



Climate labels and the restaurant industry: a qualitative study

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Abstract

As the food industry accounts for more than one-third of global anthropogenic greenhouse gas emissions, it is one of the largest contributors to climate change. Strategies for reducing CO₂e (equivalent) emissions must be implemented to regulate the impact the food systems have on the climate. Environmental communication using climate labels and sharing information on carbon footprints can help reduce GHGs emissions from restaurant purchases on a systemic scale. The aim is to gain insights and study how a carbon label influences the concept of a climate-friendly restaurant and its capacity to bridge the gap between knowledge, awareness, and action. What are the motivations for restaurant employees to adopt climate-friendly behavior? How does the label's use influence restaurants' decision to track their carbon footprint over time, communicate the carbon footprint of dishes, and adapt menus to be more climate-friendly? The data were collected with semi-structured interviews with video communication with three restaurant chains, all using labels. The data collected via the interviews were examined using an inductive thematic analysis to identify key themes. The transcending transmission approach to communication was used to gain insights into instrumental and constitutive communication dynamics. As the theoretical framework, 'symbolic interactionism' helps untangle constitutive aspects of environmental communication surrounding climate labels to analyze the process of conceptualization through usage, co-creation, and interpretation. The analysis brought forward three main themes: the interactions between the scientific data accessible in the tool and the restaurants. Second, the diverse implications of sustainability marketing for motivating climate actions and what they look like. And finally, climate actions and how they are being apprehended and implemented by the restaurants. The promise of climate labels was discussed by elaborating on socio-cultural dynamics, sustainability marketing, and activism forces and impulses influencing the motivations for restaurants. We then discussed the capacity to transcend information into action through collaboration and inclusiveness to avoid greenwashing. Restaurants have a commercial interest in implementing climate labels in their business and an intrinsic desire to be a company that takes action for the planet because of the restaurants 'employees' convictions. However, restaurants find themselves in a tricky situation where they can be criticized if they take 'wrong' actions that can be considered greenwashing and criticized if they do nothing. The software enables restaurants to legitimize their actions and communicate them, making them resilient and evolving.

Keywords Carbon footprint · Climate labeling · Restaurant · Climate action · Environmental communication

1 Introduction

The global Paris Agreement 2015 commits to limiting global warming to well below 2 °C compared to pre-industrial levels (UNFCCC 2016). Collective efforts are needed to

reach these ambitious goals to change the status quo and combat climate change. As the food industry accounts for more than one-third of global anthropogenic greenhouse gas emissions, it is one of the most significant contributors to climate change (FAO 2021). The EU has devised a Farm to Fork strategy to address this issue, introducing a labeling scheme to harmonize voluntary food labels. This is meant to ensure that the climate impact of food is addressed and communicated within the food industry and to consumers (EU 2020). Environmental labels provide factual information about a product or a service in terms of its impact, for instance, the carbon footprint, water footprint, recyclability,

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or provenance (ISO 14040 2006; IPCC 2022; Tan et al. 2014). Climate labels contain information about the amount of Greenhouse Gases (GHGs) emitted during production, processing, packaging, and transport (ISO 14040 2006). The efforts for a climate labeling scheme align with indications that labels could redefine the climate impact of the food industry (Babakhani et al. 2020; Kostova 2019; Pulkkinen et al. 2016).

The labeling system is meant to enable restaurants and caterers to make more informed decisions to implement climate solutions to lower the environmental impact of their activities (Sherry and Tivona 2022; Kaljonen et al. 2020). This can start by publicly reporting GHG emissions to understand the overall climate impact better, set climate goals, and identify the GHG emissions hotspots to start reducing (Sherry and Tivona 2022). Scope 3 emissions, encompassing emissions not produced by the company itself but as an indirect result of their activity up or down the value chain, are the GHG emissions that tend to have the most prominent climate burden for hospitality businesses, as they include all indirect emissions that occur throughout a company's value chain, both upstream and downstream (Sherry and Tivona 2022; Huang et al. 2009). For example, the Scope 3 GHG emissions in food service are commonly associated with (a) the agricultural activities necessary to produce the raw materials, (b) the emissions from cooking the food, and (c) the transport associated with the journey between the farm and the fork. When those emissions are communicated with a commonly recognized and coherent labeling system, such communication helps connect the great diversity of actors within the food service industry (Sherry and Tivona 2022; Kostova 2019).

The environmental impact of food is currently primarily estimated and calculated using the life cycle assessment (LCA) methodology (Röös et al. 2014). Studies from Sherry and Tivona (2022) and Röös et al. (2014) examined how the LCA of the food served in restaurants can inform the purchasing decisions, definition, or creation of menus. The authors highlighted that for the global warming potential to be visualized and addressed, a necessary first step is to use Carbon Footprint (CF) data to help build awareness and as a decision support tool.

The reasons behind the decision for food corporations to share the CF of their activity through labels are wide ranging. From the necessity to be proactive and future-proof businesses by adopting new net zero strategies to reach the goals set in the 2030 agenda before it becomes mandatory, the willingness to set up a “green” marketing strategy to attract consumers, to educate the consumers, or for activism (Dupuis and Schweizer 2019; Galli et al. 2018; Tan et al. 2014). Sustainability marketing promotes sustainable products and services, encourages sustainable behavior, and fosters critical reflection (Kemper and Ballantine 2019).

However, it is essential to note that although environment labels are helping to define ‘climate-friendliness’ for consumers and to better business practices, they are also abused and have been known to lead to deception (Dupuis and Schweizer 2019; Horne 2009). The labels can be diverted into “greenwashing” or painting environmental “green” actions as more virtuous than they are (Sharma and Kushwaha 2019; Torelli et al. 2020). But generally, using environmental labels is a strategy and practice implemented to adapt, promote values, be coherent with today's climate challenges, and be active or proactive to help shape and contribute to defining climate-friendliness (Delmas et al. 2019).

Science-based facts about the climate are becoming cemented as common knowledge, and the recognition of the need to address climate change has grown in society. However, actual actions to tackle those commonly recognized issues are often lacking, creating a dichotomy between awareness and action commonly referred to as the awareness–action gap or the attitude–behavior gap (Ágústsdóttir 2021; Zralek 2017; Terlau and Hirsch 2015). Studies from Sherry and Tivona (2022), Babakhani et al. (2020), and Pulkkinen et al. (2016) explored the reactions of consumers when faced with carbon labels (calculated with LCAs) on menus in restaurants. This highlighted that customers tend to react positively to the labels but that this initial short-term reaction needs to be supported by longer-term campaigns to see carbon labeling drive future decision-making (Sherry and Tivona 2022; Babakhani et al. 2020; Darkow et al. 2015). Studies from Camilleri et al. (2019) and Zander and Feucht (2018) examined consumers' carbon label preferences. They concluded that consumers lack the knowledge, awareness, and tools to make the best possible climate-friendly decisions regarding their behavior and consumption. The lack of labels and environmental information effectively hinders the capacity to make informed decisions and take action.

Awareness of the connection between food choices and climate impact needs to be improved, making it necessary for climate labels to inform consumers (Hartmann and Siegrist 2017; Leach et al. 2016; Peschel et al. 2016). Restaurants have a unique capacity to create connections between stakeholders and foster productive communication (Pulkkinen et al. 2016).

This study aims to gain insights and study how a carbon label influences the concept of a climate-friendly restaurant and its capacity to bridge the gap between knowledge, awareness, and action. For this reason, the following research questions have been identified: What are the motivations for restaurant employees to adopt pro-environment behavior with the label? What potential do labels have to promote environmental awareness and action?

2 Theory

2.1 Transcending transmission

Environmental communication has a dual nature, both as being a platform to constitute meaning collectively to make sense of how we perceive climate-friendly behavior in restaurants, but also as a tool to foster curiosity and discussion and enable behavioral change, an approach described by Schoeneborn and Trittin (2013) as transcending transmission communication.

The transcending transmission approach is a valuable communication theory when observing corporate communication, public relations, or marketing (Heide et al. 2018; Schoeneborn and Trittin 2013). Ideally, this corporate communication process cannot and should not be driven only by voluntary “bottom-up” or mandatory “top-down” pressures to lead to longer-lasting, stabilized, and consolidated forms of organization and actions (Schoeneborn and Trittin 2013, p. 199). This method serves the restaurant industry specifically as intentions to take climate actions are done in a corporate setting requiring organized branding and strategic development for the company’s and its employees’ well-being. If consumers feel bad when purchasing food or fail to see the ramifications of their actions, they are less likely to change their habits (Horne 2009). As further emphasized by Cox (2010), if information and knowledge are shared and built encouragingly and constitutively without passing judgment on the consumer or business for making certain decisions, it is more likely to lead to positive emotions. Therefore, this framing of the climate action narrative is built on competing rationalities that try to reconcile the desire to do good for the planet and maintain a profitable business. These concerns can appear conflicting or even threatening the motivations of using labels as an environmental communication tool. However, when using the transcending transmission approach, conflicts can be embraced as an enabler and a platform to start collective interactions (Schoeneborn and Trittin 2013). Those interactions should account for all those complex and conflicting motivations and pressures influencing how climate action based on interaction with labels is embraced, such as profitability, monetary, ethical, regulatory, or governmental pressures. It highlights how every action contributes to social construction (Pezzulo and Cox 2018).

Compared to other communication strategies, such as transmission communication, transcending transmission communication emphasizes understanding and empathy for the audience, using clear and concise language, and incorporating nonverbal cues and tone to enhance the message. It also focuses on building relationships and establishing trust, rather than just delivering information.

2.2 Interpretative analysis

Symbolic interactionism theory can help untangle those constitutive aspects of environmental communication surrounding climate labels through their use, co-creation, and interpretation (Blumer 1969). The visual representation and communication of environmental data using labels and what their use means for humans, and the planet, only makes sense when the parties are co-creating such meaning from interactions between the restaurants and the consumers through interpretations, ideas, and emotions (Hansen and Machin 2013). The interactions are assisted and enabled by environmental communication and climate labels to help provide a common language to build interactions that feed the debate and drive actions to adapt what is cooked, how, and why to fight the climate crisis (Hansen and Machin 2013). The labels mean nothing if they are not collectively recognized, understood, and used as an indicator or symbol for climate-friendly food.

Activities among individuals seeing the labels, discussing them, companies using the food labels, sharing information about it, and using them to communicate their climate actions are all part of communicating with the labels and shaping their meaning and application (Carter et al. 2015). Those interactions occur in a specific social and cultural context. Symbolic interactionism theory requires a deep grounding in socio-cultural communication theory to understand the diversity and depth of the driving forces in time and place (Craig 1999). These socio-cultural forces can be intrinsic, from the individual, such as values or emotions, or extrinsic, from outside the individual as external conditions, such as regulations or a given political context (Silvi and Padilla 2021). As a result, those socio-cultural forces impact the communication processes, influencing the attitude–behavior gap (Ágústsdóttir 2021; Nicholls and Drewnowski 2021; Silvi and Padilla 2021; Knox 2000).

3 Methods

3.1 Labeling

The calculations are done in a web tool that enables restaurant employees to calculate the climate impact of the food served by feeding information about the ingredients, production method, and country of origin. The data are retrieved from country-specific databases with carbon footprint data using ISO14040-certified method for calculating LCA CO₂e emissions. To communicate and contextualize what the CF means, the carbon footprint classifies dishes (items on the menu) between three categories: Low (0.1–0.55 kg CO₂e), Medium (0.55–1.55 kg CO₂e), and High (1.55 + kg CO₂e). The labels have one decimal and three icons (Fig. 1).

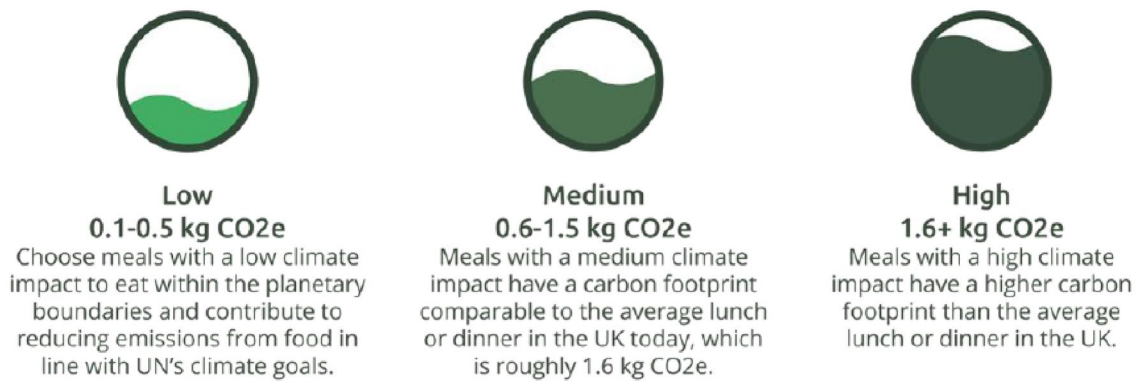


Fig. 1 Labeling classes

To reach the UN's sustainability goals, WWF One Planet Plate estimates that each individual's food-related climate impact should not exceed 0.5-kg CO₂e per kg of food (WWF 2023). As of 2022, an average lunch or dinner in Northern Europe has a carbon footprint of 1.7-kg CO₂e (WWF 2023).

3.2 Interviews

We made semi-structured interviews via video communication and online data gathering (Gray et al. 2020) with representatives of three restaurant chains all using the labels in their business. The interviewees were selected according to their level of interaction with the labeling company, the labels, and the restaurants that work with the climate labels. Three different restaurants were selected according to the fact that they have similar size and are all small restaurant chains: ASIA in Norway (Executive Chef interviewed), LETT in Norway, Sweden, and Denmark (Head of Operation), and VACA in Denmark (Marketing Assistant interviewed).

3.3 Analysis

As the data collected via the interviews are qualitative, we examined them using an inductive thematic data-driven analysis (Nowell et al. 2017; Burnard et al. 2008). In the first stage, all the raw interviews are organized as one body of data for familiarity and initial feature extraction (Nowell et al. 2017, p. 5). In the second phase, initial codes are generated to simplify and focus on specific characteristics (Nowell et al. 2017). In the third phase, codes related to similar concerns and ideas are condensed into central recurring subthemes (or categories) (Nowell et al. 2017). These subthemes are finally grouped into the essential relevant topics of the study.

4 Results

The inductive thematic analysis helped identify patterns of three main recurring themes arising from the interviews and observations:

- The interactions between the scientific data and the restaurants.
- The diverse implications of sustainability marketing for motivating climate action
- Climate actions and how restaurants are implementing them.

4.1 Scientific data interactions

The tool was designed for restaurant employees, chefs, and other food service providers to generate the CF of their food by entering a few pieces of information about their ingredients: quantity, number of servings, country of origin, and production method. All participants recognized the user-friendliness of the application as they discussed its accessibility and that one does not require previous knowledge to be able to calculate CF. One person shared their own experience of using the app to calculate the CF of recipes as follows:

I think it has improved a lot over the years. And it's becoming more and more user-friendly. I think it's a very easy tool to use. And it goes super-fast to put in recipes once you understand also quite, what are the most important ingredients that you fill into the app.

Another establishment mentioned that although they may change suppliers, their menus and recipes are not changing that much, meaning that their experience of the tool will be lesser compared to restaurants with seasonal menus and other environmental goals in place that push them to reassess their resource management more often. However, when

asked what her own experience with the app was, she voiced that it left a significant impression on her:

Yeah, I did use the tool. I did, in the beginning, for example, try to swap out falafels with our tempura shrimps, and it was like, mind-blowing to see what a difference it makes. And that's also like, just by doing small tricks, you can actually reduce the impact on the environment a lot. I think that's amazing.

According to the interviews, although there are some limitations to the interactions of individuals with the scientific data, the capacity of the label to connect individuals to climate information without requiring previous knowledge brings people closer to the issue of climate change and excited about possible actions to take.

It was brought up that the label is not a traffic light system with red, orange, and green that tells people what is “good” or not. It is a more neutral communication system in that it only presents the traffic light colors informing about the CF of dishes; it does so in a manner that encourages reflection and flexibility to choose dishes higher or lower depending on what you choose to eat within a recommended carbon budget without outright telling consumers what to do or think (cf. Fig. 1). Some restaurants shared that they have internal reflections and discussions based on their calculation and how to make concrete changes to their menus to reduce their CF, and external talks with their clients to see how they respond to the labels. Most participants emphasized that having open, trusting, and reliable communication is necessary for long-lasting, meaningful, and collaborative use and implementation of the labels. The participants considered this open process as a gateway to getting more and more people curious about how to reduce their emissions. The restaurants pointed out that it is not easy but crucial to have restaurant management engaged, thinking, and included in the climate conversation.

The Operational and Sustainability Manager (OSM) and the Executive Chef (EC) shared their experience of approaching environmental communication not through preaching but with efforts and actions to make people more environmentally aware of the restaurant and its management. In their own words about using the labels:

I really like how it is now. Not so much pointing fingers, but reaching out with kind of “here is the information available.” Of course, nudging is also something that affects people a lot. But, I think good and reliable information that is available for most people, that's kind of the way I hope the communication can be.

Most interviewees mentioned asking questions about the scientific data, regulations, best behaviors, and the climate in general, interrogations that help develop environmental

knowledge and awareness. This dynamic was recognized repeatedly during the interviews as helping inform decisions and the behavior of all actors. Here, the role of communication is perceived by the interviewees as not only a means for informing decisions but an opportunity to co-create and recreate the ‘rules’ of communication, which are based on trust, not passing judgment, and learning together how to raise awareness best to help reduce GHG emissions.

The importance of communication around the labels was repeatedly emphasized and encouraged. This was highlighted as internal dialogue within restaurant management and external to share their efforts and work with their clients to make their business more climate-friendly. All three restaurants provide information about the labels and create platforms to discuss their commitments with their employees and customers. However, this is done at different levels (Figs. 2, 3, 4).

The need to have an assigned “champion” stood out as perhaps being the most influential in having fruitful and constructive exchanges of ideas or visions. Suppose no one is passionate about taking climate action and sees the potential in implementing transparency and CF reductions. In that case, it is much more difficult for the labels to build climate awareness and actions. It is not easy to get consumers interested and excited about and keep restaurants’ management



Fig. 2 LETT communicates the CF value in numbers and ‘symbols’

Fig. 3 ASIA communicates the CF value in numbers without using labels

HOT DISHES

SUMMER UDON SOUP C,H,SO,V [0,3]	235
<i>Valnøttmiso, konge ostersopp, udon-nudler / Walnut miso, king oyster mushroom, udon noodles</i>	
ASIA MUSSELS BL,F,SK,SO [0,3]	235
<i>Blåskjell, koriander, skalldyr- & kokosmelk-kraft / Mussels, coriander, shellfish and coconut stock</i>	
SWEET & SOUR ORGANIC CHICKEN STIR FRY E,H,PSO [0,7]	265
<i>Wokkede grønnsaker, eggnudler, søt soya, koriander / Stir fry vegetables, egg noodles, sweet soy, coriander</i>	
KHAO SOI ORGANIC CHICKEN NOODLE CURRY E,H,S,SK,SO [0,7]	265
<i>Kylling, ristet chili og hvitløk, koriander / Chicken, roasted chilli and garlic, coriander</i>	
ROASTED DUCK BREAST C,SO [0,4]	295
<i>Søtpotetpure, spicy sesamkål / Sweet potato puree, spicy sesame cabbage</i>	
GLAZED SALMON C,F,SO [0,9]	238
<i>Laksefilet, nahm jim, syltet daikon / Salmon fillet, nahm jim, pickled daikon</i>	



Fig. 4 VACA communicates the CF value with labels and numbers

engaged, ensuring lasting efforts over time with, for instance, tracking and reporting the CF of food. A marketing assistant (MA) emphasized this struggle of balancing climate interest and passion with daily tasks and other responsibilities, which can limit commitments:

I think, when we just got the labels, at least me, I was very excited about it. After we got it implemented, put the labels on the menus on the website, did the social media post, then you have a lot of other partners, a lot of other stuff you're working with. It hasn't been an area of focus for me as much as I wanted it to be.

During the interviews, an increased and ongoing interest in environmental efforts emerged. For instance, restaurants talked about reducing food and packaging waste, adapting their supply chain to support local and smaller producers,

and getting more involved with labeling. Although the intentions are encouraging and having a climate champion is functional, keeping the interest takes time and effort. Many companies start with the basic package to calculate the CF of their dishes and share them with their guests. However, it requires more profound interest and environmental ambitions to start tracking the climate impact through reports.

4.2 Legitimizing decisions in restaurants

The participants specified that the tool provides visibility of the climate impact of food for restaurants but that climate change is a big, intimidating, complex, and intangible issue. The labels are used as an entry point for visualizing, raising awareness, and taking the first steps. For instance, the CF calculations were in one establishment employed as a

strict guideline of what will be on the seasonal menus. When asked about how this knowledge and contact with the data impacted her and her willingness to act, one responder said:

And it also made it possible for us because, without the label, we never could do this by ourselves. And then we learn more about it. And then we really got down to work with it and to make our menu climate-friendly. And then, of course, now we're kind of on the right track and it is easier.

However, even though employees can be excited about climate actions and learning more, being transparent and accountable, the reality of making those decisions to act for businesses is intimidating. During the interviews, the restaurants' employees voiced this concern that the economic survival of the restaurants is paramount and that making big managerial decisions beyond sharing the CF on menus can depend on convincing the owners and other stakeholders:

I mean, I look forward to the motivation (for climate action) growing and solidifying in future. But again, the caveat to that is the fact that the restaurant business is in tatters at the moment, post-COVID. So, it's very hard to find the right resources now for restaurants.

Beyond efforts to limit negative climate impact, economic, and social considerations must also be met. Restaurant management wants to ensure that changes will genuinely impact the planet while preserving taste and providing added value for consumers.

4.3 Sustainability marketing motivating climate actions

A strong motivation for restaurants to calculate and communicate the CF of their food is showing that they are "doing the right thing" by acting for the environment. The restaurants desire to build a reputation as climate-friendly and accountable businesses. An environmentally friendly image and 'walk the talk' and take concrete actions to help the environment. As the Marketing Assistant (MA) expressed the importance of climate action for their restaurant:

It is not a question of needing to work with sustainability in some way. And again, I think you really need to integrate it into your core business, not just have it as an add-on. Because for me, that just becomes kind of greenwashing. And that's definitely not what we want to do.

With the constant risk of being branded as greenwashers, interviewees were adamant that credibility is central to their branding and an ethos for running their restaurant. They shared that this credibility is built mainly through transparency, accountability, and adapting to new scientific

knowledge and regulations. The most crucial factor is the desire for the restaurants to market themselves as climate-friendly. Labeling tools help decisions ahead of future legal requirements and market changes to ensure that a business will remain resilient. Many pointed out that implementing climate solutions now is a prerequisite to survive in future. Top-down CF regulation pressures are coming, and public opinion of corporate climate efforts is becoming louder and more critical. In her own words, One MA expressed:

You can see it on the political side; you can see it from the consumer side. So for me, it's like, it's not a question that you need to work with sustainability in some way.

It was clear that taking pre-emptive measures for future regulations and aligning with global climate goals is a solid and growing concern, also to differentiate the brands and gain a competitive advantage.

5 Discussion

Regarding the first research question to identify the motivations to adopt climate-friendly behavior with labeling, the inductive thematic analysis showed that those motivations are diverse and depend on intrinsic and extrinsic forces and conditions affecting restaurants. Those influences are developed through interactions, dialogue, and socio-cultural dynamics that ground our relationship with food within greater underlying forces, from inner values and emotions to broader social norms or regulations. For the second research question concerning the power of the label on the restaurants' decision to track and communicate the carbon footprint of dishes and adapt menus to be more climate-friendly, the analysis showed that those measures depend on the capacity to turn knowledge into awareness and action. Bridging the attitude-behavior gap by influencing perceptions and managerial shifts is a complex process that depends on many factors that evolve with time, incentives, experience, and interactions.

5.1 Motivations to adopt climate-friendly behavior

The interviews showed that the motivation to adopt labels to improve restaurants' practices and become more transparent about their CF was influenced by two main factors; the intention to implement sustainability marketing and an intrinsic desire to do good. By choosing to start working with labeling and sharing the impact of the served food, restaurants are contributing and redefining their role. They can diversify their offer from simply serving food to recognizing climate change as problematic and position themselves as taking climate action.

The motivation to work with labels can be explained by socio-cultural dynamics influencing our connection to food according to our values, traditions, and emotions (Ágústsdóttir 2021; Nicholls and Drewnowski 2021; Knox 2000). The observed duality in motivation findings concurs with previous studies that found that motivations to use climate labels were both “forced” and came from an intrinsic desire to preserve the planet (Silvi and Padilla 2021; Koch 2020). How communication and interactions impact the restaurant industry can be seen as creating new norms and shaping society (Carter et al. 2015). Similarly, the motivations highlighted in previous studies ranged from the necessity to be proactive and future-proof businesses before it becomes mandatory to the willingness to manage reputations, attract and retain consumers, and educate them (Koch 2020; Dupuis and Schweizer 2019; Galli et al. 2018; Tan et al. 2014). Behavioral and lifestyle changes are indispensable to reaching the Paris Agreement (IPCC 2022). Although activist brands help shape climate action, facade efforts with no intrinsic motivations behind them do not lead to the same results as passionate and excited efforts (Cox 2010).

5.2 From communication to action

The exposure to labels does not necessarily lead to climate awareness and action within the restaurants, but it helps bridge the attitude–behavior gap. The tool’s user-friendliness assists restaurant employees in connecting with the impact of food. Abusing climate-friendliness claims come at great costs for companies (Dupuis and Schweizer 2019; Horne 2009).

Gaining first-hand experience with the label helps participants recognize that small changes do not have to be intimidating or scary and can positively impact the planet. Camilleri et al. (2019) and Zander and Feucht (2018) elaborated that consumers need more knowledge, awareness, and tools to make the best possible climate-friendly decisions, lowering their confidence to act. Given the correct information and tools, restaurants do take actions to “boost consumer decision-making by providing relevant skills, knowledge, and decision tools” (Camilleri et al. 2019, p. 53). Additionally, the findings of Hartmann and Siegrist (2017), Leach et al. (2016), and Peschel et al. (2016) about the boundaries between customers’ awareness and action in the food industry coincided with our observations at the restaurant level. Although restaurants have a significant potential for CF reduction and are a meaningful platform for climate action, they often need more tools to inform and justify their managerial decisions and turn good intentions for the environment into fully formed, lasting, and effective climate actions. Most interviewees recognized the challenge of taking an initial interest in climate actions and turning them into more extensive systemic changes. However, they highlighted the power

of having a climate champion, genuine interest, and intrinsic desire to do good as great starting points. The climate champion has a significant scientific and emotional impact on restaurant conversations. Ágústsdóttir (2021) sees this connection as helping make climate awareness and action part of a new socio-cultural norm as it becomes part of corporate identity. Interactions and communication between the different actors in the restaurant industry help co-create the meaning of climate action and emotionally connect the scientific knowledge to the actors’ climate awareness, defining what it means to take climate actions in a specific socio-cultural context.

The gap between knowledge and action was also combated in the restaurants with the development of broader conversations around the labels through creating platforms for employees and customers to come face to face with the climate data in some form. This has taken the shape of having the labels visible on the menus, having environmental training for the employees, sharing articles about their work in employee magazines, etc. The need to have communication around the labels and how this is done impacts the capacity to reduce emissions and the depth to which climate decisions can turn into systemic changes at the restaurant level. The results of this study confirm that the global demand for more knowledge, information, debates, and actions to address the climate crisis requires systemic and harmonized communication from corporations (Godemann 2021).

Regarding the use and abuse of climate labels, our findings showed that restaurants generally desire to do good and show it. This tends to limit the risk of being deceptive Dupuis and Schweizer (2019) and Horne (2009) defined it as claiming that “green” actions are better for the environment than they are. This duality of motivation mentioned earlier provides strong grounds to design credible actions that evolve and adapt with time. In the context of this study, greenwashing was recognized by participants as both an issue to avoid at all costs due to both their desire to help the planet and to ensure that the restaurant does not get a bad reputation that would hurt it (Torelli et al. 2020). In this context, the risk of greenwashing can be perceived as a motivation causing a reaction or response for restaurants to start taking action (Torelli et al. 2020). If the intention is to run their restaurants with excellent and transparent environmental performances, greenwashing is less likely (Delmas et al. 2019).

5.3 Future research

There are multiple paths for future endeavors testing new approaches toward lowering the impact and emissions from the restaurant sector. While labeling, as discussed in this article, is a potent means, a review found that

changing the order of the menu (placing low-emission dishes at the top) is the most effective action for promoting consumer action (Winterstein 2022). Future research could investigate the effects of not only changing the order but changing the prices on the menu, as Ingelbeek (2015) showed that penalizing choices that are unhealthy for the environment through price adjustments could affect consumer behavior. Additionally, adjusting the pictures on the menu, the size of the texts, or even the titles of the dishes are other known strategies to draw attention to the featured dishes (Reinholdsson et al. 2023). This may draw more consumers to purchase the featured items, and studies could be done to determine the best juxtaposition of these features to encourage more environmentally friendly orders. Overall, understanding the ways that people perceive this information, aided by the help of psychologists and sociologists, may be a practical course of action (Well 2014). This study may have exposed what works, but more research must be done to discover why and how (Wells 2014).

Further, benefits may be found from studies that focus on the type of people that are most and least prone to accepting the suggestions of these adjustments. Understanding the psychology of individuals based on demographic features may help strategize through marketing techniques in menus, restaurant advertisements, loyalty programs, and more. Restaurants can use this to their advantage to help the environment and utilize resources effectively to capture the attention of the target consumer market (Maxwell et al. 1997).

6 Conclusion

In summary, the paper found that restaurants are interested in implementing carbon labels in their business for the survival of their companies now and in future, as well as an intrinsic desire to be a company acting for the planet because of convictions. However, restaurants find themselves in a tricky situation where they can be condemned if they take action that is considered improper or greenwashing and condemned if they do nothing. An independent label gains value as a tool that enables restaurants to legitimize their positive climate actions in a resilient and evolving way.

Solutions to address the climate impact of the restaurant industry have to be multiple and reflect the complexity and diversity of the actors who shape it. They can ensure that climate actions are most adequate and effective in place, essentially defining a climate-friendly restaurant.

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Declarations

Conflict of interest The authors declare that they have no conflict of interest.

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References

- Ágústsddóttir Á (2021) Environmental food labeling for behavior change in the UK: a critique and mapping of discourses. Aalto University. <https://aaltodoc.aalto.fi:443/handle/123456789/111895>. Accessed 28 April 2022
- Babakhani N, Lee A, Dolnicar S (2020) Carbon labels on restaurant menus: do people pay attention to them? *J Sustain Tour* 28(1):51–68. <https://doi.org/10.1080/09669582.2019.1670187>
- Blumer H (1969) Symbolic Interactionism. Perspective and method. University of California Press, Berkeley
- Burnard P, Gill P, Stewart K, Treasure E, Chadwick B (2008) Analysing and presenting qualitative data. *Br Dent J* 204(8):429–432
- Camilleri A, Larrick RP, Hossain S, Patino-Echeverri D (2019) Consumers underestimate the emissions associated with food but are aided by labels. *Nat Clim Change* 9(1):53–58. <https://doi.org/10.1038/s41558-018-0354-z>
- Carter M, Galli J, Fuller C (2015) Symbolic interactionism. *Sociope-dia.isa* 1:1–17
- Cox JR (2010) Beyond frames: recovering the strategic in climate communication. *Environ Commun* 4(1):122–133. <https://doi.org/10.1080/17524030903516555>
- Craig RT (1999) Communication theory as a field. *Commun Theory* 9(2):119–161. <https://doi.org/10.1111/j.1468-2885.1999.tb00355.x>
- Darkow I-L, Foerster B, von der Gracht HA (2015) Sustainability in food service supply chains: future expectations from European industry experts toward the environmental perspective. *Supply Chain Manag* 20(2):163–178. <https://doi.org/10.1108/SCM-03-2014-0087>
- Delmas MA, Lyon TP, Maxwell JW (2019) Understanding the role of the corporation in sustainability transitions. *Organ Environ* 32(2):87–97. <https://doi.org/10.1177/1086026619848255>
- Dupuis J, Schweizer R (2019) Climate pushers or symbolic leaders? The limits to corporate climate leadership by food retailers. *Environ Polit* 28(1):64–86. <https://doi.org/10.1080/09644016.2019.1521947>
- EU. European Commission (2020) A Farm to Fork Strategy for a fair, healthy, and environmentally-friendly food system. COM 381 final. Brussels: European Commission. <https://eur-lex.europa.eu/legalcontent/EN/TXT/?uri=CELEX:52020DC0381>. Accessed 28 April 2022

- FAO (2021) Food systems account for more than one-third of global greenhouse gas emissions. Food and Agriculture Organisation of the United Nations. <https://www.fao.org/news/story/en/item/1379373/icode/>. Accessed 28 April 2022
- Galli F, Favilli E, D'Amico S, Brunori G (2018) A transition towards sustainable food systems in Europe. Food policy blueprint scoping study. Laboratorio di Studi Rurali Sismondi, Pisa, Italy, ISBN: 9788890896040
- Godemann J (2021) Communicating sustainability. Some thoughts and recommendations for enhancing sustainability communication. In: Weder F, Krainer L, Karmasin M (eds) The sustainability communication reader. Springer, Wiesbaden, pp 15–29. https://doi.org/10.1007/978-3-658-31883-3_2
- Gray LM, Wong-Wylie G, Rempel GR, Cook K (2020) Expanding qualitative research interviewing strategies: zoom video communications. *Qual Rep* 25(5):1292–1301. <https://doi.org/10.46743/2160-3715/2020.4212>
- Hansen A, Machin D (2013) Researching visual environmental communication. *Environ Commun* 7(2):151–168
- Hartmann C, Siegrist M (2017) Consumer perception and behavior regarding sustainable protein consumption: a systematic review. *Trends Food Sci Technol* 61:11–25. <https://doi.org/10.1016/j.tifs.2016.12.006>
- Heide M, von Platen S, Simonsson C, Falkheimer J (2018) Expanding the scope of strategic communication: towards a holistic understanding of organizational complexity. *Int J Strateg Commun* 12(4):452–468. <https://doi.org/10.1080/1553118X.2018.1456434>
- Horne RE (2009) Limits to labels: the role of eco-labels in the assessment of product sustainability and routes to sustainable consumption. *Int J Consum Stud* 33(2):175–181. <https://doi.org/10.1111/j.1470-6431.2009.00752.x>
- Huang Y, Lenzen M, Weber CL, Murray J, Matthews H (2009) The role of input-output analysis for the screening of corporate carbon footprints. *Econ Syst Res* 21(3):217–242. <https://doi.org/10.1080/09535310903541348>
- Ingenbleek PTM (2015) Price strategies for sustainable food products. *Br Food J* 117(2):915–928. <https://doi.org/10.1108/bfj-02-2014-0066>
- IPCC (2022) Climate Change 2022: Impacts, adaptation and vulnerability. In: Pörtner H-O, Roberts DC, Tignor M, Poloczanska ES, Mintenbeck K, Alegría A, Craig M, Langsdorf S, Lösschke S, Möller V, Okem A, Rama B (eds) Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, UK and New York, NY. p 3056. <https://doi.org/10.1017/9781009325844>
- ISO 14040 (2006) Environmental management—Life cycle assessment—principles and framework—AMENDMENT 1. <https://www.iso.org/obp/ui/#iso:std:iso:14040:ed-2:v1:amd:1:v1:en>. Accessed 28 April 2022
- 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>
- Kemper J, Ballantine P (2019) What do we mean by sustainability marketing? *J Mark Manag* 35:1–33. <https://doi.org/10.1080/0267257X.2019.1573845>
- Knox B (2000) Consumer perception and understanding of risk from food. *Br Med Bull* 56(1):97–109. <https://doi.org/10.1258/0007142001903003>
- Koch CH (2020) Brands as activists: the Oatly case. *J Brand Manag* 27(5):593–606. <https://doi.org/10.1057/s41262-020-00199-2>
- Kostova I (2019) Eco-labels as a commitment to responsible production practices. *Econ Altern* 2:251–262
- Leach AM, Emery KA, Gephart J, Davis KF, Erisman JW, Leip A, Pace ML, Dodorico P, Carr J, Noll LC, Castner E (2016) Environmental impact food labels combining carbon, nitrogen, and water footprints. *Food Policy* 61:213–223. <https://doi.org/10.1016/j.foodpol.2016.03.006>
- Maxwell J, Rothenberg S, Briscoe F, Marcus AA (1997) Green schemes: corporate environmental strategies and their implementation. *Calif Manag Rev* 39:118–134. <https://doi.org/10.2307/4116590>
- Nicholls J, Drewnowski A (2021) Toward socio-cultural indicators of sustainable healthy diets. *Sustainability* 13(13):7226. <https://doi.org/10.3390/su13137226>
- Nowell LS, Norris JM, White DE, Moules NJ (2017) Thematic analysis: striving to meet the trustworthiness criteria. *Int J Qual Methods* 16:1–13
- Peschel AO, Grebitus C, Steiner B, Veeman M (2016) How does consumer does 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>
- Pezzullo P, Cox R (2018) Environmental communication and the public sphere, 5th edn. Sage publications, Thousand Oaks
- Pulkkinen H, Roininen T, Katajajuuri J-M, Järvinen M (2016) Development of a climate choice meal concept for restaurants based on carbon footprinting. *Int J Life Cycle Assess* 21(5):621–630. <https://doi.org/10.1007/s11367-015-0913-8>
- Reinholdsson T, Hedesström M, Ejelöv E, Hansla A, Bergquist M, Svenfelt Å, Nilsson A (2023) Nudging green food: the effects of a hedonic cue, menu position, a warm-glow cue, and a descriptive norm. *J Consum Behav* 22(3):557–568. <https://doi.org/10.1002/cb.2129>
- Röös E, Sundberg C, Hansson P-A (2014) Carbon Footprint of food products. In: Muthu SS (ed) Assessment of carbon footprint in different industrial sectors, vol 1. EcoProduction, pp 85–112. https://doi.org/10.1007/978-981-4560-41-2_4
- Schoeneborn D, Trittin H (2013) Transcending transmission: towards a constitutive perspective on CSR communication. *Corp Commun* 18(2):193–211. <https://doi.org/10.1108/13563281311319481>
- Sharma NK, Kushwaha GS (2019) Eco-labels: a tool for green marketing or just a blind mirror for consumers. *Electron Green J* 1(42)
- Sherry J, Tivona S (2022) Reducing the environmental impact of food service in universities using life cycle assessment. *Int J Sustain High Educ*. <https://doi.org/10.1108/IJSHE-06-2021-0224>
- Silvi M, Padilla E (2021) Pro-environmental behavior: social norms, intrinsic motivation, and external conditions. *Environ Policy Gov* 31(6):619–632
- Tan M, TanKhoo RBHH (2014) Prospects of carbon labeling—a life cycle point of view. *J Clean Prod* 72:76–88. <https://doi.org/10.1016/j.jclepro.2012.09.035>
- Terlau W, Hirsch D (2015) Sustainable consumption and the attitude-behaviour gap phenomenon—causes and measurements towards a sustainable development. *Int J Food Syst Dyn* 6(3):159–174
- Torelli R, Balluchi F, Lazzini A (2020) Greenwashing and environmental communication: effects on stakeholders' perceptions. *Bus Strateg Environ* 29(2):407–421. <https://doi.org/10.1002/bse.2373>
- UNFCCC (2016) Summary of the Paris agreement. United Nations Framework Convention on Climate Change. <https://unfccc.int/resouce/bigpicture/>. Accessed 28 April 2022
- Wells V (2014) Behavioural psychology, marketing, and consumer behavior: a literature review and future research agenda. *J Mark Manag* 30(11–12):1119–1158. <https://doi.org/10.1080/0267257X.2014.929161>
- Winterstein J (2022) Nudging and boosting towards sustainable food choices—a systematic literature review of cognitively oriented measures. In: *Products for Conscious Consumers*, pp 113–132. <https://doi.org/10.1108/978-1-80262-837-120221007>
- WWF (2023) The WWF Sweden One Planet Plate [Online]. The World Wide Fund for Nature. Available at: <https://www.wwf.se/mat-och-jordbruk/one-planet-plate/one-planet-plate-english/#background>. Accessed 20 Aug 2023

Zander K, Feucht Y (2018) Consumers' willingness to pay for sustainable seafood made in Europe. *J Int Food Agribus Mark* 30(3):251–275. <https://doi.org/10.1080/08974438.2017.1413611>

Zralek J (2017) Sustainable consumption in a trap: attitude-behavior gap and its rationalization. *Oeconomia* 2:281–289