choice of using or ignoring them. Most likely, it also reflects the dominance of these instruments in practical implementation. In the category of *information-based instruments*, we identified 3 papers dealing with social norms, 3 investigating communication, 5 looking at the importance of education, 20 examining information provision, and 92 investigating the effect of labels. The main goal of information provision for sustainable food is to help consumers in the transition to climate-friendly nutrition, building on the notion that a climate-friendly alternative is known and available (Gadema and Oglethorpe, 2011).

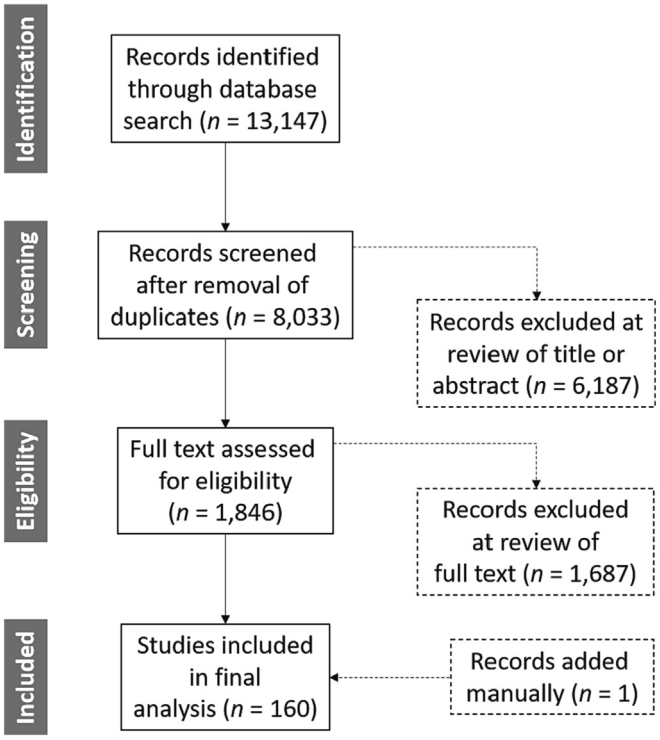


**Fig. 2.** Method used to identify articles dealing with policy instruments to increase sustainability in food choice, adapted from PRISMA (Preferred Reporting for Systematic Reviews and Meta-Analyses).

**Table 1**
Number of publications per category of policy instruments and examples for the instrument categories (N = 160).

| # articles | Examples for policy instruments | Categories of policy instruments |
|---|---|---|
| 123 | Label, information, communication, education | Information-based |
| 24 | Nudge, intervention, behaviour | Nudges |
| 11 | Tax, price, subsidy | Market-based |
| 2 | Regulation, law | Regulatory |
| 160 | | Total |

For *nudges*, we identified 24 papers, of which 8 looked at consumption of meat (alternatives) and another 6 looked at meals. The overarching aim of these studies was to achieve a behaviour change through nudges or interventions (e.g., meatless Monday challenge; (Ramsing et al., 2021)), which were tested using various methods, such as field experiments (Becchetti et al., 2020), surveys (Prusaczyk et al., 2021), or qualitative methods (McBey et al., 2019). In terms of meat consumption, we find that among the identified studies in our review, these studies only appeared after 2010, which indicates that this research interest is comparably young.

For the 11 studies focusing on *market-based instruments*, the majority used (model) calculations (n = 8), and only a few (n = 3) conducted an experiment or survey. This low number of studies likely reflects the low use of such instruments in practical implementation. Calculation- or model-based studies generally investigated the effects of taxes and subsidies on welfare, on households' carbon footprints (Latka et al., 2021; Panzone et al., 2021; Renner et al., 2018), and on individuals' tax burden. When dealing with model calculations, it is important that interpretations consider the fact that consumer acceptance of policy instruments remains unknown. One of the experimental papers in our review was among the few that focused on consumer acceptance of policy instruments (Graça et al., 2020). The other two experimental studies used an online supermarket and investigated the effects of different *market-based instruments* (taxes and subsidies) on the carbon footprints of food baskets (Panzone et al., 2011; Panzone et al., 2021). Finally, little research has been conducted on *regulatory instruments*; our review identified two papers (see Table 1). It seems that food is a sensitive topic where the government is hesitant to intervene (Wahlen et al., 2011).

*Information-based instruments* and *nudges* were present in the literature early on, whereas *market-based* and *regulatory instruments* appeared around 10–15 years later, with a general tendency towards an increasing number of publications on policy instruments for sustainable food choice over time (Fig. 3). A possible explanation is that for a long time, most policy instruments used for the reduction of greenhouse gas emissions have been targeting the production and supply side, and more and more consumer-targeted policies are considered to improve sustainability of the food system (Abadie et al., 2016). Furthermore, the increasing interest in sustainable food behaviour could also be due to the fact that climate protection measures are becoming more urgent, and agricultural production is a powerful lever in reducing greenhouse

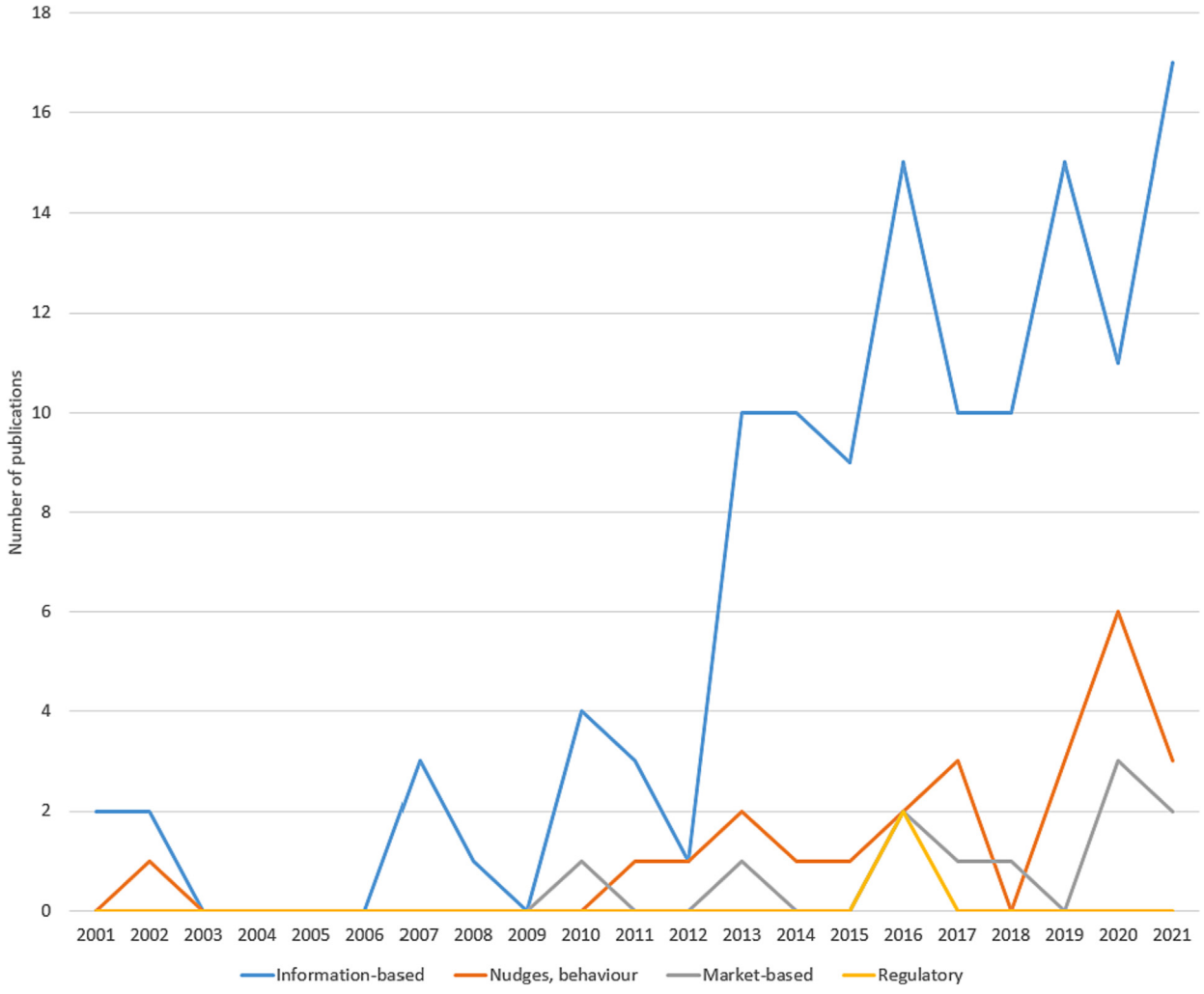


**Fig. 3.** Number of publications per year and type of policy instrument (N = 160).

gas emissions (Johnson et al., 2007). Still, it is striking that environmental sustainability has been a topic of scientific debate for quite a while.

*3.1.2. Intrusiveness of policy instruments*

Previous classifications of pro-environmental behaviours have distinguished between direct and indirect behaviours (e.g., changing personal habits to reduce one's carbon footprint versus signing a petition for government action) and high- and low-cost behaviours (e.g., buying organic products versus recycling), assuming that behavioural costs influence individuals' attitudes about behaviour (Tobler et al., 2012). The costs in this sense relate to various factors beyond the economic costs, such as time or effort needed or discomfort caused (Diekmann and Preisendörfer, 2003). This distinction can also be transferred to policies, that is, distinguishing between "softer" (indirect/low costs) and "harder" (direct/high cost) policies. Many studies, including most of the studies identified in this review, have focused on policies that are relatively "soft" when compared with "harder" policies such as rationing or banning products (Graça et al., 2020).

A similar approach to the distinction between direct and indirect pro-environmental behaviour is the categorisation of policy instruments according to their intrusiveness. For instance, taxes are much more intrusive because they are compulsory and affect all consumers, whereas labels are less intrusive and can be ignored willingly. Consumers show higher acceptance for less intrusive interventions, which could be a reason more research has focused on this type of instrument (Fig. 4). Unfortunately, more intrusive measures are usually more effective (Diepeveen et al., 2013).

*3.1.3. Food categories*

Food products differ in their environmental footprint. Thus, some foods bear more potential for policy interventions. A frequently investigated category in the reviewed studies is meat (Fig. 5). This agrees with findings from other researchers (Reisch et al., 2021a), who report a research focus on meat but little research on dairy. Given that meat is among the most resource-intensive products and a reduction in meat consumption is among the best food-related greenhouse gas emission attenuators (Ekelund et al., 2014), this is not unexpected. Model calculations revealed that a carbon footprint label on meat and alcohol as compared with other food products would yield the largest effects regarding emissions reduction (Shewmake et al., 2015) and a recent review concluded that meat is under-priced (Funke et al., 2021). Still, this contrasts to the finding that few policy instruments are used to help consumers reduce their meat consumption (Tjärnemo and Södahl, 2015), and those efforts focus on *nudges*, which are among the least intrusive instruments Fig. 5).

Meat consumption is a highly routinised behaviour, which is rooted in food culture and has been shared over generations (McBey et al., 2019). Therefore, reducing it is difficult, requires a change in habits, and might require new cooking skills (Apostolidis and McLeay, 2019). One possibility to increase sustainability while sticking to habits is to promote meat alternatives through nudging. Acceptance of meat substitutes can be promoted through the use of carbon labels or information interventions (Edenbrandt and Lagerkvist, 2021; Jalil et al., 2020). Indeed, *nudging* (e.g., making the more sustainable burger the default) and *information-based instruments* successfully increased sustainable option choices (Prusaczyk et al., 2021; Vlaeminck et al., 2014).

Another important animal product in the sustainable food literature is seafood. It is affected by issues such as overfishing, damage to the marine habitat, or carbon dioxide emissions from fishing boats, which have an important impact on the climate and the increase in global seafood consumption. Here, *regulatory measures* (in China; (Fabinyi, 2016)) and *information-based measures* had a positive influence (i.e., more sustainability) on consumption (Jin et al., 2018; Xuan, 2021), especially when labels were accompanied by social norms (Richter et al., 2018).

For fruits and vegetables, we found a focus on *information-based instruments* (Fig. 5). Consumers generally preferred local or organic produce, possibly because this information is used as a heuristic for the sustainability of the product (Scheibehenne et al., 2007; Vermeir and Verbeke, 2008). *Information-based* measures are used to communicate this to consumers.

Finally, wine, chocolate, and coffee were another product focus in the research identified herein (Fig. 5). We assume that due to a frequent price premium related to sustainability claims, these luxury products are of higher interest for producers than staple products. The effect of information-based instruments might be limited, as consumers ignored sustainability labels on chocolate (Silva et al., 2017) and perceived coffee as a "natural product", thus being unaware of its climate impact (Birkenberg et al., 2021).

*3.2. Tailoring policy instruments to consumers*

Policy instruments are most effective when they are tailored to specific consumer segments (Jiang et al., 2020). However, studies differ significantly in the way they form these segments. We therefore discuss some characteristics that influence sustainable consumption and should be considered when designing policy instruments.

*3.2.1. Sociodemographic characteristics*

*3.2.1.1. Age.* The effectiveness of *information-based instruments* depends on consumers' age. Several studies have found that age influences the

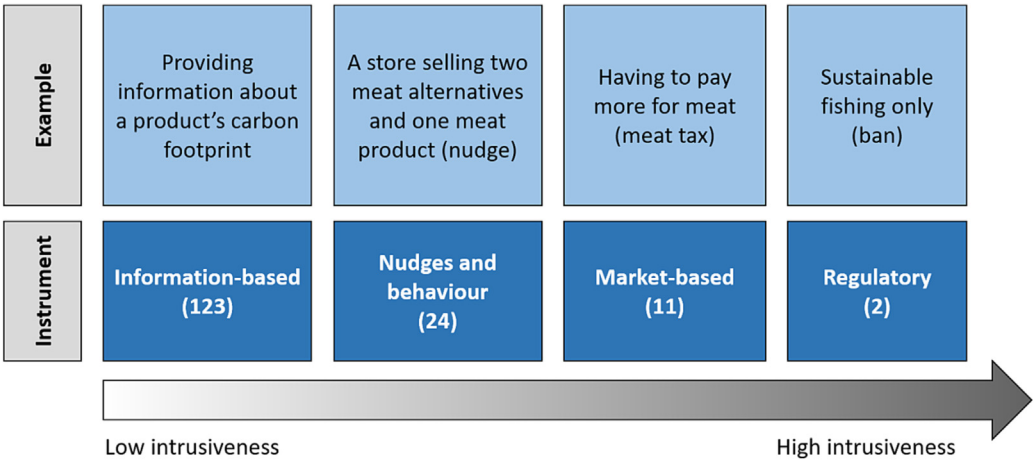


**Fig. 4.** Categorisation of policy instruments according to intrusiveness and number of publications per instrument (N = 160).

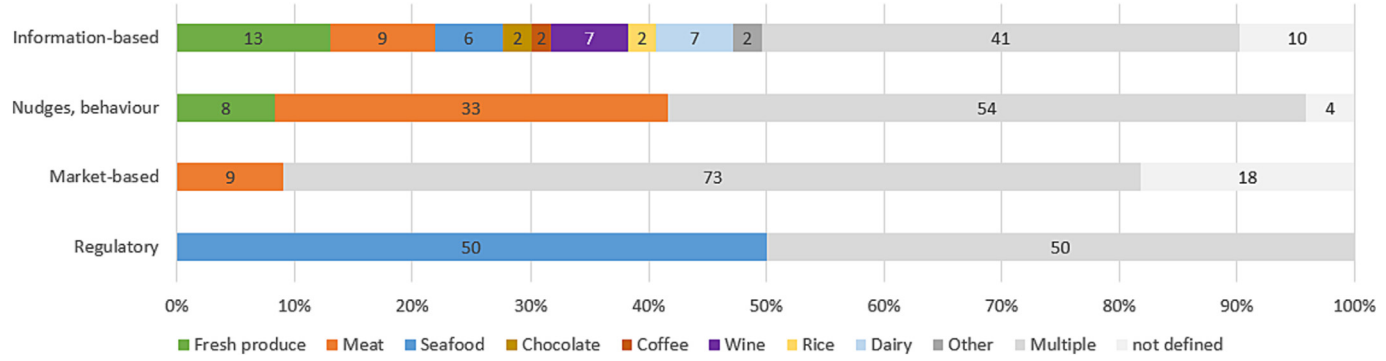


**Fig. 5.** Overview of product focus across the selected studies (N = 160). The category "multiple" summarises studies which investigated meals or multiple foods, "other" summarises single mentions, and "not defined" summarises studies which did not specify the foods.

perception of ecolabels (Calderon-Monge et al., 2020) and sustainable food products in general. However, there are conflicting findings regarding the direction of the relationship. Some studies found that older individuals are more likely to buy sustainable products (Johnston et al., 2001; Pomarici and Vecchio, 2014), pay more for sustainability (Vecchio and Annunziata, 2015), which might be due to more economic power of older individuals (Vecchio, 2013). Other studies report that environmental knowledge influences younger consumers more than older ones (Tansakul et al., 2018), younger consumers are more concerned about the environment and ethical issues (de-Magistris et al., 2017; Durham et al., 2012), and they are willing to pay more for certified products (Moscovici et al., 2020). Another study found that younger individuals are more open to accepting sustainable changes in their worksite canteen (Lorenz-Walther and Langen, 2020). As the younger generations will have to deal with the environmental consequences of our current food choices longer than the older generations, these findings are not unexpected.

*3.2.1.2. Gender.* Females were found to have a higher willingness to pay for products that are labelled as sustainable (Loureiro et al., 2002; Moscovici et al., 2020; Vecchio and Annunziata, 2015) and were more likely to buy sustainable products (Johnston et al., 2001; Pomarici and Vecchio, 2014) as compared with males. Furthermore, females had an overall higher level of knowledge (Vecchio et al., 2015), were more concerned about sustainability (Grunert et al., 2014), and attached more importance to ecolabels (Calderon-Monge et al., 2020) than males did. Other studies found that males will choose the ecolabel as long as it is priced sufficiently lower (Durham et al., 2012) and have a strong willingness to pay for low-carbon products (Chuanmin et al., 2014).

*3.2.1.3. Education.* Another influential factor is education, as education directly influences knowledge (Valor et al., 2013; Vecchio et al., 2015). Consumers with relatively poor knowledge of the production standards of ecolabels still present positive attitudes towards ecolabelled products because they believe that these products are healthier and more environmentally friendly (Liu et al., 2017). Consumers with higher education have a better understanding of sustainability (labels), are more sensitive to environmental issues, and are frequently more willing to buy labelled products (Chuanmin et al., 2014; Feucht and Zander, 2018; Grunert et al., 2014; Mancini et al., 2017). They further attach more importance to ecolabels (Calderon-Monge et al., 2020).

*3.2.1.4. Income.* Higher social classes report more use of environmental sustainability labels (Grunert et al., 2014; Johnston et al., 2001) and preference for animal welfare (Howard and Allen, 2010). Given that high-income households have more economic possibilities, willingness-to-pay estimates for participants with higher incomes are higher than for those with a lower income (Van Loo et al., 2014; Vecchio and Annunziata, 2015). One study, however, reported a higher willingness to pay for low-income as compared with high-income individuals (Moscovici et al., 2020). As the study investigated eco-certified wine, it might either be that wine is a special product category or, more generally, that the younger individuals with lower incomes in that sample are more sensitive to sustainability and eco-certified products in general (see also above the discussion regarding age). Irrespective of income, sustainable consumption should be affordable (Dixon and Isaacs, 2013; Lee et al., 2021). In very remote areas of Australia, recommended diets were found to be unaffordable (Lee et al., 2021), which is a huge barrier to sustainable consumption. Therefore, policy efforts should ensure that all income groups can afford an environmentally sustainable diet.

*3.2.1.5. Place of residence.* Results further showed that living in an urban area affects the knowledge of labels (Engels et al., 2010; Vecchio et al., 2015) and increases the probability of buying sustainable wines (Pomarici and Vecchio, 2014). Other studies found that urban consumers are very price sensitive and have less desire to pay a higher price for sustainability-labelled products (Kaczorowska et al., 2019). Rural residents were found to prefer local products (Howard and Allen, 2010) and were more conscious of nature, respecting seasonality (Mancini et al., 2017).

*3.2.2. Cultural differences*

Countries differ in their levels of environmental concern. For instance, Poland and Sweden tend to have low levels of concern about sustainability issues, whereas Spain, the UK, and Germany tend to have higher levels of concern (Grunert et al., 2014). As a result, German consumers have stronger preferences for sustainable products (Grebitus et al., 2016). Overall, results indicate that there are substantial differences across nations in terms of preferred labels, as well as factors driving sustainable consumption, such as environmental concerns (Zepeda et al., 2013). Therefore, policymakers must consider national differences in designing measures that fit the target audience.

*3.2.3. Taste and price*

Finally, taste and price are two central drivers for food choice (Kourouniotis et al., 2016; Rousseau, 2015; Silva et al., 2017; Silva et al., 2019; Steenhuis et al., 2011). These attributes are universally important for all consumers. The most sustainable food product is worthless to consumers if it does not taste good or is unaffordable. Various studies found that taste is a crucial factor when choosing sustainable food (Schmit et al., 2013; Yang et al., 2021). This is little surprising, as sensory experience is a way of immediate gratification, and individuals tend to focus on the present (instead of the future) and value immediate returns. For sustainable food, returns focus on the future (e.g., more biodiversity) and therefore provide less utility to consumers. The same is valid for health claims, which promise long-term future benefits for consumers (De Marchi et al., 2016; Ekelund et al., 2014).

Price (i.e. affected by *market-based* or *regulatory measures*) can support *information-based measures* as it can serve as an easy heuristic and is one of the main criteria in deciding for or against a purchase (Lampert et al., 2017). Indeed, the likelihood of choosing a labelled product strongly depends on the price premium (Johnston et al., 2001; Zhao et al., 2020). Respondents who indicated that they had not purchased environmentally friendly products in the last four weeks were more likely to be guided by low prices (Peschel et al., 2016).

Consumers are willing to pay a premium for different types of sustainability, which can be communicated using *information-based instruments* (Akaichi et al., 2016; De Magistris et al., 2015; Loureiro and Lotade, 2005; Tian et al., 2021; Vecchio and Annunziata, 2015; Xuan, 2021). Data collected in 1994 suggested that the majority of respondents were willing to pay a premium for environmentally friendly techniques (Moon et al., 2002). A possible explanation is that price might be regarded as a signal of unobserved product qualities, such as taste (Zhou et al., 2017).

Table 2 provides an overview of the price premium for sustainable products found across studies. However, results are difficult to compare as standards between sustainability labels differ fundamentally (Bissinger, 2019). The current literature regarding price premiums for sustainable products relies heavily on stated preference measures and survey techniques (Loureiro and Lotade, 2005). Therefore, when putting these results into context, it is important to keep in mind that consumers' buying behaviour is inconsistent with their stated attitude, especially for social, ethical, or environmental attributes (e.g., Vermeir and Verbeke, 2008).

### 3.3. Key barriers and recommendations for sustainable food consumption

To conclude this review, we identify key barriers for sustainable consumption and look at the effectiveness of the four instrument categories. We present evidence that instruments should be combined to increase effectiveness and that intensified cooperation from all actors along the food supply chains is needed to achieve the sustainability goals.

#### 3.3.1. Sustainability measures across policy instruments

One central barrier to sustainable food choices is that definitions of sustainability differ significantly or are lacking entirely. In terms of differing definitions, it has been argued that sustainability consists of three pillars, that is, environmental, economic, and social sustainability (Purvis et al., 2018). However, we rarely talk about all three pillars when we talk about sustainability and most often, no definitions are provided at all. For instance, researchers reported that from 124 submissions to the Green Paper (a government discussion paper), only 3 included a definition of sustainability (Trevena et al., 2015). Besides differing or lacking definitions, the understanding of sustainability varies among individuals, for instance between consumers, retailers, and stakeholders (Lehner, 2015; Trevena et al., 2015). Trevena et al. (2015) found that while the overall framing of sustainability was similar for industry and civil society, major differences emerged as civil society often linked food supply and health. The industry, however, had a stronger focus on economic sustainability. This diversity is also apparent in the studies reviewed herein. Both the method used to assess sustainability (e.g., life cycle assessment) and the sustainability indicator considered (e.g., biodiversity) vary widely (Fig. 6). With "sustainability indicator" we refer to the specific aspect used to measure sustainability, that is, whether sustainability refers to greenhouse gases, water consumption, or organic certification. To unite all actors along the food value chain and enable them to work together, it is, therefore, of crucial importance that they use a common language and sustainability framework (Fanzo et al., 2021).

Moreover, food sustainability does not only encompass the environmental pillar. Consumers appreciate both environmental and social information, that is, environmental footprint, animal welfare, ethical aspects, and health (De Marchi et al., 2016; Yang et al., 2021). Thus, both the environmental and social (health and ethics) pillars of sustainability play a role in sustainable purchasing. As a result, there is some debate regarding the combination of labels. Whereas some researchers have found that combining the carbon footprint and health information on a product can be beneficial (Huang et al., 2021), others report that having two labels improves the nutritional quality but not environmental friendliness of food consumption (De Bauw et al., 2021). This could be the result of overload confusion (see later) or consumers valuing health information more than environmental friendliness because the former directly affects them whereas the latter affects them only indirectly through societal effects or effects on future generations.

Several studies agree that health benefits are an important driver for sustainable food purchasing (Feucht and Zander, 2018; Lang, 2009; Nassivera and Sillani, 2016), even more so than environmental friendliness. One example highlighting this is blended meat products, where part of the meat is substituted with vegetables. For this product, health aspects are more important than carbon labels (Edenbrandt and Lagerkvist, 2021). Indeed, the majority of consumers who reduce their meat consumption do so for self-focused, health-related reasons (Apostolidis and McLeay, 2019). In contrast, Osman and Thornton (2019) found that information provision (including a label) positively impacted consumers similarly for health and environmental friendliness with small indications that when two labels were used, there was a tendency towards environmentally friendly consumption.

Consumers are also placing increasing emphasis on ethical and social aspects when buying food (Silva et al., 2019), and our review indicates

**Table 2**
Overview of price premium for sustainable products across studies.

| Study | Product | Label | Price premium |
|---|---|---|---|
| (Berghoef and Dodds, 2011) | Wine | Ecolabel | 65 % |
| (Van Loo et al., 2014) | Meat | Free range claims | 43–93 % |
| (Mazzocchi et al., 2019) | Wine | Biodiversity | 38 % |
| (Echeverría et al., 2014) | Fluid milk | Carbon footprint | 29 % |
| (Drichoutis et al., 2016) | Eggs | Climate neutral | 28 % |
| (Drichoutis et al., 2016) | Olive oil | Climate neutral | 23 % |
| (Jo et al., 2019) | Forest products | Ecolabel | 21.9 % |
| (Feucht and Zander, 2018) | | Carbon footprint | Up to 20 % |
| (Echeverría et al., 2014) | Bread | Carbon footprint | 10 % |
| (Nassivera and Sillani, 2016) | Minimally processed food products with environmental benefits | Ecolabel | 10 % |
| (Pomarici et al., 2018). | Wine | Water saving label | 8 % (4.51 euro for a labelled product as compared with 4.16 euro for a conventional product) |
| (Loureiro et al., 2002) | Apples | Ecolabel | 5 % (about 5 cents per pound over an initial price of 99 cents) |
| (Zhao et al., 2020) | Milk products | Carbon footprint | 3.2 % |
| (Rousseau, 2015) | 100 g chocolate | Fair trade | 2.03 euro |

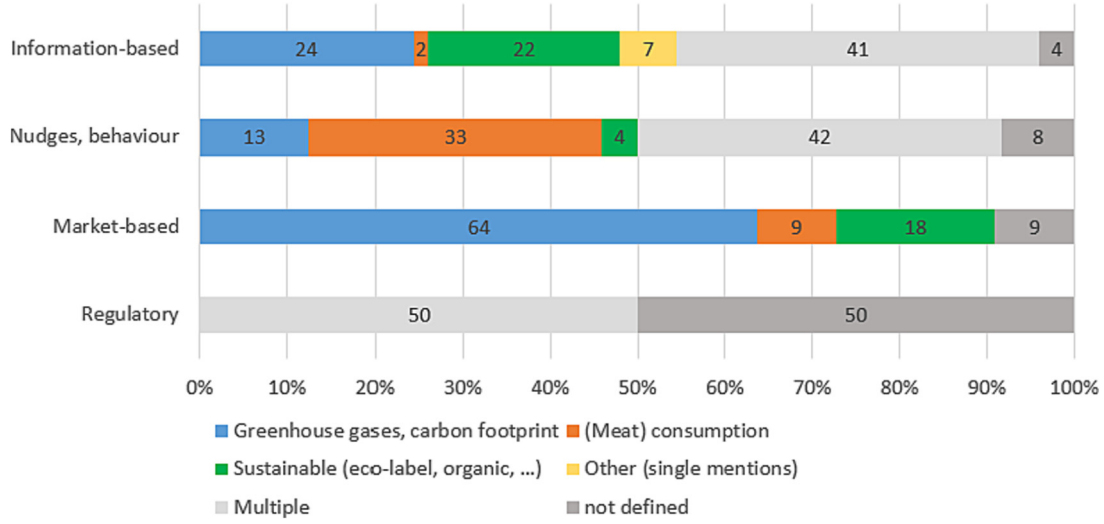


**Fig. 6.** Sustainability indicators used across the reviewed papers (n = 160). The total number of occurrences is more than the total number of papers as some of the papers used more than one indicator. The category "multiple" summarises papers that used more than one indicator.

that these aspects are more important than environmental aspects. Sustainable labels that are socially beneficial but are not to the consumers' own interests still lead to higher purchase intention (Jin et al., 2018), indicating that altruism can be an important driver of food choice. We argue that the global scale and overall complexity of the environmental problem is relatively hard to grasp, and therefore, social sustainability, which reflects issues that are much closer to our own nature, are valued more. Still, the situation is evolving, and novel movements such as the climate youth significantly contribute to an increased public awareness of environmental problems.

### 3.3.2. Effect size and duration

Policy instruments differ in the way they work and in their effectiveness (see Table 3 for an overview). For *information-based instruments*, we found that the impact of labels and information on consumers' ability to choose the environmentally friendly alternative is minimally effective (Bellotti and Panzone, 2016; Lazzarini et al., 2018), depends on the consumer group (Koistinen et al., 2013), and tends to be short term (Elofsson et al., 2016; Slapø and Karevold, 2019). Only a few shoppers (i.e., 13 %) took the time to read the information provided for their canteen lunch, and a small but significant shift towards 3 % lower $CO_2$ scores for the lunches was achieved (Spaargaren et al., 2013). Providing qualitative information about the environmental footprint increased the demand for the certified milk by approximately 6–8 % (Elofsson et al., 2016) and reduced sales of meat dishes by 9 % (Slapø and Karevold, 2019). Labelling improved the environmental impact of food baskets without affecting the price or the nutritional quality of the food purchased, with a decrease in emissions of around 10 % (Muller et al., 2019). Similar results were found for education, which initially fostered the intention to consume more environmentally friendly products. This change did not persist over time and did not lead to behaviour change (Fröhlich et al., 2013).

*Nudges* can lead to small improvements, but major structural changes are required for more substantial changes (Kaljonen et al., 2020). For *regulatory instruments*, we found that bans are most effective because they remove the polluting alternative (Panzone et al., 2011). However, because this is hard to implement due to low consumer acceptance, targeting the supply side by eliminating the polluting options or reducing their availability would be an easier to implement alternative (Panzone et al., 2011). For *market-based instruments*, subsidies for the cleaner alternative proved ineffective (Panzone et al., 2011). It has been reasoned that the subsidy removes desirable social signals, that is, paying for the environment without getting a return, and creates feelings of unfairness due to governmental intervention (Panzone et al., 2011). Taxes were effective in reducing the carbon footprint (Edjabou and Smed, 2013; Latka et al., 2021), but it must be considered that greenhouse gas and carbon taxes are regressive, which means that households with lower incomes have to pay higher shares of their income on the tax (Feng et al., 2010). This effect can be diffused by taking redistributional measures.

It appears that rather than using a single policy instrument, sustainable food environments can be achieved through combining instruments (Girod et al., 2014; Panzone et al., 2011). In this regard, *information-based measures* are of significant interest as they can be combined with other instruments. One of the few studies which compared different instruments tested the combination of $CO_2$ labelling, a greenhouse gas abatement subsidy, and product-specific bans (Panzone et al., 2011). Based on consumer preferences, they found that among these instruments, quantity instruments performed better than did price incentives and labelling (Panzone et al., 2011). Still, they concluded that improvements in sustainable consumption can be achieved by combining instruments. For instance, certain products could be banned in certain contexts (e.g., sugared beverages at school) but remain available in other contexts. Ultimately, this would reduce consumption. At the same time, subsidies or tax can be used to promote further shifts in consumption (Panzone et al., 2011). We conclude that *information-based instruments* are particularly important as they could accompany other instruments and contribute to consumer education (Panzone et al., 2011). For instance, positive synergy effects were found for the combination of a carbon label and a direct trade claim (Birkenberg et al., 2021).

### 3.3.3. Information-based instruments

Labels, as a prominent example of *information-based instruments*, can be divided into two types, depending on how they are intended to be used by consumers (Carrero et al., 2021). The first type is *value-based labels*, which follow an appetitive logic. They communicate a product attribute that consumers might appreciate (e.g., organic, Fair Trade, or vegan). The second type is *warning labels*, which follow an avoidance logic. They signal a product attribute that consumers might want to avoid. They are usually associated with hazards that directly affect consumers (e.g., tobacco, alcohol, or sugar). An important difference is that warning labels are mandatory, whereas carbon labels are not (Carrero et al., 2021).

Overall, consumers appreciate carbon labels (Hartikainen et al., 2014), biodiversity labels improve willingness to pay (Mazzocchi et al., 2019), and environmental claims improve product perception (Biondi and Camanzi, 2020; Kimura et al., 2010). Several studies (Aprile et al., 2012; Prell et al., 2020) indicated that certified labels

**Table 3**
Effect sizes and main findings found for the different instruments (N = 160).

| Instrument | Effect size | Sources |
|---|---|---|
| Information-based | Label, information, and education did not considerably improve respondents' ability to evaluate the environmental sustainability of foods | (Grunert et al., 2014) (Lazzarini et al., 2018) |
| | Small effects (around 10 %) | (Bellotti and Panzone, 2016) |
| | Short term | (Slapø and Karevold, 2019) |
| | Presence of traffic light labels led to positive shifts towards lower carbon emissions | (Elofsson et al., 2016) |
| | Label increased the eco-friendliness of consumption by around 5–10 % | (Fröhlich et al., 2013) |
| | Signs increased demand for certified milk by 6–8 % | (Osman and Thornton, 2019) |
| | Labelling decreased meat sales by 9 % | (Gadema and Oglethorpe, 2011) (Vlaeminck et al., 2014) (Muller et al., 2019) |
| Nudges | Small effects | (Kaljonen et al., 2020). |
| | Short term | (Bschaden et al., 2020) |
| | Effect did not diminish over time, more than 90 % of participants intended to continue reducing their meat consumption | (Ramsing et al., 2021) |
| | Performed actions increased from 64 % to 80 % after treatment | |
| | Eight-week intervention was effective at increasing consumer awareness | (de Koning et al., 2016) (Robinson et al., 2002) |
| Market-based | Subsidisation of the cleaner alternative proved ineffective | (Panzone et al., 2011) |
| | Taxing $CO_2$ provides an option for an ambitious short-run climate policy with moderate welfare effects that could be turned into welfare gains with proper redistribution schemes | (Panzone et al., 2021) (Renner et al., 2018) |
| | Most efficient scenario: decrease in carbon footprint from foods for an average household of 2.3–8.8 %, cost of 0.15–1.73 DKK per kg $CO_2$ equivalent | (Edjabou and Smed, 2013) (Hoek et al., 2017) |
| | Most effective scenario: decrease in carbon footprint of 10–19 %, cost of 3.53–6.90 DKK per kg $CO_2$ equivalent | (Caillavet et al., 2016) |
| | 20 % price increase (tax) for animal-based products can reduce $CO_2$ emissions by 271–293 g per household and day | |
| Regulatory | Most effective policies completely remove the polluting alternative | (Panzone et al., 2011) |
| | Decrease in supply of environmentally unfriendly options as second-best alternative | |

promote the purchase of sustainable products (Eldesouky et al., 2019). However, labels also face difficulties. For instance, poor communication can lead to confusion (Gadema and Oglethorpe, 2011) and several sources of confusion have been identified. *Similarity confusion* can arise from labels that appear similar and use confusing and unclear wording such as “natural” or “eco-friendly”, which leaves ample room for interpretation (Moon et al., 2016). To avoid this, unique and simple labels should be designed. Having too many labels on a product can lead to overload confusion (Moon et al., 2016). Yet again, providing a simple label can help avoid information overload and increase sustainable consumption (Sirieix et al., 2013; Weber, 2021).

Studies also find that local production is favoured over climate friendliness across countries (Feucht and Zander, 2018), possibly because it is easier to understand. Similarly, a vague label is more appealing than a brief claim, as consumers do not appreciate having to read lots of text (Yang et al., 2021). The use of such information was found to increase the overall eco-friendliness of subjects' food consumption by about 5 % relative to the default label used in current markets (Vlaeminck et al., 2014). Finally, confusion can also arise from the inconsistency between the information communicated and consumers' prior knowledge about ecolabels on a product (Moon et al., 2016). It can cause distrust and dissatisfaction and should therefore be avoided (Moon et al., 2016).

As mentioned earlier, care must be taken when combining labels to prevent overload confusion. Label combinations can detract from a product's value (Sirieix et al., 2013). Still, environmental benefits should be combined with other values, such as naturalness or healthiness (de Boer et al., 2013; Wolff et al., 2016), and easy nudges, such as playing nature sounds, as this can have a positive impact on sustainable purchasing (Spendrup et al., 2016).

One difficulty to consider when combining products is the negative footprint illusion. This means that when individuals estimate the environmental footprint of a product, it tends to decrease when a sustainable product is added and the combination of both products is assessed for its environmental footprint. In reality, it has increased because a product was added (Gorissen and Weijters, 2016). Consumers tend to underestimate the environmental impact and might even consume more when their meal includes sustainable products (Gorissen and Weijters, 2016). In this case, using labels to inform consumers about the carbon footprint of each product can guide them towards more sustainable food choices and reduced consumption, as the products are easier to compare (Farmer et al., 2017).

Another key barrier for labels is that sustainability and label knowledge is low (Grunert et al., 2014; Rousseau, 2015; Vecchio et al., 2015; Xuan, 2021). Consumers selectively pay attention to aspects of their environment that are relevant to them and that they are able to comprehend (Hoyer and MacInnis, 2007). Therefore, noticing a new product and visual attention depend on the consumer's knowledge and experience (Nassivera and Sillani, 2016; Samant and Seo, 2016a; Thøgersen and Zhou, 2012).

Sustainability claims can also affect quality perception when consumers have high levels of label understanding (Samant and Seo, 2016b). Therefore, sufficient knowledge seems to be a prerequisite for claims to effectively deliver information (Samant and Seo, 2016b) and a driver for consumer perception (Tansakul et al., 2018). Knowledge provision, for instance through educational interventions, can be an effective tool to help improve consumers' label understanding (Samant et al., 2016) and ultimately help consumers identify sustainable products (Schmidt, 2020).

Some researchers went as far as to argue that the current label situation fails to help consumers make informed choices for sustainable consumption (Goossens et al., 2017). Indeed, the presence of a label does not automatically enhance the perception of a product (Ertz et al., 2017), and it is important to note that consumers differentiate between different types of sustainability claims (Chen et al., 2018). Furthermore, it is crucial that consumers understand the label and that it allows for cross-product comparisons (Engels et al., 2010). Introduction of a cross-category label can help consumers make more accurate choices in terms of sustainability (Dihr et al., 2021). Consumers might choose product labels more frequently than other potential sources of information about their food (Howard and Allen, 2010), but the source must be trustworthy (Sirieix et al., 2013; Zepeda et al., 2013). Ultimately, a stable and transparent relationship between producers, distributors, and consumers should be built, assuring consumers that

they are purchasing high-quality products (Kusá et al., 2021). If trust is lost, labels can also suffer from negative publicity (Loureiro et al., 2002).

*3.3.4. Joint efforts within the food system*

The food environment is the physical, economic, political, and sociocultural context in which consumers engage with food (Drewnowski et al., 2020). In the current food environment, unhealthy and unsustainable products predominate. Policies should make healthy and sustainable foods the easy, affordable, and preferred choice. Although this review focused on consumer-targeted food policy instruments, it emerged across studies that all actors are required to take action (Drewnowski et al., 2020; Feucht and Zander, 2018; Yeğenoğlu et al., 2021).

Although *information-based instruments* such as information or educational campaigns and coherent and comprehensive labelling policies are frequently used policy instruments, they are not very effective on their own and do little to change consumer behaviour. Therefore, more intrusive instruments such as taxes or policies are required to additionally address the industry (Feucht and Zander, 2018; Gadema and Oglethorpe, 2011). Indeed, poor regulation was identified as one of the most important barriers to sustainable consumption (Shao, 2019). Mandatory measures (e.g., a $CO_2$ tax) among food system actors are therefore necessary to ensure widespread and simultaneous uptake (Gadema and Oglethorpe, 2011).

Successful instruments must have ambitious, clear, and quantifiable targets (Wolff et al., 2016). Furthermore, production and consumption should be understood as co-dependent parts of the food system that share cooperative efforts (Chen et al., 2018; Salmivaara and Lankoski, 2019). Consumers cannot take informed decisions if retailers do not provide the information necessary (Ekelund et al., 2014). Still, governmental and industry action in terms of policy instruments is required to reduce some of the barriers associated with buying sustainable products (Culliford and Bradbury, 2020), but lack of political will can be an important barrier (Abadie et al., 2016).

Mitigation of climate change is a societal and political aim, which means that policymakers are challenged to establish proper political structures (e.g., regulatory frameworks) to foster climate-friendly behaviour. This should be achieved at both the consumer and the industry and government levels (Feucht and Zander, 2018). Given the global scale of the problem, it is crucial for countries to learn from each other, especially because some policies are transferrable or easy to adopt across countries (Zaharia et al., 2021). Still, as outlined above, it is important to consider cultural differences when designing policy measures.

Initial approaches to strengthen cooperation between the actors within the food system and across the sector already exist. For instance, the new Farm-to-Fork strategy, which was set up by the European Commission, goes beyond the working together of actors and further combines policy domains, including food production, climate change, and biodiversity loss (de Boer and Aiking, 2021). A central goal of the strategy is the shift towards healthy and sustainable diets, which means that both individual (health) and societal (sustainability) benefits are addressed (De Bauw et al., 2021).

## 4. Limitations and outlook

As for all studies, the quality of this review is based on the quality of the data. The data obtained for a review on the other hand is defined by the search terms used. There is a thin line between choosing broad search terms that result in too many hits and using very specific search terms that may not cover the entirety of the data. Given the heterogeneity of the topic and the vocabulary used to describe sustainability, we are aware that we may not have covered all relevant papers. However, to the best of our knowledge, the described search terms cover the most important aspects and the described methodology makes the data collection transparent.

Future studies on sustainable consumption choices may want to specifically include all three pillars of sustainability. As our review has shown, multiple aspects beside environmental sustainability are important to consumers when making food choices. Health aspects are especially important when looking at diets, as diets can act as a link between environmental sustainability and human health (Tilman and Clark, 2014).

Another interesting avenue for future studies would be to compare in more detail the results of the various studies over time using a meta-analysis. Given that decades have been dedicated to research on sustainable food consumption, it might be interesting to see whether the results of these studies have changed over time. For instance, it could be hypothesised that the effect of a sustainability label has changed over time because consumers became more aware of the issue. Another important topic that deserves further investigation is the role of price. As identified herein, price is an important factor in the decision making. Therefore, the recent debate on true costs of food is increasing fast (Mirzabaev and von Braun, 2022; The Rockefeller Foundation, 2021) and should be monitored and analysed by future studies.

## 5. Conclusion

In this review, we analysed policy instruments for sustainable food consumption and found that overall, *less intrusive policy instruments (*i.e., *information-based, nudging) are more popular and widespread than more intrusive instruments.* We conclude that they are of utmost importance, especially because they can be combined with other instruments. Still, it must be noted that educating consumers alone is not enough to achieve a sustainable shift in consumption. More intrusive instruments, such as taxes (i.e., *market-based measures*) or the *regulatory* elimination of the most polluting products, are more effective and therefore needed to achieve substantial and lasting progress, and they can and should be combined with *information-based instruments.*

Two central drivers of food choice are taste and price. Producers and processors therefore need to make sure that products are also convincing in terms of taste, and the government needs to make sure (e.g., with taxes) that a product's price reflects the external costs of food, making sustainable products more attractive (in terms of price) as compared to conventional products. Another driver for sustainable food choice are sociodemographic characteristics such as gender and education level. To maximise the impact of policy measures, policy makers should adapt their measures and language to the target group and to focus on those consumer segments that have the most potential for improvement regarding sustainable consumption.

Finally, we found that a common understanding of sustainability is currently lacking. Given the complexity of the food system and sustainability, it is crucial to establish a common language to orchestrate efforts and jointly tackle the food sustainability challenge. There is no magic bullet that will make food consumption more sustainable. Instead, measures need to be tailored to their target audience, and policy instruments should be combined to complement each other and benefit from synergies. Although our review focused on consumers, we find that all actors along the food value chain and researchers from various disciplines are called upon to develop and test effective instruments and put them into action. The food system must be seen as more than the sum of its parts, with each part playing a central role in achieving the sustainability goals.

## Funding and acknowledgements

This research has not received any third-party funding.

## Declaration of competing interest

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

## Appendix 1

**Table A1**
Search strings used and number of results obtained for the three databases.

| | |
|---|---|
| Scopus (09.09.2021): 6930 results | |
| | TITLE-ABS(food) |
| AND | TITLE-ABS(consumer) |
| AND | TITLE-ABS(sustainab*) OR TITLE-ABS(environment*) OR TITLE-ABS(life cycle assessment) OR TITLE-ABS(biodiversity) OR TITLE-ABS(footprint) OR TITLE-ABS(carbon) OR TITLE-ABS(climate) |
| AND | TITLE-ABS(policy) OR TITLE-ABS(tax*) OR TITLE-ABS(prohib*) OR TITLE-ABS(restrict*) OR TITLE-ABS(ban*) OR TITLE-ABS(information) OR TITLE-ABS(nudg*) OR TITLE-ABS(label*) OR TITLE-ABS(behavio*) |
| Web of Science (09.09.2021): 5094 results | |
| | (AB = (food) OR TI = (food)) |
| AND | (AB = (consumer) OR TI = (consumer)) |
| AND | (AB = (sustainab* OR environment* OR life cycle assessment OR biodiversity OR footprint OR carbon OR climate) OR (TI = (sustainab* OR environment* OR life cycle assessment OR biodiversity OR footprint OR carbon OR climate))) |
| AND | (AB = (policy OR tax* OR prohib* OR restrict* OR ban* OR information OR nudg* OR label* OR behavio*) OR (TI = (policy OR tax* OR prohib* OR restrict* OR ban* OR information OR nudg* OR label* OR behavio*))) |
| PubMed (09.09.2021): 1123 results | |
| | (food[Title/Abstract]) |
| AND | (consumer[Title/Abstract]) |
| AND | (sustainab* OR environment* OR life cycle assessment OR biodiversity OR footprint OR carbon OR climate[Title/Abstract]) |
| AND | (policy OR tax* OR prohib* OR restrict* OR ban* OR information OR nudg* OR label* behavio*[Title/Abstract]) |

## Appendix 2

**Table A2**
Final list of papers included in the review.

| Information-based | |
|---|---|
| L1 | (Akaichi et al., 2016) |
| L2 | (Apostolidis and McLeay, 2019) |
| L3 | (Barker et al., 2019) |
| L4 | (Bellotti and Panzone, 2016) |
| L5 | (Berghoef and Dodds, 2011) |
| L6 | (Binnekamp and Ingenbleek, 2008) |
| L7 | (Biondi and Camanzi, 2020) |
| L8 | (Birkenberg et al., 2021) |
| L9 | (Bissinger, 2019) |
| L10 | (Calderon-Monge et al., 2020) |
| L11 | (Caputo et al., 2013a) |
| L12 | (Caputo et al., 2013b) |
| L13 | (Carrero et al., 2021) |
| L14 | (Chen et al., 2018) |
| L15 | (Cho and Baskin, 2018) |
| L16 | (Chuanmin et al., 2014) |
| L17 | (Culliford and Bradbury, 2020) |
| L18 | (Czeczotko et al., 2020) |
| L19 | (De Bauw et al., 2021) |
| L20 | (De Marchi et al., 2016) |
| L21 | (De Magistris et al., 2015) |
| L22 | (de-Magistris et al., 2017) |
| L23 | (Dihr et al., 2021) |
| L24 | (Do et al., 2021) |
| L25 | (Drichoutis et al., 2016) |
| L26 | (Durham et al., 2012) |
| L27 | (Echeverría et al., 2014) |
| L28 | (Edenbrandt and Lagerkvist, 2021) |
| L29 | (Edwards et al., 2013) |
| L30 | (Ekelund et al., 2014) |
| L31 | (Eldesouky et al., 2019) |
| L32 | (Eldesouky et al., 2020) |
| L33 | (Elofsson et al., 2016) |
| L34 | (Engels et al., 2010) |
| L35 | (Ertz et al., 2017) |
| L36 | (Feucht and Zander, 2018) |
| L37 | (Fröhlich et al., 2013) |
| L38 | (Gadema and Oglethorpe, 2011) |
| L39 | (Ghvanidze et al., 2017) |
| L40 | (Gisslevik et al., 2018) |
| L41 | (Goossens et al., 2017) |
| L42 | (Gorissen and Weijters, 2016) |
| L43 | (Grankvist and Biel, 2007) |
| L44 | (Grankvist et al., 2007) |
| L45 | (Grebitus et al., 2016) |
| L46 | (Grunert et al., 2014) |
| L47 | (Grymshi et al., 2021) |
| L48 | (Guenther et al., 2014) |
| L49 | (Hartikainen et al., 2014) |
| L50 | (Hoogland et al., 2007) |
| L51 | (Howard and Allen, 2010) |
| L52 | (Hsu et al., 2021) |
| L53 | (Hu et al., 2013) |
| L54 | (Huang et al., 2021) |
| L55 | (Jiang et al., 2019) |
| L56 | (Jin et al., 2018) |
| L57 | (Jo et al., 2019) |
| L58 | (Johnston et al., 2001) |
| L59 | (Kaczorowska et al., 2019) |
| L60 | (Kemp et al., 2010) |
| L61 | (Kimura et al., 2010) |
| L62 | (Koistinen et al., 2013) |
| L63 | (Kusá et al., 2021) |
| L64 | (Lampert et al., 2017) |
| L65 | (Lazzarini et al., 2018) |
| L66 | (Lehner, 2015) |
| L67 | (Liu et al., 2017) |
| L68 | (Lombardi et al., 2017) |
| L69 | (Loureiro et al., 2001) |
| L70 | (Loureiro et al., 2002) |
| L71 | (Mancini et al., 2017) |
| L72 | (Martin et al., 2021) |
| L73 | (Mazzocchi et al., 2019) |
| L74 | (Moon et al., 2016) |
| L75 | (Moon et al., 2002) |
| L76 | (Moscovici et al., 2020) |
| L77 | (Muller et al., 2019) |
| L78 | (Nassivera and Sillani, 2016) |
| L79 | (Osman and Thornton, 2019) |
| L80 | (Panzone et al., 2011) |
| L81 | (Panzone et al., 2020) |
| L82 | (Peschel, Grebitus et al., 2016) |
| L83 | (Plank and Teichmann, 2018) |
| L84 | (Pomarici and Vecchio, 2014) |
| L85 | (Pomarici et al., 2018) |
| L86 | (Prell et al., 2020) |
| L87 | (Redman and Redman, 2014) |
| L88 | (Reisch et al., 2021b) |
| L89 | (Richter et al., 2018) |
| L90 | (Rousseau, 2015) |
| L91 | (Salmivaara and Lankoski, 2019) |
| L92 | (Samant and Seo, 2016a) |
| L93 | (Samant and Seo, 2016b) |
| L94 | (Samant et al., 2016) |
| L95 | (Schmidt, 2020) |
| L96 | (Schmit et al., 2013) |
| L97 | (Schnettler et al., 2015) |
| L98 | (Shewmake et al., 2015) |
| L99 | (Silva et al., 2019) |
| L100 | (Silva et al., 2017) |
| L101 | (Simeone and Scarpato, 2020) |
| L102 | (Sirieix et al., 2013) |
| L103 | (Slapø and Karevold, 2019) |
| L104 | (Sogari et al., 2015) |
| L105 | (Spaargaren et al., 2013) |
| L106 | (Taillie et al., 2021) |
| L107 | (Tait et al., 2016a) |
| L108 | (Tait et al., 2016b) |

**Table A2** *(continued)*

| | |
|---|---|
| Information-based | |
| L109 | (Tansakul et al., 2018) |
| L110 | (Tian et al., 2021) |
| L111 | (van Giesen and Leenheer, 2019) |
| L112 | (Van Loo et al., 2015) |
| L113 | (Van Loo et al., 2014) |
| L114 | (Vecchio and Annunziata, 2015) |
| L115 | (Vecchio et al., 2015) |
| L116 | (Vlaeminck et al., 2014) |
| L117 | (Weber, 2021) |
| L118 | (Xu and Jeong, 2019) |
| L119 | (Xuan, 2021) |
| L120 | (Yang et al., 2021) |
| L121 | (Zepeda et al., 2013) |
| L122 | (Zhao et al., 2020) |
| L123 | (Zhou et al., 2017) |
| Market-based | |
| M1 | (Abadie et al., 2016) |
| M2 | (Broeks et al., 2020) |
| M3 | (Caillavet, F., Fadhuile, A., Nichèle, V.) |
| M4 | (Edjabou and Smed, 2013) |
| M5 | (Feng et al., 2010) |
| M6 | (Graça et al., 2020) |
| M7 | (Hoek et al., 2017) |
| M8 | (Kopainsky et al., 2020) |
| M9 | (Latka et al., 2021) |
| M10 | (Panzone et al., 2021) |
| M11 | (Renner et al., 2018) |
| Regulatory | |
| R1 | (Fabinyi, 2016) |
| R2 | (Wolff et al., 2016) |
| Nudges | |
| N1 | (Bartiaux and Salmón, 2012) |
| N2 | (Becchetti et al., 2020) |
| N3 | (Bschaden et al., 2020) |
| N4 | (Coucke et al., 2019) |
| N5 | (de Boer et al., 2013) |
| N6 | (de Boer et al., 2014) |
| N7 | (de Koning et al., 2016) |
| N8 | (Farmer et al., 2017) |
| N9 | (Filimonau et al., 2017) |
| N10 | (Hanss and Böhm, 2013) |
| N11 | (Jalil et al., 2020) |
| N12 | (Kaljonen et al., 2020) |
| N13 | (Maher and Burkhart, 2017) |
| N14 | (McBey et al., 2019) |
| N15 | (Monroe et al., 2015) |
| N16 | (Morren et al., 2021) |
| N17 | (Ohlhausen and Langen, 2020) |
| N18 | (Penz et al., 2019) |
| N19 | (Prusaczyk et al., 2021) |
| N20 | (Ramsing et al., 2021) |
| N21 | (Robinson et al., 2002) |
| N22 | (Spendrup et al., 2016) |
| N23 | (Wahlen et al., 2011) |
| N24 | (Maher and Burkhart, 2017) |

## References


Abadie, L.M., Galarraga, I., Milford, A.B., Gustavsen, G.W., 2016. Using food taxes and subsidies to achieve emission reduction targets in Norway. J. Clean. Prod. 134, 280–297. https://doi.org/10.1016/j.jclepro.2015.09.054.

Akaichi, F., de Grauw, S., Darmon, P., Revoredo-Giha, C., 2016. Does fair trade compete with carbon footprint and organic attributes in the eyes of Consumers? Results from a pilot study in Scotland, the Netherlands and France. J. Agric. Environ. Ethics 29 (6), 969–984. https://doi.org/10.1007/s10806-016-9642-7.

Apostolidis, C., McLeay, F., 2019. To meat or not to meat? Comparing empowered meat consumers' and anti-consumers' preferences for sustainability labels. Food Qual. Prefer. 77, 109–122. https://doi.org/10.1016/j.foodqual.2019.04.008.

Aprile, M.C., Caputo, V., Nayga Jr., R.M., 2012. Consumers' valuation of food quality labels: the case of the European geographic indication and organic farming labels. Int. J. Consum. Stud. 36 (2), 158–165. https://doi.org/10.1111/j.1470-6431.2011.01092.x.

Barker, M.E., Wong, F., Jones, C.R., Russell, J.M., 2019. Food purchasing decisions and environmental ideology: an exploratory survey of UK shoppers. Sustainability 11 (22). https://doi.org/10.3390/su11226279.

Bartiaux, F., Salmón, L.R., 2012. Are there domino effects between consumers' ordinary and 'green' practices? An analysis of quantitative data from a sensitisation campaign on personal carbon footprint. Int. Rev. Sociol. 22 (3), 471–491. https://doi.org/10.1080/03906701.2012.730825.

Becchetti, L., Salustri, F., Scaramozzino, P., 2020. Nudging and corporate environmental responsibility: a natural field experiment. Food Policy 97. https://doi.org/10.1016/j.foodpol.2020.101951.

Bellotti, E., Panzone, L., 2016. Media effects on sustainable food consumption. How newspaper coverage relates to supermarket expenditures. Int. J. Consum. Stud. 40 (2), 186–200. https://doi.org/10.1111/ijcs.12242.

Berghoef, N., Dodds, R., 2011. Potential for sustainability eco-labeling in Ontario's wine industry. Int. J. Wine Bus. Res. 23 (4), 298–317. https://doi.org/10.1108/17511061111186488.

Binnekamp, M., Ingenbleek, P., 2008. Do "good" food products make others look "bad"? Br. Food J. 110 (9), 843–864. https://doi.org/10.1108/00070700810900576.

Biondi, B., Camanzi, L., 2020. Nutrition, hedonic or environmental? The effect of front-of-pack messages on consumers' perception and purchase intention of a novel food product with multiple attributes. Food Res. Int. 130, 108962. https://doi.org/10.1016/j.foodres.2019.108962.

Birkenberg, A., Narjes, M.E., Weinmann, B., Birner, R., 2021. The potential of carbon neutral labeling to engage coffee consumers in climate change mitigation. J. Clean. Prod. 278. https://doi.org/10.1016/j.jclepro.2020.123621.

Bissinger, K., 2019. Sustainability labels: are Price premia relevant in online food retailing? J. Int. Food Agribusiness Mark. 31 (3), 255–272. https://doi.org/10.1080/08974438.2018.1520177.

Broeks, M.J., Biesbroek, S., Over, E.A.B., van Gils, P.F., Toxopeus, I., Beukers, M.H., Temme, E.H.M., 2020. A social cost-benefit analysis of meat taxation and a fruit and vegetables subsidy for a healthy and sustainable food consumption in the Netherlands. BMC Public Health 20 (1), 643. https://doi.org/10.1186/s12889-020-08590-z.

Bschaden, A., Mandarano, E., Stroebele-Benschop, N., 2020. Effects of a documentary on consumer perception of the environmental impact of meat consumption. Br. Food J. 123 (1), 177–189. https://doi.org/10.1108/bfj-02-2020-0138.

Caillavet, F., Fadhuile, A., Nichèle, V., 2016. Taxing animal-based foods for sustainability: environmental, nutritional and social perspectives in France. Eur. Rev. Agric. Econ. 43 (4), 537–560. https://doi.org/10.1093/erae/jbv041.

Calderon-Monge, E., Redondo-Rodriguez, R.-G., Ramírez-Hurtado, J.M., 2020. Narrowing the gap between consumer purchasing intention and behaviour through ecolabelling: a challenge for eco-entrepreneurism. Br. Food J. 123 (10), 3293–3308. https://doi.org/10.1108/bfj-09-2020-0874.

Caputo, V., Nayga, R.M., Scarpa, R., 2013a. Food miles or carbon emissions? Exploring labelling preference for food transport footprint with a stated choice study. Aust. J. Agric. Resour. Econ. 57 (4), 465–482. https://doi.org/10.1111/1467-8489.12014.

Caputo, V., Vassilopoulos, A., Nayga, R.M., Canavari, M., 2013b. Welfare effects of food miles labels. J. Consum. Aff. 47 (2), 311–327. https://doi.org/10.1111/joca.12009.

Carrero, I., Valor, C., Díaz, E., Labajo, V., 2021. Designed to be noticed: a reconceptualization of carbon food labels as warning labels. Sustainability 13 (3). https://doi.org/10.3390/su13031581.

Chen, X., Gao, Z., Swisher, M., House, L., Zhao, X., 2018. Eco-labeling in the fresh produce market: not all environmentally friendly labels are equally valued. Ecol. Econ. 154, 201–210. https://doi.org/10.1016/j.ecolecon.2018.07.014.

Cho, Y.-N., Baskin, E., 2018. It's a match when green meets healthy in sustainability labeling. J. Bus. Res. 86, 119–129. https://doi.org/10.1016/j.jbusres.2018.01.050.

Chuanmin, S., Xiaomin, Y., Yukun, Z., Chuanxi, S., Penghui, D., 2014. Consumer behaviour on low-carbon Agri-food purchase: a carbon labelling experimental study in China. Agric. Econ.-Czech. 60 (3), 133–146.

Coucke, N., Vermeir, I., Slabbinck, H., Van Kerckhove, A., 2019. Show me More! The influence of visibility on sustainable food choices. Foods 8 (6). https://doi.org/10.3390/foods8060186.

Culliford, A., Bradbury, J., 2020. A cross-sectional survey of the readiness of consumers to adopt an environmentally sustainable diet. Nutr. J. 19 (1), 138. https://doi.org/10.1186/s12937-020-00644-7.

Czeczotko, M., Górska-Warsewicz, H., Laskowski, W., 2020. Towards sustainable private labels—what is the consumer behavior relating to private labels in the UK and Poland? Sustainability 12 (15). https://doi.org/10.3390/su12156035.

De Bauw, M., Matthys, C., Poppe, V., Franssens, S., Vranken, L., 2021. A combined nutriscore and 'eco-score' approach for more nutritious and more environmentally friendly food choices? Evidence from a consumer experiment in Belgium. Food Qual. Prefer. 93. https://doi.org/10.1016/j.foodqual.2021.104276.

de Boer, J., Aiking, H., 2021. Climate change and species decline: distinct sources of european consumer concern supporting more sustainable diets. Ecol. Econ. 188. https://doi.org/10.1016/j.ecolecon.2021.107141.

de Boer, J., Schösler, H., Boersema, J.J., 2013. Climate change and meat eating: an inconvenient couple? J. Environ. Psychol. 33, 1–8. https://doi.org/10.1016/j.jenvp.2012.09.001.

de Boer, J., Schosler, H., Aiking, H., 2014. "Meatless days" or "less but better"? Exploring strategies to adapt Western meat consumption to health and sustainability challenges. Appetite 76, 120–128. https://doi.org/10.1016/j.appet.2014.02.002.

de Koning, J.I.J.C., Ta, T.H., Crul, M.R.M., Wever, R., Brezet, J.C., 2016. GetGreen Vietnam: towards more sustainable behaviour among the urban middle class. J. Clean. Prod. 134, 178–190. https://doi.org/10.1016/j.jclepro.2016.01.063.

De Magistris, T., Del Giudice, T., Verneau, F., 2015. The effect of information on willingness to pay for canned tuna fish with different corporate social responsibility (CSR)

certification: a pilot study. J. Consum. Aff. 49 (2), 457–471. https://doi.org/10.1111/joca.12046.
De Marchi, E., Caputo, V., Nayga, R.M., Banterle, A., 2016. Time preferences and food choices: evidence from a choice experiment. Food Policy 62, 99–109. https://doi.org/10.1016/j.foodpol.2016.05.004.
de-Magistris, T., Gracia, A., Barreiro-Hurle, J., 2017. Do consumers care about European food labels? An empirical evaluation using best-worst method. British Food Journal 119 (12), 2698–2711. https://doi.org/10.1108/bfj-11-2016-0562.
Diekmann, A., Preisendörfer, P., 2003. Green and greenback: the behavioral effects of environmental attitudes in low-cost and high-cost situations. Ration. Soc. 15 (4), 441–472. https://doi.org/10.1177/1043463103154002.
Diepeveen, S., Ling, T., Suhrcke, M., Roland, M., Marteau, T.M., 2013. Public acceptability of government intervention to change health-related behaviours: a systematic review and narrative synthesis. BMC Public Health 13 (756).
Dihr, M., Berthold, A., Siegrist, M., Sütterlin, B., 2021. Consumers' knowledge gain through a cross-category environmental label. J. Clean. Prod. 319. https://doi.org/10.1016/j.jclepro.2021.128688.
Dixon, J., Isaacs, B., 2013. Why sustainable and 'nutritionally correct' food is not on the agenda: Western Sydney, the moral arts of everyday life and public policy. Food Policy 43, 67–76. https://doi.org/10.1016/j.foodpol.2013.08.010.
Do, K.T., Wang, C.Y., Guchait, P., 2021. When normative framing saves Mr. Nature: role of consumer efficacy in proenvironmental adoption. Psychol. Mark. 38 (8), 1340–1362. https://doi.org/10.1002/mar.21486.
Dollery, B.E., Wallis, J.L., 1997. Market failure, government failure, leadership and public policy. J. Interdiscip. Econ. 8 (2), 113–126. https://doi.org/10.1177/02601079X9700800202.
Drewnowski, A., Monterrosa, E.C., de Pee, S., Frongillo, E.A., Vandevijvere, S., 2020. Shaping physical, economic, and policy components of the food environment to create sustainable healthy diets. Food Nutr. Bull. 41 (2_suppl), 74S–86S. https://doi.org/10.1177/0379572120945904.
Drichoutis, A.C., Lusk, J.L., Pappa, V., 2016. Elicitation formats and the WTA/WTP gap: a study of climate neutral foods. Food Policy 61, 141–155. https://doi.org/10.1016/j.foodpol.2016.03.001.
Durham, C.A., Roheim, C.A., Pardoe, I., 2012. Picking apples: can multi-attribute ecolabels compete? J. Agric. Food Ind. Organ. 10 (1). https://doi.org/10.1515/1542-0485.1372.
Echeverría, R., Hugo Moreira, V., Sepúlveda, C., Wittwer, C., 2014. Willingness to pay for carbon footprint on foods. Br. Food J. 116 (2), 186–196. https://doi.org/10.1108/bfj-07-2012-0292.
Edenbrandt, A.K., Lagerkvist, C.-J., 2021. Is food labelling effective in reducing climate impact by encouraging the substitution of protein sources? Food Policy 101. https://doi.org/10.1016/j.foodpol.2021.102097.
Edjabou, L.D., Smed, S., 2013. The effect of using consumption taxes on foods to promote climate friendly diets – the case of Denmark. Food Policy 39, 84–96. https://doi.org/10.1016/j.foodpol.2012.12.004.
Edwards, S., Skouteris, H., Rutherford, L., Cutter-Mackenzie, A., 2013. 'It's all about Ben10™': children's play, health and sustainability decisions in the early years. Early Child Dev. Care 183 (2), 280–293. https://doi.org/10.1080/03004430.2012.671816.
Ekelund, L., Hunter, E., Spendrup, S., Tjärnemo, H., 2014. Communicating GHG mitigating food consumption in-store. Br. Food J. 116 (10), 1618–1635. https://doi.org/10.1108/bfj-03-2013-0075.
Eldesouky, A., Mesias, F.J., Escribano, M., 2019. Perception of Spanish consumers towards environmentally friendly labelling in food. Int. J. Consum. Stud. 44 (1), 64–76. https://doi.org/10.1111/ijcs.12546.
Eldesouky, A., Mesias, F.J., Escribano, M., 2020. Consumer assessment of sustainability traits in meat production. A choice experiment study in Spain. Sustainability 12 (10). https://doi.org/10.3390/su12104093.
Elofsson, K., Bengtsson, N., Matsdotter, E., Arntyr, J., 2016. The impact of climate information on milk demand: evidence from a field experiment. Food Policy 58, 14–23. https://doi.org/10.1016/j.foodpol.2015.11.002.
Engels, S.V., Hansmann, R., Scholz, R.W., 2010. Toward a sustainability label for food products: an analysis of experts' and consumers' acceptance. Ecol. Food Nutr. 49 (1), 30–60. https://doi.org/10.1080/03670240903433154.
Ertz, M., François, J., Durif, F., 2017. How consumers react to environmental information: an experimental study. J. Int. Consum. Mark. 29 (3), 162–178. https://doi.org/10.1080/08961530.2016.1273813.
Fabinyi, M., 2016. Sustainable seafood consumption in China. Mar. Policy 74, 85–87. https://doi.org/10.1016/j.marpol.2016.09.020.
Fanzo, J., Haddad, L., Schneider, K.R., Béné, C., Covic, N.M., Guarin, A., Herforth, A.W., Herrero, M., Sumaila, U.R., Aburto, N.J., Amuyunzu-Nyamongo, M., Barquera, S., Battersby, J., Beal, T., Bizzotto Molina, P., Brusset, E., Cafiero, C., Campeau, C., Caron, P., Cattaneo, A., Conforti, P., Davis, C., DeClerck, F.A.J., Elouafi, I., Fabi, C., Gephart, J.A., Golden, C.D., Hendriks, S.L., Huang, J., Laar, A., Lal, R., Lidder, P., Loken, B., Marshall, Q., Masuda, Y.J., McLaren, R., Neufeld, L.M., Nordhagen, S., Remans, R., Resnick, D., Silverberg, M., Torero Cullen, M., Tubiello, F.N., Vivero-Pol, J.-L., Wei, S., Rosero Moncayo, J., 2021. Viewpoint: rigorous monitoring is necessary to guide food system transformation in the countdown to the 2030 global goals. Food Policy 104. https://doi.org/10.1016/j.foodpol.2021.102163.
FAO, 2012f. Sustainable diets and biodiversity: directions and solutions for policy, research and action.
FAO, 2020. Emissions due to agriculture. Global, regional and country trends 2000–2018.
Farmer, A., Breazeale, M., Stevens, J.L., Waites, S.F., 2017. Eat green, get lean: promoting sustainability reduces consumption. J. Public Policy Mark. 36 (2), 299–312. https://doi.org/10.1509/jppm.16.087.
Feng, K., Hubacek, K., Guan, D., Contestabile, M., Minx, J., Barrett, J., 2010. Distributional effects of climate change taxation. Environ. Sci. Technol. 44 (10). https://doi.org/10.1021/es902974g.
Feucht, Y., Zander, K., 2018. Consumers' preferences for carbon labels and the underlying reasoning. A mixed methods approach in 6 european countries. J. Clean. Prod. 178, 740–748. https://doi.org/10.1016/j.jclepro.2017.12.236.
Filimonau, V., Lemmer, C., Marshall, D., Bejjani, G., 2017. 'Nudging' as an architect of more responsible consumer choice in food service provision: the role of restaurant menu design. J. Clean. Prod. 144, 161–170. https://doi.org/10.1016/j.jclepro.2017.01.010.
Fröhlich, G., Sellmann, D., Bogner, F.X., 2013. The influence of situational emotions on the intention for sustainable consumer behaviour in a student-centred intervention. Environ. Educ. Res. 19 (6), 747–764. https://doi.org/10.1080/13504622.2012.749977.
Funke, F., Mattauch, L., van den Bijaart, I., Godfray, C., Hepburn, C., Klenert, D., Springmann, M., Treich, N., 2021. Is meat too cheap? Towards optimal meat taxation. SSRN Electronic Journal https://doi.org/10.2139/ssrn.3801702.
Gadema, Z., Oglethorpe, D., 2011. The use and usefulness of carbon labelling food: a policy perspective from a survey of UK supermarket shoppers. Food Policy 36 (6), 815–822. https://doi.org/10.1016/j.foodpol.2011.08.001.
Ghvanidze, S., Velikova, N., Dodd, T., Oldewage-Theron, W., 2017. A discrete choice experiment of the impact of consumers' environmental values, ethical concerns, and health consciousness on food choices. Br. Food J. 119 (4), 863–881. https://doi.org/10.1108/bfj-07-2016-0342.
Girod, B., van Vuuren, D.P., Hertwich, E.G., 2014. Climate policy through changing consumption choices: options and obstacles for reducing greenhouse gas emissions. Glob. Environ. Chang. 25, 5–15. https://doi.org/10.1016/j.gloenvcha.2014.01.004.
Gisslevik, E., Wernersson, I., Larsson, C., 2018. Pupils' participation in and response to sustainable food education in Swedish home and consumer studies: a case-study. Scand. J. Educ. Res. 63 (4), 585–604. https://doi.org/10.1080/00313831.2017.1415965.
Goossens, Y., Berrens, P., Charleer, L., Coremans, P., Houbrechts, M., Vervaet, C., De Tavernier, J., Geeraerd, A., 2017. Qualitative assessment of eco-labels on fresh produce in Flanders (Belgium) highlights a potential intention–performance gap for the supply chain. J. Clean. Prod. 140, 986–995. https://doi.org/10.1016/j.jclepro.2016.05.063.
Gorissen, K., Weijters, B., 2016. The negative footprint illusion: perceptual bias in sustainable food consumption. J. Environ. Psychol. 45, 50–65. https://doi.org/10.1016/j.jenvp.2015.11.009.
Graça, J., Cardoso, S.G., Augusto, F.R., Nunes, N.C., 2020. Green light for climate-friendly food transitions? Communicating legal innovation increases consumer support for meat curtailment policies. Environ. Commun. 14 (8), 1047–1060. https://doi.org/10.1080/17524032.2020.1764996.
Grankvist, G., Biel, A., 2007. Predictors of purchase of eco-labelled food products: a panel study. Food Qual. Prefer. 18 (4), 701–708. https://doi.org/10.1016/j.foodqual.2006.11.002.
Grankvist, G., Lekedal, H., Marmendal, M., 2007. Values and eco- and fair-trade labelled products. Br. Food J. 109 (2), 169–181. https://doi.org/10.1108/00070700710725527.
Grebitus, C., Steiner, B., Veeman, M.M., 2016. Paying for sustainability: a cross-cultural analysis of consumers' valuations of food and non-food products labeled for carbon and water footprints. J. Behav. Exp. Econ. 63, 50–58. https://doi.org/10.1016/j.socec.2016.05.003.
Grunert, K.G., Hieke, S., Wills, J., 2014. Sustainability labels on food products: consumer motivation, understanding and use. Food Policy 44, 177–189. https://doi.org/10.1016/j.foodpol.2013.12.001.
Grymshi, D., Crespo-Cebada, E., Elghannam, A., Mesías, F.J., Díaz-Caro, C., 2021. Understanding consumer attitudes towards ecolabeled food products: a latent class analysis regarding their purchasing motivations. Agribusiness. https://doi.org/10.1002/agr.21714.
Guenther, M., Saunders, C.M., Tait, P.R., 2014. Carbon labeling and consumer attitudes. Carbon Manage. 3 (5), 445–455. https://doi.org/10.4155/cmt.12.50.
Gürsoy, S.I., 2022. Food policy. In: Wernaart, B., van der Meulen, B. (Eds.), Applied Food science https://doi.org/10.3920/978-90-8686-933-6_5.
Hanss, D., Böhm, G., 2013. Promoting purchases of sustainable groceries: an intervention study. J. Environ. Psychol. 33, 53–67. https://doi.org/10.1016/j.jenvp.2012.10.002.
Hartikainen, H., Roininen, T., Katajajuuri, J.-M., Pulkkinen, H., 2014. Finnish consumer perceptions of carbon footprints and carbon labelling of food products. J. Clean. Prod. 73, 285–293. https://doi.org/10.1016/j.jclepro.2013.09.018.
Hoek, A.C., Pearson, D., James, S.W., Lawrence, M.A., Friel, S., 2017. Healthy and environmentally sustainable food choices: consumer responses to point-of-purchase actions. Food Qual. Prefer. 58, 94–106. https://doi.org/10.1016/j.foodqual.2016.12.008.
Hoogland, C.T., de Boer, J., Boersema, J.J., 2007. Food and sustainability: do consumers recognize, understand and value on-package information on production standards? Appetite 49 (1), 47–57. https://doi.org/10.1016/j.appet.2006.11.009.
Howard, P.H., Allen, P., 2010. Beyond organic and fair Trade? An analysis of ecolabel preferences in the United States. Rural. Sociol. 75 (2), 244–269. https://doi.org/10.1111/j.1549-0831.2009.00009.x.
Hoyer, W.D., MacInnis, D.J., 2007. Consumer Behavior. Houghton Mifflin Company. https://books.google.ch/books?id=CgAgQAAACAAJ.
Hsu, H.-W., Chen, C.-Y., Wu, C.-W., 2021. Cross-cultural comparison of sustainable agro-food consumption from consumers' perspectives: cases from Taiwan and France. Sustainability 13 (17). https://doi.org/10.3390/su13179733.
Hu, M.-L.M., Horng, J.-S., Teng, C.-C., Chiou, W.-B., Yen, C.-D., 2013. Fueling green dining intention: the self-completion theory perspective. Asia Pac. J. Tour. Res. 19 (7), 793–808. https://doi.org/10.1080/10941665.2013.806941.
Huang, Y., Yang, X., Li, X., Chen, Q., 2021. Less is better: how nutrition and low-carbon labels jointly backfire on the evaluation of food products. Nutrients 13 (4). https://doi.org/10.3390/nu13041088.

Jalil, A.J., Tasoff, J., Bustamante, A.V., 2020. Eating to save the planet: evidence from a randomized controlled trial using individual-level food purchase data. Food Policy 95. https://doi.org/10.1016/j.foodpol.2020.101950.

Jiang, Y., Wang, H., Jin, S., Delgado, M., 2019. The promising effect of a green food label in the new online market. Sustainability 11 (3). https://doi.org/10.3390/su11030796.

Jiang, G., Ameer, K., Kim, H., Lee, E.J., Ramachandraiah, K., Hong, G.P., 2020. Strategies for sustainable substitution of livestock meat. Foods 9 (9). https://doi.org/10.3390/foods9091227.

Jin, J., Dou, X., Meng, L., Yu, H., 2018. Environmental-friendly eco-labeling matters: evidences from an ERPs study. Front. Hum. Neurosci. 12, 417. https://doi.org/10.3389/fnhum.2018.00417.

Jo, J.-H., Yang, J.Y., Roh, T., 2019. Willingness to pay for eco-labeled food in forests: integrated view from South Korea. Sustainability 11 (23). https://doi.org/10.3390/su11236534.

Johnson, J.M., Franzluebbers, A.J., Weyers, S.L., Reicosky, D.C., 2007. Agricultural opportunities to mitigate greenhouse gas emissions. Environ. Pollut. 150 (1), 107–124. https://doi.org/10.1016/j.envpol.2007.06.030.

Johnston, R.J., Wessells, C.R., Donath, H., Asche, F., 2001. Measuring consumer preferences for ecolabeled seafood: an international comparison. J. Agric. Resour. Econ. 26 (1), 20–39.

Kaczorowska, J., Rejman, K., Halicka, E., Szczebyło, A., Górska-Warsewicz, H., 2019. Impact of food sustainability labels on the perceived product value and Price expectations of urban consumers. Sustainability 11 (24). https://doi.org/10.3390/su11247240.

Kaljonen, M., Salo, M., Lyytimäki, J., Furman, E., 2020. From isolated labels and nudges to sustained tinkering: assessing long-term changes in sustainable eating at a lunch restaurant. Br. Food J. 122 (11), 3313–3329. https://doi.org/10.1108/bfj-10-2019-0816.

Kemp, K., Insch, A., Holdsworth, D.K., Knight, J.G., 2010. Food miles: do UK consumers actually care? Food Policy 35 (6), 504–513. https://doi.org/10.1016/j.foodpol.2010.05.011.

Kimura, A., Wada, Y., Kamada, A., Masuda, T., Okamoto, M., Goto, S., Tsuzuki, D., Cai, D., Oka, T., Dan, I., 2010. Interactive effects of carbon footprint information and its accessibility on value and subjective qualities of food products. Appetite 55 (2), 271–278. https://doi.org/10.1016/j.appet.2010.06.013.

Koistinen, L., Pouta, E., Heikkilä, J., Forsman-Hugg, S., Kotro, J., Mäkelä, J., Niva, M., 2013. The impact of fat content, production methods and carbon footprint information on consumer preferences for minced meat. Food Qual. Prefer. 29 (2), 126–136. https://doi.org/10.1016/j.foodqual.2013.03.007.

Kopainsky, B., Frehner, A., Müller, A., 2020. Sustainable and healthy diets: synergies and trade-offs in Switzerland. Syst. Res. Behav. Sci. 37 (6), 908–927. https://doi.org/10.1002/sres.2761.

Kourouniotis, S., Keast, R.S.J., Riddell, L.J., Lacy, K., Thorpe, M.G., Cicerale, S., 2016. The importance of taste on dietary choice, behaviour and intake in a group of young adults. Appetite 103, 1–7. https://doi.org/10.1016/j.appet.2016.03.015.

Kusá, A., Urmínová, M., Darázs, T., Šalgovičová, J., 2021. Testing of standardized advertising slogans within the marketing communication of sustainable and local foods in order to reveal consumer preferences. Front. Sustain. Food Syst. 5. https://doi.org/10.3389/fsufs.2021.703223.

Lampert, P., Menrad, K., Emberger-Klein, A., 2017. Carbon information on vegetables: how does it affect the buying process? Int. J. Consum. Stud. 41 (6), 618–626. https://doi.org/10.1111/ijcs.12375.

Lang, T., 2009. Reshaping the food system for ecological public health. J. Hunger Environ. Nutr. 4 (3–4), 315–335. https://doi.org/10.1080/19320240903321227.

Latka, C., Kuiper, M., Frank, S., Heckelei, T., Havlík, P., Witzke, H.-P., Leip, A., Cui, H.D., Kuijsten, A., Geleijnse, J.M., van Dijk, M., 2021. Paying the price for environmentally sustainable and healthy EU diets. Glob. Food Sec. 28. https://doi.org/10.1016/j.gfs.2020.100437.

Lazzarini, G.A., Visschers, V.H.M., Siegrist, M., 2018. How to improve consumers' environmental sustainability judgements of foods. J. Clean. Prod. 198, 564–574. https://doi.org/10.1016/j.jclepro.2018.07.033.

Lee, A., Patay, D., Herron, L.M., Parnell Harrison, E., Lewis, M., 2021. Affordability of current, and healthy, more equitable, sustainable diets by area of socioeconomic disadvantage and remoteness in Queensland: insights into food choice. Int. J. Equity Health 20 (1), 153. https://doi.org/10.1186/s12939-021-01481-8.

Lehner, M., 2015. Retail store influence on sustainable consumption behaviour. Int. J. Qual. Serv. Sci. 7 (4), 404–423. https://doi.org/10.1108/ijqss-05-2014-0031.

Liu, Q., Yan, Z., Zhou, J., 2017. Consumer choices and motives for eco-labeled products in China: an empirical analysis based on the choice experiment. Sustainability 9 (3). https://doi.org/10.3390/su9030331.

Lombardi, G.V., Berni, R., Rocchi, B., 2017. Environmental friendly food. Choice experiment to assess consumer's attitude toward "climate neutral" milk: the role of communication. J. Clean. Prod. 142, 257–262. https://doi.org/10.1016/j.jclepro.2016.05.125.

Lorenz-Walther, B.A.S., Langen, N., 2020. Sustainable changes in a worksite canteen: an exploratory study on the acceptance of guests. J. Clean. Prod. 259. https://doi.org/10.1016/j.jclepro.2020.120737.

Loureiro, M.L., Lotade, J., 2005. Do fair trade and eco-labels in coffee wake up the consumer conscience? Ecol. Econ. 53 (1), 129–138. https://doi.org/10.1016/j.ecolecon.2004.11.002.

Loureiro, M.L., McCluskey, J.J., Mittelhammer, R.C., 2001. Assessing consumer preferences for organic, eco-labeled, and regular apples. J. Agric. Resour. Econ. 26 (2), 404–416.

Loureiro, M.L., McCluskey, J.J., Mittelhammer, R.C., 2002. Will consumers pay a premium for eco-labeled apples? J. Consum. Aff. 36 (2).

Maher, J., Burkhart, S., 2017. Experiential learning for engaging nutrition undergraduates with sustainability. Int. J. Sustain. High. Educ. 18 (7), 1108–1122. https://doi.org/10.1108/ijshe-01-2016-0010.

Mancini, P., Marchini, A., Simeone, M., 2017. Which are the sustainable attributes affecting the real consumption behaviour? Consumer understanding and choices. Br. Food J. 119 (8), 1839–1853. https://doi.org/10.1108/bfj-11-2016-0574.

Martin, C., Lange, C., Marette, S., 2021. Importance of additional information, as a complement to information coming from packaging, to promote meat substitutes: a case study on a sausage based on vegetable proteins. Food Qual. Prefer. 87. https://doi.org/10.1016/j.foodqual.2020.104058.

Mazzocchi, C., Ruggeri, G., Corsi, S., 2019. Consumers' preferences for biodiversity in vineyards: a choice experiment on wine. Wine Econ. Policy 8 (2), 155–164. https://doi.org/10.1016/j.wep.2019.09.002.

McBey, D., Watts, D., Johnstone, A.M., 2019. Nudging, formulating new products, and the lifecourse: a qualitative assessment of the viability of three methods for reducing Scottish meat consumption for health, ethical, and environmental reasons. Appetite 142, 104349. https://doi.org/10.1016/j.appet.2019.104349.

Mirzabaev, A., von Braun, J., 2022. True cost of food and land degradation. Russian. J. Econ. 8 (1), 7–15. https://doi.org/10.32609/j.ruje.8.78376.

Moher, D., Liberati, A., Tetzlaff, J., Altman, D.G., Group, P., 2009. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. PLoS Med 6 (7), e1000097. https://doi.org/10.1371/journal.pmed.1000097.

Monroe, J.T., Lofgren, I.E., Sartini, B.L., Greene, G.W., 2015. The Green Eating Project: web-based intervention to promote environmentally conscious eating behaviours in US university students. Public Health Nutr. 18 (13), 2368–2378. https://doi.org/10.1017/S1368980015002396.

Moon, S.-J., Costello, J.P., Koo, D.-M., 2016. The impact of consumer confusion from eco-labels on negative WOM, distrust, and dissatisfaction. Int. J. Advert. 36 (2), 246–271. https://doi.org/10.1080/02650487.2016.1158223.

Moon, W., Florkowski, W.J., Brückner, B., Schonhof, I., 2002. Willingness to pay for environmental practices: implications for eco-labelling. Land Econ. 78 (1), 88–102.

Morren, M., Mol, J.M., Blasch, J.E., Malek, Ž., 2021. Changing diets - testing the impact of knowledge and information nudges on sustainable dietary choices. J. Environ. Psychol. 75. https://doi.org/10.1016/j.jenvp.2021.101610.

Moscovici, D., Rezwanul, R., Mihailescu, R., Gow, J., Ugaglia, A.A., Valenzuela, L., Rinaldi, A., 2020. Preferences for eco certified wines in the United States. Int. J. Wine Bus. Res. 33 (2), 153–175. https://doi.org/10.1108/ijwbr-04-2020-0012.

Muller, L., Lacroix, A., Ruffieux, B., 2019. Environmental labelling and consumption changes: a food choice experiment. Environ. Resour. Econ. 73 (3), 871–897. https://doi.org/10.1007/s10640-019-00328-9.

Nassivera, F., Sillani, S., 2016. Consumer behavior toward eco-labeled minimally processed fruit product. J. Int. Food Agribusiness Mark. 29 (1), 29–45. https://doi.org/10.1080/08974438.2016.1241734.

NSW Department of Industry, 2017. Market failure guide - A guide to categorising market failures for government policy development and evaluation. . https://media.opengov.nsw.gov.au/pairtree_root/41/eb/7e/1a/65/1b/4e/a2/b8/d8/68/9a/1d/8d/75/1a/obj/PUB17_509_Market__failure_guide.pdf.

Ohlhausen, P., Langen, N., 2020. When a combination of nudges decreases sustainable food choices out-of-home-the example of food decoys and descriptive name labels. Foods 9 (5). https://doi.org/10.3390/foods9050557.

Osman, M., Thornton, K., 2019. Traffic light labelling of meals to promote sustainable consumption and healthy eating. Appetite 138, 60–71. https://doi.org/10.1016/j.appet.2019.03.015.

Panzone, L., Perino, G., Swanson, T., Leung, D., 2011. Testing for the best instrument to generate sustainable food consumption. Int. J. Food Syst. Dyn. 2 (3), 237–252.

Panzone, L., Sniehotta, F.F., Comber, R., Lemke, F., 2020. The effect of traffic-light labels and time pressure on estimating kilocalories and carbon footprint of food. Appetite 155, 104794. https://doi.org/10.1016/j.appet.2020.104794.

Panzone, L., Ulph, A., Zizzo, D.J., Hilton, D., Clear, A., 2021. The impact of environmental recall and carbon taxation on the carbon footprint of supermarket shopping. J. Environ. Econ. Manag. 109. https://doi.org/10.1016/j.jeem.2018.06.002.

Penz, E., Hartl, B., Hofmann, E., 2019. Explaining consumer choice of low carbon footprint goods using the behavioral spillover effect in German-speaking countries. J. Clean. Prod. 214, 429–439. https://doi.org/10.1016/j.jclepro.2018.12.270.

Peschel, A.O., Grebitus, C., Steiner, B., Veeman, M., 2016. How does consumer knowledge affect environmentally sustainable choices? Evidence from a cross-country latent class analysis of food labels. Appetite 106, 78–91. https://doi.org/10.1016/j.appet.2016.02.162.

Plank, A., Teichmann, K., 2018. A facts panel on corporate social and environmental behavior: decreasing information asymmetries between producers and consumers through product labeling. J. Clean. Prod. 177, 868–877. https://doi.org/10.1016/j.jclepro.2017.12.195.

Pomarici, E., Vecchio, R., 2014. Millennial generation attitudes to sustainable wine: an exploratory study on Italian consumers. J. Clean. Prod. 66, 537–545. https://doi.org/10.1016/j.jclepro.2013.10.058.

Pomarici, E., Asioli, D., Vecchio, R., Næs, T., 2018. Young consumers' preferences for water-saving wines: an experimental study. Wine Econ. Policy 7 (1), 65–76. https://doi.org/10.1016/j.wep.2018.02.002.

Prell, M., Zanini, M.T., Caldieraro, F., Migueles, C., 2020. Sustainability certifications and product preference. Mark. Intell. Plan. 38 (7), 893–906. https://doi.org/10.1108/mip-12-2019-0616.

Prusaczyk, E., Earle, M., Hodson, G., 2021. A brief nudge or education intervention delivered online can increase willingness to order a beef-mushroom burger. Food Qual. Prefer. 87. https://doi.org/10.1016/j.foodqual.2020.104045.

Purvis, B., Mao, Y., Robinson, D., 2018. Three pillars of sustainability: in search of conceptual origins. Sustain. Sci. 14 (3), 681–695. https://doi.org/10.1007/s11625-018-0627-5.

Ramsing, R., Chang, K., Hendrickson, Z., Xu, Z., Friel, M., Calves, E., 2021. Community engagement and the promotion of sustainable diets: lessons from a grassroots meat

reduction campaign. J. Agric. Food Syst. Community Dev. 10 (2), 1–25. https://doi.org/10.5304/jafscd.2021.102.026.
Redman, E., Redman, A., 2014. Transforming sustainable food and waste behaviors by realigning domains of knowledge in our education system. J. Clean. Prod. 64, 147–157. https://doi.org/10.1016/j.jclepro.2013.09.016.
Reisch, L., Eberle, U., Lorek, S., 2017. Sustainable food consumption: an overview of contemporary issues and policies. Sustain.: Sci. Pract. Policy 9 (2), 7–25. https://doi.org/10.1080/15487733.2013.11908111.
Reisch, L.A., Sunstein, C.R., Andor, M.A., Doebbe, F.C., Meier, J., Haddaway, N.R., 2021a. Mitigating climate change via food consumption and food waste: a systematic map of behavioral interventions. J. Clean. Prod. 279. https://doi.org/10.1016/j.jclepro.2020.123717.
Reisch, L., Sunstein, C.R., Kaiser, M., 2021b. What do people want to know? Information avoidance and food policy implications. Food Policy 102. https://doi.org/10.1016/j.foodpol.2021.102076.
Renner, S., Lay, J., Greve, H., 2018. Household welfare and CO2 emission impacts of energy and carbon taxes in Mexico. Energy Econ. 72, 222–235. https://doi.org/10.1016/j.eneco.2018.04.009.
Reynolds, C.J., Buckley, J.D., Weinstein, P., Boland, J., 2014. Are the dietary guidelines for meat, fat, fruit and vegetable consumption appropriate for environmental sustainability?A review of the literature. Nutrients 6 (6), 2251–2265. https://doi.org/10.3390/nu6062251.
Richter, I., Thøgersen, J., Klöckner, C., 2018. A social norms intervention going wrong: boomerang effects from descriptive norms information. Sustainability 10 (8). https://doi.org/10.3390/su10082848.
Robinson, R., Smith, C., Murray, H., Ennis, J., 2002. Promotion of sustainably produced foods: customer response in Minnesota grocery stores. Am. J. Altern. Agric. 17 (2), 96–104. https://doi.org/10.1079/AJAA200214.
Rousseau, S., 2015. The role of organic and fair trade labels when choosing chocolate. Food Qual. Prefer. 44, 92–100. https://doi.org/10.1016/j.foodqual.2015.04.002.
Salmivaara, L., Lankoski, L., 2019. Promoting sustainable consumer behaviour through the activation of injunctive social norms: a field experiment in 19 workplace restaurants. Organ. Environ. 34 (3), 361–386. https://doi.org/10.1177/1086026619831651.
Samant, S.S., Seo, H.-S., 2016a. Effects of label understanding level on consumers' visual attention toward sustainability and process-related label claims found on chicken meat products. Food Qual. Prefer. 50, 48–56. https://doi.org/10.1016/j.foodqual.2016.01.002.
Samant, S.S., Seo, H.-S., 2016b. Quality perception and acceptability of chicken breast meat labeled with sustainability claims vary as a function of consumers' label-understanding level. Food Qual. Prefer. 49, 151–160. https://doi.org/10.1016/j.foodqual.2015.12.004.
Samant, S.S., Crandall, P.G., Seo, H.-S., 2016. The effect of varying educational intervention on consumers' understanding and attitude toward sustainability and process-related labels found on chicken meat products. Food Qual. Prefer. 48, 146–155. https://doi.org/10.1016/j.foodqual.2015.09.005.
Scheibehenne, B., Miesler, L., Todd, P.M., 2007. Fast and frugal food choices: uncovering individual decision heuristics. Appetite 49 (3), 578–589. https://doi.org/10.1016/j.appet.2007.03.224.
Schmidt, K., 2020. Behavioral effects of guideline-provision on climate-friendly food choices – a psychological perspective. J. Clean. Prod. 277. https://doi.org/10.1016/j.jclepro.2020.123284.
Schmit, T.M., Rickard, B.J., Taber, J., 2013. Consumer valuation of environmentally friendly production practices in wines, considering asymmetric information and sensory effects. J. Agric. Econ. 64 (2), 483–504. https://doi.org/10.1111/1477-9552.12001.
Schnettler, B., Pardo, S., Miranda, H., Lobos, G., Mora, M., Adasme, C., 2015. Attributes That Define Preferences for Cheese in Southern Chile: Do Consumers Value Information About the Carbon Footprint? Revista Cientifica de la Facultad de Ciencias Veterinarias de la Universidad del Zulia
Schulte, E.M., Avena, N.M., Gearhardt, A.N., 2015. Which foods may be addictive? The roles of processing, fat content, and glycemic load. PLoS One 10 (2), e0117959. https://doi.org/10.1371/journal.pone.0117959.
Shao, J., 2019. Sustainable consumption in China: new trends and research interests. Bus. Strateg. Environ. 28 (8), 1507–1517. https://doi.org/10.1002/bse.2327.
Shewmake, S., Okrent, A., Thabrew, L., Vandenbergh, M., 2015. Predicting consumer demand responses to carbon labels. Ecol. Econ. 119, 168–180. https://doi.org/10.1016/j.ecolecon.2015.08.007.
Silva, A.R.D.A., Bioto, A.S., Efraim, P., Queiroz, G.D.C., 2017. Impact of sustainability labeling in the perception of sensory quality and purchase intention of chocolate consumers. Journal of Cleaner Production 141, 11–21. https://doi.org/10.1016/j.jclepro.2016.09.024.
Silva, E., Klink, J., McKinney, E., Price, J., Deming, P., Rivedal, H., Colquhoun, J., 2019. Attitudes of dining customers towards sustainability-related food values at a public university campus. Renewable Agric. Food Syst. 35 (3), 221–226. https://doi.org/10.1017/s1742170519000036.
Simeone, M., Scarpato, D., 2020. Sustainable consumption: how does social media affect food choices? J. Clean. Prod. 277. https://doi.org/10.1016/j.jclepro.2020.124036.
Sirieix, L., Delanchy, M., Remaud, H., Zepeda, L., Gurviez, P., 2013. Consumers' perceptions of individual and combined sustainable food labels: a UK pilot investigation. Int. J. Consum. Stud. 37 (2), 143–151. https://doi.org/10.1111/j.1470-6431.2012.01109.x.
Slapø, H.B., Karevold, K.I., 2019. Simple eco-labels to nudge customers toward the Most environmentally friendly warm dishes: an empirical study in a cafeteria setting. Front. Sustain. Food Syst. 3. https://doi.org/10.3389/fsufs.2019.00040.
Sogari, G., Corbo, C., Macconi, M., Menozzi, D., Mora, C., 2015. Consumer attitude towards sustainable-labelled wine: an exploratory approach. Int. J. Wine Bus. Res. 27 (4), 312–328. https://doi.org/10.1108/ijwbr-12-2014-0053.
Spaargaren, G., van Koppen, C.S.A.K., Janssen, A.M., Hendriksen, A., Kolfschoten, C.J., 2013. Consumer responses to the carbon labelling of food: a real life experiment in a canteen practice. Sociologia Ruralis https://doi.org/10.1111/soru.12009 n/a-n/a.
Spendrup, S., Hunter, E., Isgren, E., 2016. Exploring the relationship between nature sounds, connectedness to nature, mood and willingness to buy sustainable food: a retail field experiment. Appetite 100, 133–141. https://doi.org/10.1016/j.appet.2016.02.007.
Spiller, A., Zühlsdorf, A., Nitzko, S., 2017. Instrumente der Ernährungspolitik. Ein Forschungsüberblick - Teil 1. Ernährungs Umschau. 3. https://doi.org/10.4455/eu.2017.012.
Steenhuis, I.H., Waterlander, W.E., de Mul, A., 2011. Consumer food choices: the role of price and pricing strategies. Public Health Nutr. 14 (12), 2220–2226. https://doi.org/10.1017/S1368980011001637.
Taillie, L.S., Chauvenet, C., Grummon, A.H., Hall, M.G., Waterlander, W., Prestemon, C.E., Jaacks, L.M., 2021. Testing front-of-package warnings to discourage red meat consumption: a randomized experiment with US meat consumers. Int. J. Behav. Nutr. Phys. Act. 18 (1), 114. https://doi.org/10.1186/s12966-021-01178-9.
Tait, P., Saunders, C., Guenther, M., Rutherford, P., 2016a. Emerging versus developed economy consumer willingness to pay for environmentally sustainable food production: a choice experiment approach comparing Indian, Chinese and United Kingdom lamb consumers. J. Clean. Prod. 124, 65–72. https://doi.org/10.1016/j.jclepro.2016.02.088.
Tait, P., Saunders, C., Guenther, M., Rutherford, P., Miller, S., 2016b. Exploring the impacts of food label format on consumer willingness to pay for environmental sustainability: a choice experiment approach in the United Kingdom and Japan. Int. Food Res. J. 23 (4).
Tansakul, N., Suanmali, S., Shirahada, K., 2018. The impact of product labels on green preferences and perceptions of customers: an empirical study of milk products in Japan. Int. J. Sustain. Soc. 10 (2).
Thaler, R.H., Sunstein, C.R., 2008. Nudge: Improving decisions about health, wealth, and happiness. Yale University Press.
The Rockefeller Foundation, 2021. True cost of food - Measuring what matters to transform the U.S. food system. . https://www.rockefellerfoundation.org/wp-content/uploads/2021/07/True-Cost-of-Food-Full-Report-Final.pdf.
Thøgersen, J., Zhou, Y., 2012. Chinese consumers' adoption of a 'green' innovation – the case of organic food. J. Mark. Manag. 28 (3–4), 313–333. https://doi.org/10.1080/0267257x.2012.658834.
Tian, Y., Croog, R., Bovay, J., Concepcion, A., Getchis, T.L., Kelly, M.R., 2021. Who responds to health, environmental, and economic information about local food? Evidence from Connecticut seafood consumers. Aquac. Econ. Manag. 26 (2), 1–21. https://doi.org/10.1080/13657305.2021.1945166.
Tilman, D., Clark, M., 2014. Global diets link environmental sustainability and human health. Nature 515 (7528), 518–522. https://doi.org/10.1038/nature13959.
Tjärnemo, H., Södahl, L., 2015. Swedish food retailers promoting climate smarter food choices—trapped between visions and reality? J. Retail. Consum. Serv. 24, 130–139. https://doi.org/10.1016/j.jretconser.2014.12.007.
Tobler, C., Visschers, V.H.M., Siegrist, M., 2012. Addressing climate change: determinants of consumers' willingness to act and to support policy measures. J. Environ. Psychol. 32 (3), 197–207. https://doi.org/10.1016/j.jenvp.2012.02.001.
Trevena, H., Kaldor, J.C., Downs, S.M., 2015. 'Sustainability does not quite get the attention it deserves': synergies and tensions in the sustainability frames of Australian food policy actors. Public Health Nutr. 18 (13), 2323–2332. https://doi.org/10.1017/S136898001400295X.
Valor, C., Carrero, I., Redondo, R., 2013. The influence of knowledge and motivation on sustainable label use. J. Agric. Environ. Ethics 27 (4), 591–607. https://doi.org/10.1007/s10806-013-9478-3.
van Giesen, R., Leenheer, J., 2019. Towards more interactive and sustainable food retailing. Int. J. Retail Distrib. Manag. 47 (1), 55–75. https://doi.org/10.1108/ijrdm-11-2017-0280.
Van Loo, E.J., Caputo, V., Nayga, R.M., Verbeke, W., 2014. Consumers' valuation of sustainability labels on meat. Food Policy 49, 137–150. https://doi.org/10.1016/j.foodpol.2014.07.002.
Van Loo, E.J., Caputo, V., Nayga, R.M., Seo, H.-S., Zhang, B., Verbeke, W., 2015. Sustainability labels on coffee: consumer preferences, willingness-to-pay and visual attention to attributes. Ecol. Econ. 118, 215–225. https://doi.org/10.1016/j.ecolecon.2015.07.011.
Vecchio, R., 2013. Determinants of willingness-to-pay for sustainable wine: evidence from experimental auctions. Wine Econ. Policy 2 (2), 85–92. https://doi.org/10.1016/j.wep.2013.11.002.
Vecchio, R., Annunziata, A., 2015. Willingness-to-pay for sustainability-labelled chocolate: an experimental auction approach. J. Clean. Prod. 86, 335–342. https://doi.org/10.1016/j.jclepro.2014.08.006.
Vecchio, R., Annunziata, A., Krystallis, A., Pomarici, E., 2015. Consumers' literacy and preference for sustainability labels: an exploratory analysis on Italian young adults. Int. J. Glob. Small Bus. 7.
Vermeir, I., Verbeke, W., 2008. Sustainable food consumption among young adults in Belgium: theory of planned behaviour and the role of confidence and values. Ecol. Econ. 64 (3), 542–553. https://doi.org/10.1016/j.ecolecon.2007.03.007.
Vlaeminck, P., Jiang, T., Vranken, L., 2014. Food labeling and eco-friendly consumption: experimental evidence from a Belgian supermarket. Ecol. Econ. 108, 180–190. https://doi.org/10.1016/j.ecolecon.2014.10.019.
von Ow, A., Waldvogel, T., Nemecek, T., 2020. Environmental optimization of the Swiss population's diet using domestic production resources. J. Clean. Prod. 248. https://doi.org/10.1016/j.jclepro.2019.119241.
Wahlen, S., Heiskanen, E., Aalto, K., 2011. Endorsing sustainable food consumption: prospects from public catering. J. Consum. Policy 35 (1), 7–21. https://doi.org/10.1007/s10603-011-9183-4.

Weber, A., 2021. Mobile apps as a sustainable shopping guide: the effect of eco-score rankings on sustainable food choice. Appetite 167, 105616. https://doi.org/10.1016/j.appet.2021.105616.
Wolff, F., Schönherr, N., Heyen, D.A., 2016. Effects and success factors of sustainable consumption policy instruments: a comparative assessment across Europe. J. Environ. Policy Plan. 19 (4), 457–472. https://doi.org/10.1080/1523908x.2016.1254035.
Xu, Y., Jeong, E., 2019. The effect of message framings and green practices on customers' attitudes and behavior intentions toward green restaurants. Int. J. Contemp. Hosp. Manag. 31 (6), 2270–2296. https://doi.org/10.1108/ijchm-05-2018-0386.
Xuan, B.B., 2021. Consumer preference for eco-labelled aquaculture products in Vietnam. Aquaculture 532. https://doi.org/10.1016/j.aquaculture.2020.736111.
Yang, X., Chen, Q., Xu, Z., Zheng, Q., Zhao, R., Yang, H., Ruan, C., Han, F., Chen, Q., 2021. Consumers' preferences for health-related and low-carbon attributes of rice: a choice experiment. J. Clean. Prod. 295. https://doi.org/10.1016/j.jclepro.2021.126443.
Yeğenoğlu, S., Aslan, D., Şahne, B.S., Büken, N.Ö., 2021. Innovative approaches to healthy nutrition and sustainable food matters by concerned parties: insights from the INPROFOOD project (case study: Turkey) Turkey's outputs from INPROFOOD. Health Policy Technol. 10 (2). https://doi.org/10.1016/j.hlpt.2021.100516.
Zaharia, A., Diaconeasa, M.C., Maehle, N., Szolnoki, G., Capitello, R., 2021. Developing sustainable food Systems in Europe: National Policies and stakeholder perspectives in a four-country analysis. Int. J. Environ. Res. Public Health 18 (14). https://doi.org/10.3390/ijerph18147701.
Zepeda, L., Sirieix, L., Pizarro, A., Corderre, F., Rodier, F., 2013. A conceptual framework for analyzing consumers' food label preferences: an exploratory study of sustainability labels in France, Quebec, Spain and the US. Int. J. Consum. Stud. 37 (6), 605–616. https://doi.org/10.1111/ijcs.12041.
Zhao, R., Yang, M., Liu, J., Yang, L., Bao, Z., Ren, X., 2020. University Students' purchase intention and willingness to pay for carbon-labeled food products: a purchase decision-making experiment. Int. J. Environ. Res. Public Health 17 (19). https://doi.org/10.3390/ijerph17197026.
Zhou, J., Liu, Q., Mao, R., Yu, X., 2017. Habit spillovers or induced awareness: willingness to pay for eco-labels of rice in China. Food Policy 71, 62–73. https://doi.org/10.1016/j.foodpol.2017.07.006.