

Preface

The following article has been developed during the final semester of the Master of Environmental Management and Sustainability Science at Aalborg University, 2023. The article is a product of the performed work during a four-month period, and is written in the style of an article, with the aim of submitting it to the scientific journal of *Sustainable Consumption and Production*.

The process of writing this article has built upon the foundation of a State of the art, expanding on the phenomenon of how food labels affect consumers and their consumption. Through an iterative process, where the aim of the state of the art changed during each process, a knowledge gap in the research of multi-dimensional sustainability food labels was identified and selected as the research problem. Based on this selected problem, additional research was conducted in the field of sustainable purchases and sustainable diets, from the approached of behaviour change and practice theory, to get a nuanced perspective on how food labels affect consumers, which is often not presented in the literature. To get an in-depth understanding of the inner workings of consumers during their grocery shopping, and how they interact with food-labels, a workshop was designed, and three workshops with different participants were conducted. As the article is in a limited format, and the work that has preceded it can not be fully included in the article, a number of appendices are developed. These include an extended Introduction and State of the art, extended Methods, and a full workshop guide. The appendices will be references throughout the article, where it might be relevant for the reader, to gain additional information. Additionally, the audio files are also attached as appendices, but are however not referenced.

We want to thank our supervisor Søren Kerndrup, for supporting us through this process, with both professional and personal advice, and for the always interesting and inspiring conversations, which have led to reflections and arguments included in this body of work. We also want to thank the participants attending the workshops, as they have been a main source of data and has led to lengthy discussions on the implications and outcomes included in this body of work.

Reflections

We want to note that despite *Planet score* being a multi-dimensional sustainability food label, it is not a food label that covers all dimensions of sustainability. When looking at the parameters that it measures, it mainly covers two of the three pillars in sustainability; environmental and social sustainability, however it only covers a few parameters of social sustainability e.g. human toxicity.

When discussing the research proceeding this article, reflections around the meaning of grocery shopping arose. From the practice theory, the meaning behind a practice often encompasses a certain direction of the practice. However, as we have discussed, the fundamental meaning of the practice, grocery shopping, cannot be changed, as it at its core, is merely a way to collect food, which we need

to nourish our bodies and survive. This meaning of the practice might have different layers, and with the privileged lives we live in this time and place, other meanings might be added. However, the fundamental meaning is still at its core. However, what we in this research are aiming at, is not to change the meaning of grocery shopping, it is mainly, to understand if the way we perform this practice can be changed, so that we can keep nourishing ourselves.

Negotiating multiple sustainability dimensions: How does it affect consumers in their grocery shopping?

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Abstract

As current global food systems are increasingly contributing to land degradation, desertification, and loss of biodiversity, there is an increasing political interest in providing consumers with labelling schemes to choose sustainable food products. With consumers having an increased interest in the impacts of food products and sustainable diets, multi-dimensional sustainability food labels are slowly emerging on the market. The research on these labels is however limited, and the effects it has in guiding consumers is not well understood. In this study, we examine how the multi-dimensional sustainability food label *Planet score* guides and influences consumers in their negotiation process, and how this compares to the current single-dimensional sustainability food-labels, in a Danish context of mostly young adults. We examine this on the basis of a conceptual framework building on elements both from practice theory and the COM-B model, and through the qualitative method of workshops, where participants divided into groups according to if they do/not value sustainability when grocery shopping. The findings show that *Planet score* can act as a tool for consumers to assess the overall impacts of food products, and compare between food categories, where most find it easing their negotiation process when comparing products. Furthermore, the confronting feature of the overall score raises the consumers' awareness of the impacts of their food purchases, which was not found to be the case for the current single-dimensional sustainability food labels. However, the influences identified from the findings, indicate that the *Planet score* is able to make incremental changes to consumers' negotiation process. The findings indicate that to foster radical change the *Planet score* label can act as an implement, amongst a multitude of other instruments, to simultaneously change food culture, to allow more radical dietary changes to be accepted. The findings from this study adds to the limited body of knowledge of how multi-dimensional sustainability food labels influences and guides consumers.

Keywords: Food labels, multi-dimensional, consumer journey, routinisation and reflexivity, practise theory, behaviour change, negotiation process

1. Introduction

With a growing population and a growing need for feeding the population, the global food production has increased rapidly since the 1960s [1]. This has changed the global food systems, which are estimated to be responsible for 21-37% of the world's total greenhouse gas today [1]. With an expansion of land use, intensification of the areas used for food production, and the increase of climate change, the current global food systems are contributing to land degradation, desertification, and loss of biodiversity [1]. See Appendix A for further research.

As an attempt to mitigate this and change the current food system, the development of sustainable food systems has currently been expressed in the European Union's latest strategy 'European Green deal', stating an ambitious goal of becoming 'the first climate neutral continent by 2050'. As a part of reaching the goal, initiatives are proposed, where the 'Farm-to-Fork' strategy is focusing on a healthy food system for people and the planet, to reduce greenhouse gas emissions and climate change, by developing a 'sustainable food labelling framework' which should help consumers make every day sustainable choices [2].

On a societal and individual level, the discourse is also changing, and sustainable and ethical consumption is undoubtedly a current global trend [3, 4]. Consumers dietary patterns

have had a noticeable change over the last decade, where an increased focus on health and environmental implications among the consumers, have led to a growing consumption of plant-based food products [5, 6]. A survey by the 'Euromonitor International Lifestyle' from 2021 [7], found that 3.4% of the Europeans follows a vegan diet, 11.1% follows a flexitarian diet and 23% have limited their intake of meat. However, according to IPCC, the need for a global change towards a healthier and more sustainable diet among the world's population is still needed, to reduce land use, eradicating poverty, and eliminating hunger [1].

Studies show that obstacles to dietary changes may be how consumers underestimate the environmental impacts of the food products they buy, and that consumers' knowledge levels of food's environmental impact is generally low [8, 9]. Findings show that the lack of knowledge of the environmental impact from the consumer's purchasing decisions, makes the consumers unaware of the benefits of shifting away from high-energy and high greenhouse gas emission food products [9], and that the perceived environmental impact of foods have an influence on the consumers' food habits [10]. Studies also show that Europeans perceive food labels as one of the most trusted sources of information, and that information on food products

are to a high degree linked to consumers' perceptions of product quality [11]. A survey of European consumers' attitudes towards sustainable food from 2020, shows that 57% of the European consumers want more information about the food they buy, where they want to make sustainability front-of-pack labelling mandatory [12]. These findings indicate that consumers have a motivation to change their behaviour but lack information to make the right choices.

1.1. Food labels and their role in creating sustainable choices

Different sustainability food labels have been present since the 1980s, where different dimensions of sustainability labels are presented: health (e.g., warning labels), ethical (e.g., animal welfare), social (e.g., fair-trade), and environmental (e.g., organic and carbon footprint) [13, 14]. The labels represent different attributes, which consumers rely on, as these cannot be observed or verified by the consumer themselves. However, many of these single-dimensional¹ food labels do not cover all sustainability dimensions of consumer's concerns. Therefore, consumers must choose between many labels representing different dimensions such as animal welfare, organic, fair-trade etc. The current labels can hereby cause a conflict for consumers when food labels are conflicting with each other, e.g., animal welfare and climate impact [14].

Recently, the French government has introduced a pilot project for the development of a sustainability label, the 'Planet score', which combines multiple sustainability dimensions in one label, including environmental impacts, climate change, human health and toxicity, resources, biodiversity and ecosystems, pesticides, and animal welfare, see figure 1. Additionally, the impacts are summarised on an overall score, ranging from A to E, making it a multi-level label², whereas most current sustainability labels are binary.



Figure 1: Planet score

The multi-dimensional sustainability food label represents an overall score from A to E, which is based on an attributional LCA and qualitative assessments of the subcategories: pesticides, biodiversity and climate. for further information see [15]

The intention behind the label is to help consumers make sustainable choices more easily, while reducing the number of

food labels on the market [15]. Multi-dimensional sustainability food labels are however still new on the market, and research of how consumers perceive them, and which effect they cause on the consumers' purchases, are still not well understood [16].

2. State of the art

To understand the phenomenon of how multi-dimensional sustainability food labels affect consumers and how they compare to current sustainability food labels, we examine the current field of literature, to get a broad understanding on the phenomenon.

2.1. Effectiveness of sustainability food labels

The current literature is showing conflicting results on how effective labels are at influencing a consumer's purchases, both when studying single-dimensional and multi-dimensional food labels.

Through several quantitative and experimental studies, it is shown that food labels presenting information about single dimension of sustainability, influences consumers' purchases [17, 18, 19, 20, 21, 22], but it should be noted that research also shows that other factors have an influence, such as price, motivation, demographic etc., as demonstrated in several literature reviews and studies [23, 18, 24, 25].

Other studies show that single-dimensional sustainability food labels have a lesser effect on consumers purchases. Grunert et al. [26] found that "[...] sustainability labels currently do not play a major role in consumers' food choices, and future use of these labels will depend on the extent to which consumers' general concern about sustainability can be turned into actual behaviour" [26, p.1]. This was later elaborated on by Ran et al. [23], who found that "[...] information provided at the point of purchase, as a standalone intervention is unlikely to shift behaviour" [23, p. 654], because "[...] underlying motivations, beliefs, and values are often overridden at the moment of decision-making by quick and unconscious decision-making [...]" [23, p. 653].

Despite the low level of research on multi-dimensional sustainability food labels, a few studies have researched the effect they have on consumer purchases. In an experimental study on the effectiveness of multi-dimensional sustainability food label and their ability to close the 'attitude/behaviour-gap', Vlaeminck et al. [22] showed that "[...] consumer attitudes translate into more corresponding eco-friendly behaviour; when the eco-friendliness information of the food products are more accessible"[22, p. 12], indicating that more easily accessible information has the potential of changing consumers purchases. The role of multi-dimensional sustainability labels in consumer purchase choices has also been questioned by Brown et al. [27] who argues that multi-dimensional sustainability labelling is unlikely to foster behaviour change but will instead "[...] target small incremental changes in different levels and actors in the food system, within both individuals and organisations"[27, p. 138].

However, Sonntag et al. [14], examined consumers' willingness to pay (WTP) for products labelled with a combination of

¹Single-dimensional sustainability food labels represent criteria within a given topic, but may also contain a few criteria within another sustainability aspect, because this relates to the overarching topic

²Multi-level labels gives products a score, ranking from high to low, whereas 'traditional' labels are binary, where the product is either receiving the labels or not at all.

several single-dimensional sustainability food labels conflicting in high and low score of sustainability, to see how this affects consumers' purchase situation. They found that high levels of sustainability increased consumers WTP for a sustainable product, whereas a low level of sustainability decreased the consumers' WTP. This is supported in by Tobi et al. [24], who found that when several food labels representing multiple dimensions of sustainability are combined on the product, the consumers' WTP increases.

New research shows that consumers have a journey when grocery shopping (before, during and after shopping), and findings show that information provided throughout the process is needed in different formats from different channels, to reflect on their consumption and change their purchases [23]. This approach of viewing grocery shopping not as a single activity, but as a process that is influenced at a time and place outside the shopping mall, is relevant as it raises the question on sustainability food labels: *How effective are sustainability food labels when they are only able to influence consumers during shopping, at a time and place when they are more influenced by other factors?*

2.2. Sustainable consumer purchases

There is not much knowledge about how consumers make decisions about their grocery shopping [28]. However, the following sections show the current literature on sustainable consumption and the use of sustainability labels from two different approaches, which are generally used to examine behaviour. The approaches consist of an approach focusing on cognition and psychology and another approach focusing on social practices. See Appendix A for further research.

2.2.1. The influence of knowledge and motivation

Consumers' understanding of sustainability is important when examining sustainability food labels, where Grunert et al. [26] have found that the level of understanding can have an influence on how consumers are motivated to use sustainability labels when choosing between food products. Grunert et al. [26] argue that consumers' understanding of sustainability food labels is closely related to awareness, and to the extent that labels can communicate what they stand for, e.g., by being self-explanatory.

Research further shows that consumers with higher knowledge scores of environmental factors are more likely to combine a sustainable menu [29], which indicates that increasing the public knowledge of the environmental impacts of foods, may have a positive effect on consumers' ability to make environmentally friendly food choices. This is also concluded in studies by Peschel et al. and Grunert et al. [30, 26]. A systematic literature review by van Bussel et al., also concludes that consumer information and knowledge is a key element for changing behaviour towards more sustainable food choices in the future [31].

These findings show that consumers' competences in using their knowledge when making food purchases is a factor for making more sustainable choices, and that increased knowledge

might have an impact on the motivation for making more sustainable food purchases.

2.2.2. Consumer practices and sustainable purchases

Analysing sustainable food consumption through the lens of practice theory is not well researched, despite many authors applying practice theory to general sustainable consumption [32, 33, 34]. For extended research see Appendix A. However, research shows that it is important to be aware, that consumers' food-related everyday practices contain many automated action patterns, which are culturally embedded and reflected in social institutions and collective action patterns, which consumers rarely questions [35]. Some research has been conducted on how practices influence food consumption. Halkier [36] argue that food consumption is a "[...] *complex social phenomenon*" [36, p. 12], and that consumers are on one hand conditioned by their practices, while also being able to change. Brons & Oosterveer [37] argue that "[...] *buying sustainable food is connected to numerous other practices in many different ways*" (e.g., shared meanings, bundles of practices with the aim for more sustainability and the competition of time). Lund [35] and Holm & Kristensen [4] argue, that the practical challenges of changing to a more sustainable diet is linked to the interaction between the automatic patterns in our everyday life and the sustainable consumption that the consumer has a desire to implement [35]. They also found that food culture revolving around meat has an influence on what is deemed as a good meal. 70% of warm meals, in western countries, have meat as the main ingredient, and that consumers often associate meals without meat, as a meal that doesn't satisfy them [35].

How practices within a consumer's grocery shopping are affected, has also been researched. Gram [38] and Holm & Kristensen [4] emphasise the factor of time as having an influence on the consumers' purchases, such as consumers' rhythm of meals during the day. Moreover, their findings show that the time pressure of the rush-hour, has an influence on what consumers purchase and how they shop for groceries [38]. When linking sustainable consumption and everyday practices together, Gram [38] and Holm & Kristensen [4] argue that a products' symbolic consumption is how consumers express their ideologies and feelings when shopping. The symbolic consumption is focused on the consumer's desires and dreams created by moral issues associated with food production, where the consumers' independent agency is where choices can be expressed [38]. They further argue that the supermarket is a stage where consumers can perform and express themselves as they would like to be seen by others [38].

The research on food labels through the lens of practice theory is modest. However, it has been applied by Spaargaren et al. [39] in a study of how Carbon footprint food labels influence consumers' practices. In this experimental case study, carbon footprint food labels were introduced in a lunch canteen and found that the introduction of the new information acted as a disruption to the participants' shared routines in the canteen [39]. The studied case is moderately comparable to a supermarket, as the practices in a canteen can be argued to be more socially anchored and robust than in a shopping situation. This is

also supported by Ali [40], who researched the effect of green marketing (e.g., eco-labelling, green branding, and green advertising) on organisations and consumers. He found that consumers tend to not incorporate new information if this has not been practices, and that they rely on existing practices [40].

These findings show that consumers' various food practices are factors for both more and less sustainable food purchases. The complex web of these practices and how they influence the consumer, gives another perspective of how consumers' food purchases can be changed, and is relevant to consider in the context of multi-dimensional sustainability food labels.

2.3. The negotiation-process of grocery shopping

The findings from the current literature shows that consumers are influenced by many factors, and both the psychological and practice theoretical approach provides relevant perspectives on the complex phenomenon. How consumers negotiate between these factors when grocery shopping, has been attempted to be characterised, by authors adhering to both approaches.

Gram [38] and Holm & Kristensen [4] argue that consumers are both reflective and habit-driven, where routines play a significant role [38]. They further argue that a lot of purchases exist without many reflections, where routines decide which groceries to pick. Consumers make their choices within a field of discourses about nutrition, efficiency, marketing, and climate dilemmas, which create limitations and demands that can be in a direct conflict with the intended shopping list [38].

This is also supported by Halkier [36] where she argues that consumers both rely on routinisation and reflexivity to make food purchase choices. She characterised three types of relations: *Routinisation of reflexivity*, *Routinisation as relief from reflexivity* and *Ambivalence between routinisation and reflexivity*. Parallels can also be drawn to Kahneman's dual process thinking, where two systems are characterised as the instinctive (intuitive) system and the deliberate (reflective) system [41].

We further argue that these concepts of a deliberate, conscious, and reflexive mode and an intuitive, unconscious, and routinised mode, are describing and characterising the negotiation-process that consumers have within themselves, weighing all the different factors that influence their food purchases. We argue that this negotiation between the two modes is crucial to understand when examining how consumers use food labels, and the potential for multi-dimensional sustainability food labels to guide consumers with their food purchases.

2.4. Aim of paper

This paper seeks to understand how multi-dimensional sustainability food labels can facilitate a change in the negotiation process of the consumer's grocery purchases. This will be researched through three steps where we attempt to answer the following three questions:

- How can multi-dimensional sustainability food labels guide consumers in their negotiation process, to adopt sustainable food purchases?
- What characterises and influences a consumers' negotiation process, through the consumer journey?
- What are the current constraints for consumers to not adopt sustainable food purchases using single-dimensional food labels?

This will be examined in a Danish context, with Danish consumers. However, countries with similar conditions and culture, might be able to draw parallels.

3. Conceptual framework

To understand the negotiation-process that consumers undergo when purchasing groceries, and to understand it both from a practical theoretical perspective and psychological perspective, we argue that it is relevant to take the point of departure in Halkier's concept of routinisation and reflexivity [36]. Despite it originating from practice theory, the proposed concepts encapsulate the interplay between the two approaches. As explained through Giddens' [42], Halkier [36] characterises routinisation as: "[...] when understandings and engagements in practices are based on tacit knowledge through practical consciousness and procedures in practices are taken for granted" [36, p. 9]. Whereas reflexivity is characterised as "[...] when understandings, procedures, and engagements in practices are explicit and reflected upon through discursive consciousness" [36, p. 9].

Halkier [36] further elaborates on how reflexivity and routinisation can interact with each other in a shopping situation. Three relationships are defined as followed; *Routinisation of reflexivity* is characterised by reflexivity becoming a part of the daily routines, and the consumer doesn't use extra effort to reflect on their purchases [36]. *Routinisation as relief from reflexivity* is characterised by the consumer relying on routines, where the consumer doesn't need to reflect on their choices. The consumer trusts in society and outside bodies in guiding them [36]. *Ambivalence between routinisation and reflexivity* is characterised by conflict between being reflective of the consequences of their food consumption and the urge to rely on routines, as incorporating reflexivity requires time and effort [36].

Halkier [36] argues that the two first types of relationships between routinisation and reflexivity are more beneficial to foster environmentally friendly food consumption, as *routinisation of reflexivity* incorporates reflexivity in everyday life, and eliminates the inconvenience of using more effort on reflections [36]. *Routinisation as relief from reflexivity* is beneficial as consumers lay their trust in others [36], this is, however, only on the condition that food labelling schemes are competent in identifying the right products. Halkier emphasises that the main argument of this concept is that "[...] environmental performances are neither only reflected nor only routines, rather the two bodily/mental procedures are intertwined with each other" [36, p.9]. These concepts highlight that there is a relationship and an interaction, and this complex interaction can manifest in different ways for each consumer.

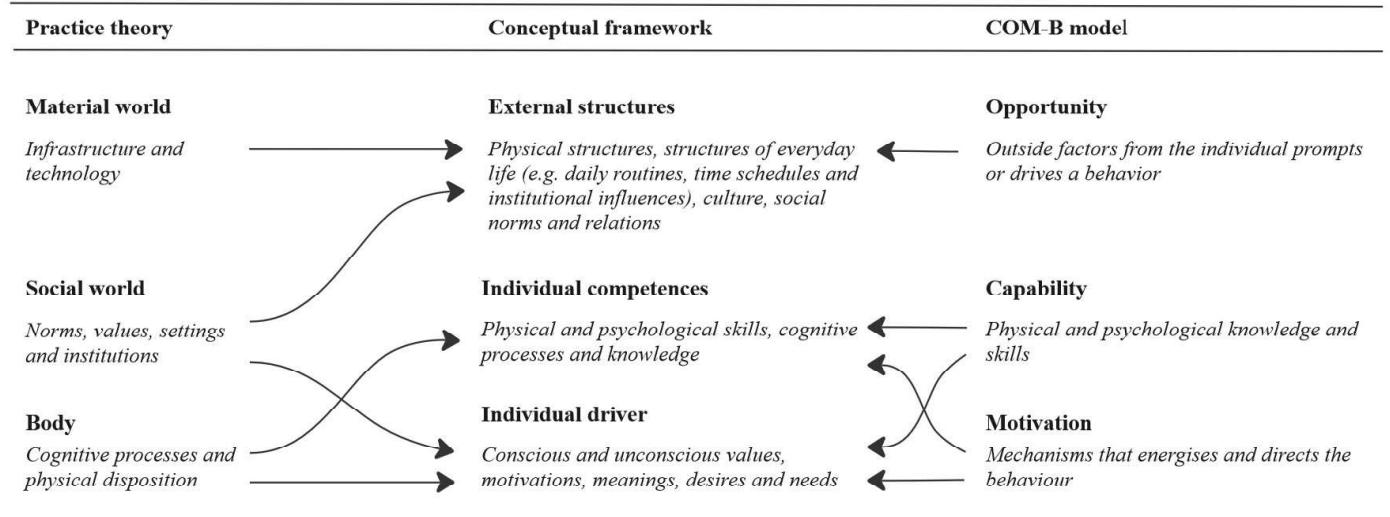


Figure 2: Illustration of the combined elements.

Arrows from the elements from practice theory and the COM-B model shows how the three elements are combined

3.1. Elements affecting routinisation and reflexivity

To analyse these modes of routinisation and reflexivity, we use concepts both from Practice Theory and Mische's COM-B model [43], to get a psychological and practice theoretical perspective on the phenomenon. The COM-B model is a framework that takes the point of departure in the individual and how their behaviour can be changed. The COM-B model is a framework build to target a specific behaviour, with the aim of changing it. It is built upon three elements that are determining for changing behaviour; *Capability* (physical and psychological knowledge and skills), *Opportunity* (Outside factors from the individual that prompts or drives a behaviour) and *Motivation* (mechanisms that energises and directs the behaviour) [43]. It is characterised as a 'behaviour system' where the elements and the behaviour itself are affecting each other [43]. By mapping these three elements, it can be understood how to change the behaviour. In social practice theory, there are also generally three elements, however they differ for each author in the literature. Shahakian and Wilhite [44] have discussed and conceptualised the three elements in the context of sustainable consumption: *The body* (cognitive processes and physical dispositions), *the material world* (infrastructure and technology), and *the social world* (norms, values, settings, and institutions). These elements influence the stubbornness of a practice, and the practice is in turn reproducing itself. By changing any of the element of a practice, the practice can potentially change or dissolve[44].

Each approach characterises different aspects of how to change consumers' actions and the consumption that they are producing as a result. The COM-B model targets the individual and their personal dispositions, whereas practice theory targets the socially anchored practices which are unconsciously affecting the individuals. To account for both approaches to understand the complex relation and interaction between the two approaches we propose three redefined concepts: *External structures*, *individual competences*, and *individual drivers*.

These redefined elements pull concepts both from Practice Theory and the COM-B model, with an aim of understanding what is determining for consumers in a shopping situation. On figure 2 the elements from practice theory, the COM-B model, and our redefined elements are described, to illustrate how the redefined elements are relating to the two different approaches.

External structures include physical structures (e.g., layout of supermarkets and online food stores), structures of everyday life (e.g., daily routines, time schedules and institutional influences), social norms and culture. These structures set the frame for how and what consumers can perform in their daily life. Some are more rigid, e.g., physical structure, and others are more flexible, e.g., social norms. Some external structures allow for better relations between reflexivity and routinisation, where others hinder it. The external structures are acting like frames, which individual are navigating within. *Individual competences* include physical and psychological skills, cognitive processes, and knowledge. These competences are often learned when growing up, and are therefore also affected by society and culture, but they can also be learned later in life. The level and type of competences is determining for how consumers assemble a meal, write a shopping list, and how they reflect on and assess their purchase choices. They act as tools which consumers use to navigate within the external structures. *Individual drivers* include both conscious and unconscious values, meanings, motivations, desires and needs. These conscious and unconscious drivers can both enable and hinder consumers in engaging in new types of relations between reflexivity and routinisation. Depending on what types of drivers are present for the consumer, they navigate differently within the external structures, and they are interested in learning different types of competences to assist them.

Figure 3 illustrates how the three elements are affecting each other. The external structures act as the outer framework, the individual competences as tools that allow consumers to navigate according to their individual drivers. How these three ele-

ment affects each other, will result in different relations between routinisation and reflexivity. The three types of relations, as defined by Halkier [36], *Routinisation of reflexivity*, *Routinisation as relief from reflexivity*, and *Ambivalence between routinisation and reflexivity*, are therefore a result of the three elements.

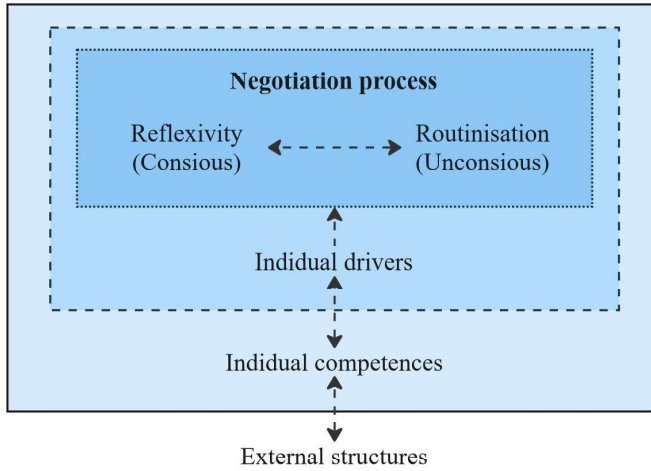


Figure 3: Illustration of the phenomenon of the negotiation process. The illustration shows how the phenomenon of the negotiation process is characterised by the relationship between routinisation and reflexivity, and the three elements.

By combining the elements from the COM B-model and the practice theory, we strive to cover the key elements that characterise the relationship between routinisation and reflexivity, from both a psychological and practice theoretical perspective. These three redefined elements are therefore used as a foundation for the data generation and analysis, to further understand how multi-dimensional sustainability food labels can foster a better relationship between routinisation and reflexivity that results in a sustainable food consumption, as explained by Halkier [36].

4. Methodology

4.1. Research approach

We approach this body of work from social constructivism, as we strive to "[...]look for the complexity of views, rather than narrowing meanings into a few categories or ideas" [45, p.8]. Therefore, we seek to understand the complexity of how consumers navigate in their negotiation-process. We also take inspiration from phenomenology, as we aim at understanding consumers and their experiences, and how they view their world [46]. The aim is to understand their unique experiences when in a shopping situation, and what is determining for them when negotiating. We also draw on critical realism, as we are not only interested in the factors that consumers are aware of, but we strive to also uncover underlying factors and processes which might affect them [47]. Using concepts of theory as a lens to understand the studied phenomenon, we view the chosen theory as a construction of reality [48]. We see that the selected

lens is only one angle on reality, which it is adequate in explaining, but reality is too complex to describe fully through theory [48]. However, we view theory as a relevant tool to explain the studied phenomenon and as a way of communicating information.

In the approach to our research, we acknowledge the subjectivity of our characters. We as researchers have preconditions that we bring to our study, and with an aim of using qualitative methods, reaching full objectivity is difficult [45]. However, by examining the approach, chosen theories, and methods we can uncover underlying biases [45].

4.1.1. Study design

We use qualitative methods in this study as it is relevant when examining a subjective behaviour [46]. From the social constructivist approach, a workshop is chosen, as it creates a setting where participants' individual meanings and experiences, are negotiated in a collaborative environment [49]. The aim is not to only analyse consumers, but it is to design processes that allow participants to collectively generate data. From the philosophy of critical realism, applying the method of workshops, allows participants, as well as research, to create opportunities to uncover deeper meanings, underlying factors, and unconscious values, which neither the participants nor the researchers are aware of [49]. For extended methods on conducting workshops, including management and facilitation, see Appendix B.

4.2. State of the art

To lay the foundation of knowledge for this study, a state of the art in the field of single- and multi-dimension sustainability labels and consumer purchases is conducted. A thematic semi-systematic approach is chosen to gain most insights from different perspectives and approaches on the phenomenon. The aim is not to cover a specific field, as much as the aim is to cover a web of literature expanding from the core of the phenomenon. From the core of the phenomenon, several angles on the phenomenon are explored to gain a broader understanding of the problem at hand [45].

For the literature research, two databases were used: *Scopus* and *Web of Science*. A combination of different search words was used, including *food labels*, *consumer understanding*, *sustainability*, *multidimensional*, *practice theory*, *motivation*, *knowledge* etc. Furthermore, several articles are found through references from relevant articles linking to other articles and sources.

The sources included in the state of the art are chosen based on their relevance to the phenomenon and the problem at hand. The quality of the research and the research methods were also assessed, where scientific peer-reviewed articles were selected for the main portion of the state of the art. Grey literature was used additionally if relevant. The geographical scope is within the European Union, with a focus on Danish consumers. Literature looking into food labels not regarding sustainability was excluded unless it was relevant to other areas of the phenomenon.








Label	Fairtrade	MSC	State controlled organic	Rainforest alliance	European organic	State controlled animal welfare	International vegan
							
Focus	<i>Better wages and working conditions Ban on child labour and pesticides harmful to health</i>	<i>Sustainable fish stocks, minimizing environmental impacts, effective fisheries management</i>	<i>No pesticides, only 49 additives may be used, animals must have access to outdoor conditions</i>	<i>Protects human rights, livelihoods, climate and forests</i>	<i>Ban of chemical pesticides, GMO's and antibiotics. Crops are rotated</i>	<i>Focus on more space, better stable conditions, short transport time and outdoor areas.</i>	<i>Ensures food is not of animal origin.</i>

Figure 4: Single-dimensional sustainability food labels.

The figure shows selected labels used in activity one in the second part of the workshop. The name of the labels are presented in English, where some have been translated. The scope of the label is also presented, and which parameter the labels covers.

4.3. Workshops

4.3.1. Planning

In the planning phase, several factors were considered, such as planning a layout of the workshop to generate relevant data and finding suitable participants.

The workshops were designed to be conducted physically in a private room at Aalborg university, where the workshop could not be disturbed. The workshop was designed to last approximately two hours, with breaks in between. The workshops were recorded using a dictaphone during the activities, and all participants gave oral consent. The layout of the workshop is built upon the three sub-research questions, aiming at answering the main aim of the paper, see section 2.4. Therefore, the workshop is divided into three parts. Additionally, the conceptual framework is used as a guide to ensure that relevant data is generated to analyse how the three redefined elements affect the consumer's conscious and unconscious mind while shopping. For design of the workshop and the activities, see section 4.3.3, and for the full workshop guide, see Appendix D.

4.3.2. The participants' preconditions and interaction

Choosing the right participants is crucial, as it has an impact on the outcome of the workshop, and they are the main provider of inputs, ideas, and generated data during the workshop [50].

For the workshops, 11 individuals were selected divided into three workshop groups, with four or three participants in each. The first group is represented by four males who value sustainability in varying degrees when grocery shopping. Three of which are students, and the last is retired from his job. The second group is represented by four females who also valued sustainability relatively high when grocery shopping, all of which are students. The third group is represented by two females and one male, who all do not value sustainability highly while grocery shopping. Two of the participants in this workshop are students, and the last has a full-time job.

The division of the participants was planned to get different reactions on the workshop design. The third group represents a part of the 'average consumer' in Denmark, who do not

value sustainability highly while grocery shopping. By including these participants in the study, we get a more nuanced perspective on the negotiation process, and how it plays out for different groups of people. The demographics of the participants included in this study is not representative for the Danish citizens but represents different types of mindsets.

The difference in values and motivation towards sustainability between the two first groups and the second group is important, not only to get different reaction and perspectives on the phenomenon, but it also provides a 'safe space' for individuals to express their opinion when in a room with like-minded people.

4.3.3. Design of workshop and activities

The first part of the workshop has the purpose of mapping the consumer's negotiation process throughout their consumer journey (before, during and after shopping). This approach is inspired by research by Ran et al. [23] that showed that consumers' purchase is influenced by factors also present outside the supermarket and grocery shopping itself. This is also in line with the conceptual framework, as the three elements *external structures*, *individual competences*, and *individual drivers* are influencing the consumer not only during shopping, but in everyday life, at different times and places. As self-reported behaviour may be biased, and some consumers desire to present themselves as more responsible and sensible, than what one feels one is [4], an activity of an individual writing process is carried out to give participants time to reflect upon their individual consumer journey. As it can also be difficult for the consumer to remember how they act when shopping, because grocery shopping is often based on routines, participants were asked to reflect on their last shopping trip to the grocery store. Afterwards, participants are encouraged to share their individual thoughts. During the activity, artefacts are used to inspire participants to reflect on the more underlying factors at play. See workshop guide in Appendix D for a list of the used artefacts.

The second part of the workshop focus on the participants'




















Attributes	Example 1	Example 2	Example 3	Example 4	Example 5	Example 6	Example 7
Product	Organic milk 1,5% fat	Conventional milk 0,1% fat	Oat milk	Conventional beef 8-12% fat	Organic beef 4-7% fat	Plant based meat alternative	Tofu
							
Price	14,25 kr.	11,95 kr.	19,95 kr.	44,95 kr.	44,95 kr.	24,95 kr.	21,95 kr.
Label	Danish organic Animal welfare	Green key Animal welfare	No label	No label	Danish organic Animal welfare European ecology Green key	No label	European ecology
	 	 			  		
Origin	Denmark	Denmark	Northern Europe	Denmark	Denmark	Northern Europe	Bulgarien
Planet-score							

Figure 5: Artefacts used in the scenario activity

Three different milk products and four different protein-products with different food labels was introduced for the participants to understand how these would be used in a negotiation process.

understanding of sustainability and how they use the current sustainability food labels on the Danish market. It is divided into two activities. During the first activity, participants are asked to discuss how they relate different dimensions of sustainability with current single-dimensional sustainability food labels. This is design to uncover their perception of the labels and if there are any 'missing' aspects in the current labels. The list of the presented labels can be viewed in figure 4. In the second activity, participants are presented with products within the category of 'milk' and 'protein' of both plant-based and animal-based products, where they are asked to discuss and how they negotiate choosing between the products. The different products are presented with a price and different single-dimensional sustainability food labels (see figure 5 for an overview of the products). The aim is to examine the negotiation process in a scenario closer to reality, to make the discussions more tangible, and to examine which constraints there are for consumer to choose sustainable food items.

The third part of the workshop builds upon the previous activity, and the multi-dimensional sustainability label *Planet score* is introduced according to the different products. This activity is designed, to encourage discussions of how the *Planet score* compares with the current sustainability food labels, and to understand how this influences their negotiation process. To see pictures from the workshop see Appendix C.

4.3.4. Data treatment and analysis

For methods on data treatment see Appendix B In the process of treating the generated data, coding was used to cluster

relevant quotes into themes corresponding to the three phases of the consumer journey, and the conceptual framework, described earlier in section 3. Other topics and points, which did not adhere to the chosen framework, were also clustered [45]. Through an iterative process, the treated data was then further grouped into themes around the three sub-research questions, and the conceptual framework [45], which created the structure of the analysis.

For analysing what characterises the consumers' negotiations process, the treated data, coded for the consumer journey and the conceptual framework, was used to find common themes of how the three elements impact the negotiation process throughout the consumer journey.

To analyse how the current single-dimensional sustainability food labels and *Planet score* compares, several types of data were used. Data coded for positive/negative aspects of the labels, together with coded data for the conceptual framework, was used to analyse how the labels impact the consumers' negotiations process.

Findings from the two units of analysis were then used to understand how *Planet score* can influence and effect consumers' negotiation process.

5. Results from consumer journey

In table 6 a summary of the participants' reflection on their consumer journey (before, during, and after grocery shopping) is presented. From the results, it is outlined that the participants are influenced differently in both the planning phase, when at

the store, and after doing their grocery shopping. The findings show that the participants are influenced by different factors within the purchase situation, but they are also influenced by factors outside the supermarket, originating from the planning and after shopping phase. Below, general themes within the structure of the consumer journey are unfolded.

Before	During	After
<i>Most plan their shopping in advance</i>	<i>Most do small shops several times a week</i>	<i>Most get inspired for their next shopping trip by the internet, social media, cookbooks, TV-shows or box deliveries (måltidskasser)</i>
<i>Most plan from day to day, some for a week</i>	<i>Most do their grocery shopping on their way home (from work og school)</i>	<i>Others get inspired by colleagues' lunch or the canteen lunch</i>
<i>Most bring a written list, some plan on their phone</i>	<i>Most shop according to a shopping list, but have some spontaneous purchases too</i>	<i>When unpacking food products, some reflect on the packaging - if it can be recycled or if better solutions exist</i>
<i>Some use discount magazines when planning their meals</i>	<i>Participants choices are motivated by animal-welfare, locally produced, organic, quality, health aspects, close to expiration-date products.</i>	<i>Some read the products' declaration, serving suggestions or fun facts</i>
<i>Some plan to do their groceries at specific time slots of the day, to avoid rush hour</i>	<i>Choices in food products are limited by price and time</i>	
<i>Some plan according to the households needs and desires</i>	<i>Some get inspired of what to eat in the supermarket or aim for offers</i>	
<i>Different motivations for planning was identified: safe money, meat-free, one's own desires for certain meals, and the usual basic products</i>	<i>Most find high-end supermarkets more inspirational, than discount supermarkets</i>	
	<i>Some participants like to shop, others dislike it</i>	

Figure 6: Results from the participants consumer journey

5.1. Before grocery shopping

The 'before grocery shopping' situation is defined as the planning process, where consumers plan what they are having for dinner or what they need to purchase when going to the supermarket.

5.1.1. Social background and relations effecting their food choices.

Several of the participants are students and therefore have a low income. These participants mentioned that their stage in life now and their financial situation have an influence on how they plan their groceries and which products they tend to choose. One participant said: *"I often choose not to pick a product, depending on the price per kilo and how much it costs"*. Several explained how it is a tool for them to use discount-magazines to find the best offers and will plan their meals and grocery lists according to this. Price was seen by almost all the participants as a factor to consider when planning, and hereby

as a constraint when considering environmental concerns in their shopping. However, one participant explained that her reason for planning meatless was due to economic reasons, as meat is more expensive than vegetables. Financial situations, or a desire to save money, can therefore also work as a positive factor for choosing sustainably.

Some participants said that they felt influenced by their partner, family, or friends in their food choices. One participant, who used to be a vegetarian, switch back to eating meat when moving in with her boyfriend: *"He really appreciates eating meat [...] well, then we make dishes with meat, but we prioritise buying [...] products that are not so heavy for the environment"*. Social relations were discussed as a hinder in living a more sustainably concerned life. Participants, with little concern of the environment, found that they got influenced by social settings both positively and negatively. New knowledge from social relation made them reflect more on their choices, however, this could also foster a sense of bad conscience, due to being confronted about their non-sustainable choices.

5.1.2. Awareness of sustainability influencing choices

Many of the participants, whose awareness of sustainability is high, were more likely to plan their groceries meatless or keeping meat-proteins at a minimum. With a greater extent of knowledge on impacts from food production, participants were more likely to incorporate this in their decision-making, whereas consumers with lower awareness of sustainability tend to base their food choices on what they had a taste or desire for. Several participants explained they had changed their behaviour after getting more knowledge about food related environmental impact from either education, their social relations, or the media. Sustainable awareness seems to be a factor influencing consumers' grocery planning, actively incorporating environmentalism as a key factor. However, one participant said: *"I think we all know how bad beef is for the environment"*, but nevertheless the participants never changed his food choices to be more sustainable, which indicates that the level of awareness is not always a deciding factor for incorporating more sustainable food in their shopping habits.

5.2. During grocery shopping

The 'during grocery shopping' is defined as the situation of where the purchase take place. In this study, this would be in the supermarket, where the participants are doing their groceries.

5.2.1. Choices are affected within the supermarket

Many of the participants reported that their food choices are influenced by the atmosphere in the supermarket. Almost all the participants do their groceries during rush hour, where several expressed how *"annoying and irritating"* this can be, and some feel rushed and stressed when surrounded by others: *"I felt a bit more busy, because she was raising through REMA (Danish supermarket), even though I was not busy, as I was on my way home"*. Another participant expressed that this influences her ability to choose between products: *"If I look for information, and it takes up too much time, then I would be like*

'never mind' and then I'll just pick something". A few participants mentioned being too busy to stop and read about or compare products influenced their choices, others reported they like shopping and do not feel influenced by rush hour. Few participants mentioned that the store's layout, such as atmosphere, space, design, and display of food products have, to some extent, an influence on their choices of food. Some said that they get drawn by food products with yellow stickers (indicating an offer), others find inspiration from in-store information such as offers, recipes, food labels, and new products.

5.2.2. Individuals value as a driver for choices

All the participants described their personal value for choosing between food products. Some participants are influenced to a greater extent by health and nutritional factors, others weight country of origin, production conditions, and nature highly, some prioritise animal welfare when shopping and others have a strong focus on the amount of packaging of their food products when choosing. Others consider different aspects of sustainability when choosing between products, where one explained that she has a 'mental ranking list' of her priorities for choosing a product: *"I have set some mental rules for myself, where I tell myself: 'okay, vegetables have to be organic, also if it is just basic food items [...]. Then I would rather choose organic, as quantity is not as important to me as quality"*. Another participant had something similar, but it was more flexible: *"I have a sort of [...] prioritised list, [...] 'Well, now I've bought a lot of vegetables, so it also makes up for the fact that I haven't bought meat, so maybe it's okay that they're not organic, [...] I don't know if it is a justice system"*. The ranking system makes it easier for the participants to navigate a busy everyday life, where there is not always time to decide whether to choose one product over another. The so-called 'justice system', thus, makes their decision-making process easier, as it has been decided in advance what they can vouch for and what they cannot. The individual consumer's values are therefore identified to be determining for their choice of food products.

5.2.3. Price as a consistent factor

It is consistent among all the participants that price is influencing their negotiation-process when choosing between products. The participants with little awareness of sustainability prioritise price highly, and it was often mentioned as the main factor to consider when choosing between food items. A few participants will go for the lowest price consequently and explained that they are *'blinded by the price'*, and if the product have a sustainable food label, then it is just a *'bonus'*. Other participants are willing to spend more on products with an organic or animal-welfare food label, but only within a certain price limit. Several explained that there is a *'limitation'* where it is no longer valuable for them to spend money on. *"[...] if an organic product is twice the price as non-organic, then I would choose the non-organic. It should not cost twice as much"*. The barrier of a higher price of a more sustainable friendly product, overrides the motivating factor of concerns for the environment. However, according to the participants' reaction during the workshop, it was seen that the participants who have a high

awareness of sustainability, tend to have a greater willingness to pay for food-products if they are supporting a cause which they are motivated to contribute to. Individuals concern for the environment drives the participants to actively implement sustainable choices, whereas the participants with lower or non-concern seems to choose price before other factors.

5.3. After grocery shopping

The 'after grocery shopping' is defined as the time when the consumers unpack their groceries, reflecting on their purchases. Moreover, this phase is also defined as the phase of inspiration for the consumer's next shopping event.

5.3.1. Unpacking groceries

Almost all the participants reported that they do not read the information on the food products when unpacking or using them while cooking. Participants described it as *"I really don't look at it, not at all"*, *"I'm just unpacking my groceries"*, and one said: *"If I read anything it is the cooking time"*. Reading information and reflecting upon their food products was not as present and was seen by the participants as 'the ship has sailed' as they have already made their choice in the supermarket. However, more participants mentioned them being more aware of the amount of packaging from products, when they are unpacking their groceries. The need for packaging of food items were discussed between the participants, where it was mentioned that the design of packaging is seen as a motivational driver for choosing a product: *"Some packaging is easier to separate [...] I would like to reward them and buy their products"*. In general, the participants were not seen to reflect much about their groceries after shopping and, which is therefore not affecting their negotiation process for their next shopping event.

5.3.2. Inspiration for new dishes

The participants get inspiration for their next grocery shopping by the internet, social media, cookbooks or when seeing other co-workers' lunch. Others mentioned that they are more drawn by supermarkets' weekly offers when flipping through a discount magazine, or get inspired to use their leftovers, to avoid food waste. Several of the participants, who have incorporated meatless meals in their everyday life, said that this habit change has required some extra effort, where they had set off extra time and energy for a period, to learn how to cook in new ways. A participant who is vegetarian expressed: *"[...] (meatless dishes) have a lot of spices in them, which [...] you don't use in Danish cooking. [...] if you want to go that way, it's a good idea to stock up on your spices [...]. Otherwise, it can seem a bit unmanageable"*. However, another participant expressed that buying delivery boxes (måltidskasser) have inspired him to try more vegetarian food: *"Food delivery boxes have inspired me a lot. I've saved all the recipes, because I tried the halloumi burger (vegetarian), and... I'm completely in love with it"*. The motivational factor for learning new cooking skills and try out new tastes can be a constraining factor for planning sustainable dishes, as it requires time and energy to incorporate this in their

everyday life. However, a participant mentioned that buying a food delivery box was an easy way to gain inspiration to try dishes from the vegetarian kitchen, while learning new ways to cook.

5.3.3. The complex and dynamic consumer journey

The result from the workshops shows the complexity of how the participants are influenced by various factors within the different phases of the consumer journey. Most of the participants seems to be determining what they are going to buy in the planning process, influenced by the phase after grocery shopping, e.g., getting inspiration from social media. However, the participants also reported being influenced by factors during the shopping phase in the supermarket, showing that the consumer journey is not a simple process, where the consumer first plan, then go to the supermarket, and then get inspiration until their next shopping event. It must be noted that the consumer's path can shift between the phases, where the reflections after the groceries also can have a direct effect on the purchasing situation (see figure 7).

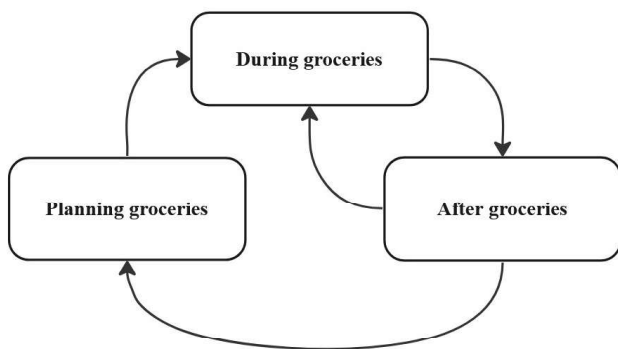


Figure 7: The complex and dynamic consumer journey
The different phases of a consumer journey affects one another, illustrating a complex and dynamic systems where the consumer's negotiation process gets influenced

The negotiation process is a complex system where different situations affect one another, changing from one purchase situation to another. No two purchase situations can be defined to be the same, as the individual is guided by different negotiation processes and reflections. By gaining an understanding of the consumer's shopping journey as a dynamic process which is influenced by many individual factors, both in the shopping situation but also outside the supermarket, it is possible to capture the complexity behind this, but also gain an understanding of where in the consumer journey the consumer's decision-making process becomes most affected.

5.3.4. Routinisation and reflexivity

As the consumer journey is seen as a complex and dynamic process, where consumers get influenced by various factors, it is relevant to examine how this influences the relationship between routinisation and reflexivity.

5.3.5. Consumers who value sustainability

In the purchase phase, it can be seen how the participants who value sustainability highly are characterised by a reflexive behaviour, where the use of food labels help to determine the outcome of their negotiation process. For many of the participants it could be seen, how food labels helps to guide them in making a choice between two food products, as their motivational factor for e.g., better animal welfare or fewer pesticides, help to determine which product they prefer. This action is determined by the individual's individual drivers, such as the underlying motivation, desire, or a need to support a given cause. We saw that several of those who value sustainability highly use the existence of food labels to express their ideologies and feelings about a given product, which was based on the individual's moral issues associated with the product's sustainable manufacture. These consumers thus also determine their choices based on their individual competences, since the motivation behind them necessarily lays behind an acquired awareness to a subject, which has subsequently given the individual a special feeling about a subject. For this reason, it can therefore also be argued that the individual's external structures also help to determine the action, since the individual consumer's underlying culture or the social structures in which the individual moves can be the defining foundation for the behaviour. The individual's negotiation process can be argued to be influenced by both their individual drivers, individual competences, and the external structures, as all three elements have formed and created their behaviour. However, we do see that participants who value sustainability when grocery shopping has a greater tendency to compromise with their own needs because they value the environmental consequences more highly.

Participants who value sustainability highly can be argued to be represented by Halkier's type "*Routinisation of reflexivity*", as the reflective element has become a part of their daily routines. This group of consumers reflects upon the consequences of their food consumption, where buying environmentally friendly products have become a part of their daily routines. Many of the participants describe how, over time, reflecting on their daily purchases has become a routine that they feel the need to fulfil, because they do not want to compromise with their individual passions or beliefs. The consumer whose routinisation is driven by reflexivity is not only driven by desires and needs, but also values other social and environmental needs, that does not only affect the individual's personal life. In this study, it is seen how consumers who value sustainability highly have tried to break the existing constraining factors that influence their negotiation process by incorporating necessary awareness and values into their individual beliefs.

However, it can also be argued that the consumer is not always in the reflexive element, as the consumer has also built routines around their everyday choices. This approach can be argued to be represented by Halkier's type "*Routinisation as relief of reflexivity*", where the consumer's behaviour is less influenced by the reflexive element, but more controlled by their routines. This consumer makes use of food labels as a guide in a shopping situation. The consumer reflects less, in the negoti-

ation process, upon the environmental consequences, as the reflective moment is taken over by the trust in labels to guide the individual to make sustainable choices, without the consumer needing to incorporate a normative commitment in their reflections.

5.3.6. Consumers who do not value sustainability

In the case of the participants who do not value sustainability highly, it can be seen how their purchases are characterised to a greater extent by a routinised behaviour, where the individual needs, desires, and wishes shapes their negotiation process. For many of the participants, it can be seen how price determines the outcome of their negotiation process, where several of the participants use price as a tool to make a choice between two different food products. This action may be determined by the external structures in which the individual currently finds themselves, such as their living or economic situation. However, the action can also be determined by a motivation to save money due to a desire to use the savings on something they have a desire for. For this reason, it can be argued that the consumer does not achieve the same value or feeling by purchasing a product with a sustainable food label, since from their perception food is simply regarded as something edible, enjoyment or as a necessity. This is even though that several of the participants mention that their awareness of how their purchased food products can have negative consequences for the environment (e.g., buying beef). However, this knowledge does not necessarily discourage consumers in their purchases, as these are more characterised by the routinised behaviour based on the underlying individual drivers and external structures. We therefore see that the participants who use the price as the governing element in their decision-making process are more motivated by the moments of experiences that a saving can bring, since the food product's sustainable manufacturing method does not create the same value as saving money. Therefore, the individual's negotiations process can be argued to be more influenced by their external structures and individual drivers, rather than their individual competences, as the consumer does not consider sustainability when shopping. This consumer's practice can therefore be argued to be represented by Halkier's type *"Ambivalence between routinisation and reflexivity"*, as the reflexive element about sustainability conflicts with their current everyday purchasing practices, cooking skills, and eating habits. These consumers are therefore characterised by not feeling they have the time, energy, or motivation to incorporate the reflexive element into their everyday life, because other factors are more important for them. However, it can also be argued that this group of consumers is also represented by Halkier's *"Routinisation as relief from reflexivity"*, as their shopping habits are characterised by the individual's routines, where they buy what they usually like to consume based on their individual cooking skills within the kitchen. Their routines are therefore not determined by any reflective moment where they think about the environmental consequences their food purchases can have, but are just acting on their everyday routines, where they avoid the reflective element in their groceries.

6. Results from the scenario activity

In the following sections we draw from the findings from the activity where participants discuss the current single-dimensional sustainability food labels, and how they relate different sustainability aspects to them. We additionally draw from the findings of the scenario activity, where products with different food labels were discussed.

6.1. Single-dimensional sustainability labels

During the activities, participants discussed their knowledge and use of the current single-dimensional sustainability food labels and how they perceive and understand them. Most of the participants, who value sustainability, reported to use food labels to guide them in their negotiation process, as highlighted in section 5. However, several of the participants, who do not value sustainability, avoid labelled products, as they experienced that these generally have a higher price. During the discussion, different themes were general between the three workshops.

6.1.1. Recognition and origin of food label influencing usage

All the participants had a high trust in food labels originating from Denmark, where all of them mentioned the Danish organic label as one of the most trusted food labels. This was primarily due to the recognition of the food label, being present on many products within the Danish supermarkets. Labels originating from EU, were also discussed as trustworthy, due to their origin. Almost all the participants were more sceptical when it came to food labels like *Rainforest Alliance* and *Fair-trade*, as these are being controlled by countries outside of EU. *"I think they have the best intentions, those who make this label (Rainforest Alliance). I am just not sure if it really makes a difference"*, indicating that the trust in the labels' function might not have a significant effect on what the label stands for. However, all the participants agreed that products with a food label are better than products without, referring to food labels being trustworthy in general. Another participant mentioned the risk of greenwashing arising from the use of food labels in the food industry, questioning the reliability of the food label *MSC*, due to a documentary about the fishing industry. An awareness about how food labels can be misused as false marketing was therefore present among the participants, but no one mentioned it as a factor that influences their negotiation process.

6.1.2. Non-explanatory design influencing understanding

Many of the participants discussed that the design of the current sustainability labels presented in the workshop, can be difficult to interpret, as these are not observed as self-explanatory. Labels that had no descriptions or symbols that described the sustainability parameter, which is measured, were much harder for them to interpret, e.g., the *European organic* food label: *"We are all in doubt about the green label with the stars. We all know the stars from EU, so it probably has something to do with EU, but we don't know what"*. Bad design and symbols which are not self-explanatory were seen as a constraint for understanding and choosing sustainability food labels.

6.1.3. Navigating the jungle of food labels

Another reoccurring theme, between the participants, was the number of existing labels on the market. This was especially framed, when many different food labels were present on a product: *"There are a lot of labels and things, that I need to remember and take a position on"*, indicating that this can be confusing to navigate. Several of the participants mentioned that this is especially confusing, when products within the same category have different food labels attached. Most of the participants felt confused or overwhelmed with the current single-dimensional food labels on food items, due to these representing different sustainability dimensions, but not being able to compare them with each other. The amount of existing food labels, and the complex task of how to compare them with other products, were seen as constraints for choosing between labelled products.

6.1.4. Lack of information limiting sustainable choices

When discussed how the current food labels can navigate the consumer in taking more sustainable choices, the lack of information on the current food labels were mentioned. Some participants highlighted that when going for organic labelled products, this did not give them the impression of how sustainable the product is: *"[...] there can be an organic label on both an avocado and on beef, but you don't know what the CO₂ emission are"*. Several participants mentioned they wish to know the amount of CO₂ the product is emitting, as this would make it easier for them to choose sustainable products. One participant also highlighted this, when choosing an oat milk compared to a cow milk: *"[...] I assume that it takes less CO₂ to produce, but I don't know what the actual difference is, and how great it is"*.

This was a reoccurring theme between the participants, that none of the current sustainability food labels provides information about the CO₂ emissions, water usage, or biodiversity, and that they felt it was difficult to extract this information, from the current sustainability food labels.

6.2. Multi-dimensional sustainability food label

The new food label *Planet score* was presented to the participants during the scenario activity, where different themes were discussed, which will be unfolded in the following sections.

6.2.1. Multi-level scale as a creator for sufficient knowledge

An aspect that the participants found positive about *Planet score*, was the design of the label. Participants reported that the label is easy to understand based on the overall coloured ranking score, where several mentioned the descriptive text and visuals made the label tangible and manageable: *"This is much more educational and much more manageable"*, and *"Here I have all the information, and I have it on a score and an overall assessment of how good it is"*.

Planet score's design was perceived by the participants as having a very intuitive and self-explanatory design, which is in contrary to how they perceived the design of the current single-dimensional food labels. The overall design with a scale, and

colour ranking, can therefore, potentially provide more understanding and hereby help consumer choose sustainable products, which was identified as a constraint with the current labels in section 6.1.2.

However, a critique of *Planet score*'s overall score was mentioned between the participants, as it raised questions: *"These labels (current food labels) they are very like, 'yes- or no-ish'. [...] But when you get a scale, there you also have to think about ' [...] what does it mean that it is a (category) 'D', and what does it mean to me?"*. The multi-level design of *Planet score* results in more information that the individual must deal with, which is in contradiction to many of the current labels, which are binary. As the new label and the multi-level scale are unfamiliar for the consumers, it can create conflicting response such as distrust and scepticism, as identified as a constraint in section 6.1.1. Yet, this does not mean consumers will write off the food label, but it is recognised that recognition is an important factor.

6.2.2. Subcategories supporting choices

Some differences between the participants who do/do not value sustainability highly while grocery shopping was identified when the subject was focused on *Planet scores* subcategories. Those participants who value sustainability had a higher interest in understanding the labels subcategories, while the other group felt that the subcategories could be overwhelming, facing them with too much information.

Participants with a greater extent of knowledge about sustainability and environmental effects expressed: *"I am very critically"*, and several felt like they initially had more questions than answers when presented with the subcategories. The participants were very interested in understanding how the calculations behind the categories were done. Despite the critical questions, several participants mention that it gives them more nuanced information, than the current food labels: *"[...] so we might not know how they have measured biodiversity, but they have measured it in some way, and that is better than not measuring it at all"*. The participants, who do not value sustainability when grocery shopping, agreed that the subcategories gave them new information of the product that they have not considered before, but not many saw themselves using these when in a negotiation process, as they were concerned with being presented with too much information in a shopping situation.

Even though *Planet score*'s subcategories were received differently, there was an agreement that it provides more nuanced information of the impacts on different measures from food products, which was seen as a deficiency in the current food labels, as described in section 6.1.4. The subcategories provide consumers who are interested in specific categories more information, which can be used as an indicator for choosing according to their individual values or beliefs, which also was identified as a driver for determining their choice of food products in a negotiation process as described in section 5.2.2.

6.2.3. Awareness raising and overview creation

All the participants mentioned how *Planet score* give a better overview of the overall impacts that a food product is causing, compared to the current food labels. Several participants said

that *Planet score* makes it possible to compare products from different food categories, which was identified in section 6.1.3 as a shortcoming of the current food labels: "[...] it is much easier, than looking at five different labels on a product, and then comparing it with five other labels on another product". *Planet score*'s overall score can simplify the process of navigating through the current jungle of food labels, as the individual can more easily assess the difference between the products. The increased possibility to quickly choose among food products, can potentially increase the consumers' ability to make sustainable purchases, without this taking too much time, which was described as influencing the consumers' negotiation process in section 5.2.1.

Participants who do not value sustainability while grocery shopping were generally more surprised about the difference in the overall scoring between the animal-based products and the plant-based products (presented in the scenario). One participant expressed: "I am so happy we don't have it (*Planet score*) here (in Denmark) [...] you become so aware about how bad it actually is (mined beef)". Several said that they have some knowledge about the impacts of food products, but when confronted with *Planet score* the effects were "in your face" and "wow, it is actually, as we all know, really bad for the environment". *Planet score* can educate and increase the level of awareness among consumers, learning and understand how their diet can affect the environment, which was identified as a factor for consumers to plan and choose sustainable products, as described in section 5.1.2.

The participants further discussed, how *Planet score* can function as a reminder and how this can affect their choices: "[...] it might make me feel bad about myself, because I know I have bought something that is bad" and another continues "[...] you are shamed, because it is a bit like 'are you aware that this is the worst thing, that you can do [...]?'". The confrontation that *Planet score* presents for the consumer was a deficiency in the current labels, where consumers did not feel like they could extract this information from these, as described in section 6.1.4. As *Planet score* can create more awareness and educate consumers to understand the consequences of their purchases, this might influence them in their decision-making, or possibly create more reflections, as identified as a factor for making sustainable choices in section 5.1.2.

6.2.4. The modest use of *Planet score*

Most of the participants reported that they could see themselves using *Planet score* as a tool in their negotiation process, when choosing between products, as it gives them a better overview of the overall effects on sustainability parameters. Those who consider sustainability when grocery shopping stated they would use the label as a defining factor for choosing a product with a higher level of sustainability, despite the price being a bit higher. Whereas those who do not value sustainability stated that it would only influence their choices, if it was in a certain price range.

However, all participants said that *Planet score* could not influence their predetermined meal, meaning they would never consider an alternative, if they had decided on a meal: "[...] If

I want falafel for dinner, then I don't care if it is an (category) A or a B, then I want falafel". Meaning, *Planet score* would not affect their choice of product, but they are willing to pick a product with a higher score within the same food category.

Several of the participants explained their attitude towards not choosing plant-based alternatives is due to the difference in taste, where one participant, who have been vegetarian for 40 years, explained: "I also go for plant-based products [...]. However, I do like cow's milk in my coffee. I don't think oat milk tastes as good in coffee". The individuals' preferred taste can be determining for choosing alternative products, even though a strong motivation for choosing plant-based products was present. Another attitude towards not choosing a plant-based alternative is due to lack of knowledge of how to prepare the product, where the protein alternatives 'tofu' and 'veggie meat' would not be selected: "I make my food on the routine [...] so it takes an extra effort to use new products". The participants referred to, that her routines being transitioned from meat-based dishes to plant-based, would take her extra energy and time to change.

6.3. *Planet score* and the negotiation process

The following section will analyse *Planet score*'s potential effect on participants' negotiation process, and if the food label has a potential in influencing the consumer to choose more sustainable products.

6.3.1. *Planet score* influencing consumers choices

Participants, who value sustainability, were first critical when presented with *Planet score*, because it raised a lot of question in them, due to their individual knowledge of sustainability. However, after reflecting upon the label's design and communication style, the participants acknowledge that *Planet score* communicates information, which the current sustainability food labels are not. The participants hereby gained new knowledge from the label, which in return strengthen their individual competences in identifying sustainable food products in the store. This is especially seen as a positive factor for those participants who are characterised by routinisation of reflexivity, as *Planet score* can help ease the reflexive moment while grocery shopping, because the label provides easy and manageable information. The participants highlighted how the *Planet score* can be used as a tool for comparing products in different food categories, where the current labels might be harder in assisting the comparison. *Planet score* can hereby make the negotiation process easier for the consumer, spending less energy on picking groceries. *Planet score*'s subcategories were further recognised as a positive factor, that can assist them in choosing products according to their values and beliefs, during their negotiation-process.

Participants, who do not value sustainability when grocery shopping, expressed that *Planet score* is providing them with more knowledge and increasing their awareness of the effects that their food purchases have on the environment. The participants' expression of how they felt confronted by the food label, shows that *Planet score* increases their awareness. When

comparing the current food labels to *Planet score*, the current labels do not have the same effect on consumers, who do not value sustainability, and that they do not give the same knowledge and awareness as *Planet score*. For consumers who have an ambivalent relationship between routinisation and reflexivity, the current label's conflicting information, can be seen as too difficult to incorporate in their negotiation-process. This is due to it taking more energy and time, which goes against their existing practices. As the *Planet score* is communication clearly and intuitively, through the coloured scale of, it can be argued that it can ease this process for the participants, as they only must relate to one food label, when comparing products. This shows how the *Planet score* can aid the negotiation process, in not only providing knowledge and competences, but can also act as merely a symbol that consumers are navigating according to, without engaging their own competences. In this situation the consumers' individual drivers are, however, still engaged, as they must still negotiate how to weight their values according to the overall scoring, regardless of if their drivers are e.g., price, desire for a meal, health etc.

6.3.2. Incremental changes from *Planet score*

The participants are seen to be affected by the *Planet score* label in different stages of their consumer journey. The participants, who value sustainability when grocery shopping, had different opinions on where in the consumer journey they would be affected by the information from *Planet score*. Several recognised that it would be able to affect them during shopping as a last defining factor, which was also the case for all the participant, who do not consider sustainability when grocery shopping. This indicates that during the shopping phase, the *Planet score*, and the way that it communicates information, can foster incremental changes to consumers' negotiation process, by speaking to their ethics on sustainability, despite their individual drivers being different. However, as seen with the reaction to the *Danish organic* label, by participants who do not value sustainability, where they avoid the product, as they have experience with it being pricier, there is a possibility that this could also be the case with products receiving *Planet scores* of A or B. The difference is however that the alternative products might have a label with a lower overall score of D or E, which these participants have reacted negatively to, as it influences with their conscience.

The incremental impact from *Planet score* might however not only be present during the shopping phase. As the consumers are being confronted with the consequences, their awareness, and knowledge of environmental impacts are slowly being affected. Despite that it might not affect all at the first encounter, there is a possibility, that it can influence their sub-conscience.

A few participants were certain that the phase before and after shopping, is where they can be most affected to change their purchasing choices, incorporating new recipes and getting inspiration to change their meals. This is most prevalent for consumers who value sustainability, as this is coherent with their existing practices of reflecting on their food consumption and how to improve it, at these phases.

7. Discussion

In the following sections we discuss the potential influence of the multi-dimensional sustainability food label *Planet score*, and how it influences consumers' negotiation process, at what rate and if there are other factors which might be more influential in fostering a negotiations process in favour of sustainable consumption.

Through our workshop, constraints for choosing plant-based alternatives were identified, where several of the participants mentioned that these could be tied back to the Danish food culture, which from childhood have given them some ingrown values, meanings, and competences. Studies show that the Danish food culture is characterised by the emphasis on meat, as it is thought of as the important ingredient for warm meals [51], and that a typical Danish meal is defined by a chosen meat, then vegetables and potatoes [52, 53]. Several participants pointed out, they have grown up with eating meat: "*[...] I assume that we all grew up in homes where we had meat for dinner [...] It's like what we are used to*", and another added: "*We are all influenced by how we grew up and by the food we got served, [...] 'this is how a typical meal should be'*". It can be argued that the Danish food culture have an influence on the participants food preferences, their competences in assembling a dish, and how to prepare certain food items. Moreover, several participants point out, that plant-based products are seen to be in their own category, referring to this not be compared to meat products. Some do not feel like trying these products, as they felt like it takes a lot of effort to try out new recipes with an incorporated plant-based product. This was also tied to the expectation of a certain taste, that consumers combine with a certain food product or dish. This expectation might stem from having acquired a certain taste through the Danish food culture, and as one participant, who valued sustainability highly, explained about the oat milk: "*In the beginning I also felt that the taste was weird. Now I think cow's milk is boring [...]*", showing that this can be challenged and changed. The Danish food culture, evolving around meat, is also tied to our identity, and it can define a sense of belonging, both to our family and our ethnic community [54]. Therefore, going against the food culture, can cause a conflict within individuals, because when individuals change their diet, it not only effects themselves, but it also questions their social relations and their identity. When outside factors such as a multi-dimensional sustainability food label is introduced, showing the benefits of choosing plant-based products compared to animal-based products, the discomfort of changing one's diet, and in turn affecting your social relations and identity, can be too great compared to the reward of buying a sustainable product. Therefore, making a more radical change can not only be fostered by the introduction of more comprehensive food label similar to the *Planet score*, but as other measures are also needed throughout the consumer journey [23]. These labels can however act as implements, amongst a multitude of other instruments, to simultaneously change food culture, to allow more radical dietary changes to be accepted.

8. Conclusion

In this study, we examined how the multi-dimensional sustainability food label *Planet score* guides and influences consumers in their negotiation process, and how this compares to the current single-dimensional sustainability food-labels. To study this we first characterised the consumers negotiations process when grocery shopping, considering their consumer journey, and the different modes of routinisation and reflexivity. We examined this from a conceptual framework building on elements both from practice theory and the COM-B model, through the method of workshops where participants were divided into groups according to if they do/not value sustainability when grocery shopping. This was researched in a Danish context of mostly young adults.

The findings show that the negotiation process for choosing products is a complex and dynamic process, which is unique for each consumer. However, it was found that the consumers, who have personal values of considering sustainability when grocery shopping and have a higher level of awareness of impacts from food products, are generally more reflective of their food consumption. Those participants had incorporated new food practices and ways to change their diet because of individual values and beliefs.

The *Planet score* was seen to influence and guide consumers differently according to the characterisation of their negotiations process. However, what is common, is that the label acts as a tool for consumers to assess the overall impacts of food products, and compare between food categories, where most found it easing their negotiation process when comparing products. This was found to be an improvement compared to the existing single-dimensional sustainability labels studied in this research. A consistent finding is also the provision of knowledge due to the subcategories, which educates consumers and has a potential in increasing awareness. What was unique for the group of participants, who do not consider sustainability when grocery shopping, is the confronting feature of the overall score. Due to the design of the label, the information is communicated in a way, that raises the consumers' awareness of the impacts of their food purchases, which was not found to be the case for the current single-dimensional sustainability food labels.

However, most of the influences identified from the findings, indicate that the *Planet score* can make incremental changes to consumers' negotiation process, and consumers are most likely to use it for making incremental changes in their purchases. The stubbornness of factors such as food culture and price are factors which limits the effect of multi-dimensional sustainability labels such as *Planet score*. The findings indicate that to foster radical change the *Planet score* label can act as an implement, amongst a multitude of other instruments, to simultaneously change food culture, to allow more radical dietary changes to be accepted.

The findings from this study adds to the limited body of knowledge of how multi-dimensional sustainability food labels influences and guides consumers. The findings elaborate on the complex negotiations process, and how multi-dimensional sus-

tainability food labels are just one piece of the puzzle. Therefore, we suggest that more research is needed on how other instruments can simultaneously create radical changes to food consumption.

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Appendix A. Extended Introduction and State of the art

Appendix A.1. A broken global food system

The global food system is a web of activities which involves a range of actors with their value-adding in the production, aggregation, processing, transport, consumption, and disposal of food products [1, 55]. The global food system feeds the majority of the world's population and supports the livelihood of over 1 billion people [1]. Agricultural production has rapidly grown since the 1960s where the food supply per capita has increased more than 30%, with a greater use of nitrogen fertilizers (800%) and water resources (over 100%). But even though the population's food supply per capita has increased, it is still estimated that 821 million people are considered undernourished, 151 million children under the age of five are stunted, and 2 billion adults are classified as overweight or obese [1, 56].

The UN Food and Agriculture Organisation (FAO) is estimating a need for producing 50% more food by 2050 because of stressors like population and income growth, and with a higher demand for animal-sourced products [1]. The global food system is today estimated to be responsible for 21-37% of the world's total greenhouse gasses (GHG), which is caused by the agricultural sector. This includes emissions of 9-14% occurring from crop and livestock activities, 5-14% from land use and land-use change, and 5-10% from the supply chain activities [1].

The estimated growth in demand for production of even more food in the future engenders an increase of GHG emissions, more environmental impacts and the loss of biodiversity. These factors underpin the development of a global food system which is a major driver of climate change, environmental degradation and health concerns [1]. To tackle this global problem, IPCC presents a major opportunity for reducing GHG emissions from the food system by changing towards a more healthy and sustainable diet among the world's population. Changing the diet towards a diet which is high in grains, pulses, fruits and vegetables, and low in energy-intensive animal sourced foods can reduce the need for agricultural land compared to present [1]. A consumer chosen dietary change can help achieve a healthier and more sustainable food system³, while also contributing to lower the GHG emissions occurring from the system [55]. A dietary change should be guided by social, cultural, environmental, and traditional factors by e.g. awareness-raising campaigns or 'nudge' strategies, which can potentially change the demand [1, 57].

Appendix A.1.1. Consumer practices and sustainable purchases

Analysing sustainable food consumption through the lens of practice theory is not well researched, despite many authors applying practice theory to general sustainable consumption [32, 33, 34]. However, research shows that it is important to be aware, that consumers' food-related everyday practices contains many automated action patterns, which are culturally embedded and reflected in social institutions and collective action patterns, which consumers rarely questions [35].

Some research has been conducted on how practices influence food consumption. Halkier [36] argue that food consumption is a "[...] complex social phenomenon" [36, p. 12], and that consumers are on one hand conditioned by their practices, while also being able to change. This depends on the social and practical setting which the consumer operate within [36]. Lund [35] and Holm & Kristensen [4] have summarised, in more detail, how food culture influences consumers. They found that 70 % of warm meals, in western countries, have meat as the main ingredient, and that consumers often associate meals without meat, as a meal that doesn't satisfy them [35]. They argue, that food culture revolving around meat has an influence on what is deemed as a good meal. They further argue, that the practical challenges of changing to a more sustainable diet is linked to the interaction between the automatic patterns in our everyday life and the sustainable consumption that the consumer has a desire to implement [35].

How practices within a consumer's grocery shopping is affected, has also been researched. Gram [38] and Holm & Kristensen [4] emphasise the factor of time as having an influence on the consumers' purchases, such as consumers' rhythm of meals during the day. Moreover, their findings show that the time pressure of the rush-hour, has an influence on what consumers purchase and how they shop for groceries [38]. When linking sustainable consumption and everyday practices together, Gram [38] and Holm & Kristensen [4] argue that a products' symbolic consumption is how consumers express their ideologies and feelings when shopping. The symbolic consumption is focused on the consumer's desires and dreams created by moral issues associated with food production, where the consumers' independent agency is where choices can be expressed [38]. They further argue that the supermarket is a stage where consumers can perform and express themselves as they would like to be seen by others [38].

The research on food labels through the lens of practice theory is modest. However, it has been applied by Spaargaren et al. [39] in a study of how Carbon footprint food labels influence consumers' practices. In this experimental case study, carbon footprint food labels were introduced in a lunch canteen, with an aim of lowering the total CO₂ in the canteen. They found that the introduction of the new information acted as a disruption to the participants' shared routines in the canteen. Despite most participants having a wish to partake in lowering the total CO₂, the existing practices turned out to be robust, and the participants were seen to: "[...] defend against what they expect to be 'disruptive' and 'prescriptive' interventions from outside [...]" [39, p.449] The studied case is moderately comparable to a supermarket, as the practices in a canteen can be argued to be more socially anchored and robust

³A sustainable food system is a food system that delivers food security and nutrition for the world's population in an economic, social and environmental way, so that future generations are not compromised [55]

than in a shopping situation. It can further be argued that food labels are normally not present in a canteen, whereas it is common to see in a supermarket and therefore can introductions of new food labels in a supermarket, more easily be adapted by consumers. However, the findings show how the introduction of a new label is conflicting with existing practices. This is also supported by Ali [40], who researched the effect of green marketing (e.g. eco-labelling, green branding and green advertising) on organisations and consumers. He found that consumer tend to not incorporate new information if this has not been practices, and that they rely on existing practices [40].

Brons & Oosterveer [37] have, through the lens of social practice theory, researched students and what has recruited these consumers to adopt practices of buying '*sustainable food*'. The consumers were influenced by; learning's from their parents when growing up where a healthy and high-quality diet was deemed important, through changes in their social environment later in life, and by disruptive factors e.g. moving abroad or having an internship. An important finding and argument from Brons & Oosterveer [37] is also that " *[..] buying sustainable food is connected to numerous other practices in many different ways [..]*" (e.g. shared meanings, bundles of practices with the aim for more sustainability and the competition of time). This supports the complexity of the phenomenon of adopting sustainable food purchases.

These findings show that consumers' various food practices are factors for both more and less sustainable food purchases. The complex web of these practices and how they influence the consumer, gives another perspective of how consumers' food purchases can be changed, and is relevant to consider in the context of multi-dimensional sustainability food labels.

Appendix B. Extended methods

Appendix B.1. Tool for achieving a successful workshop

According to Jensen & Albrechtsen [50] there are five elements that are important to consider when planning a successful workshop:

- Planning
- The participants preconditions and interaction
- Design of activities
- Workshop management and facilitation
- Evaluation and post processing.

These point has been used as reference to insure a successful workshop, both for generating relevant data, and for creating a good experience for the participants.

Appendix B.2. Observations as part of the planning process

To get inspiration for the activities in the workshop, field trips to local supermarkets were conducted, where we observed the layout of the store, the labels on products and our own negotiation process. The aim was to get knowledge of labels and other factors, to broaden our understanding of how other consumers might perceive the negotiation process. As this is a limited view, we also discussed with family and friends their experiences and negotiation processes..

Appendix B.3. Gathering participants

As a tool to get in contact with relevant participants for the workshop, a screening was decided, in the form of an online survey using *SurveyXact*. The Screening contained questions on the participants' background, such as age, gender, educational background, and area of living. The survey also screened the participants for their knowledge on the term *Sustainable food products*, what values they weight as most important when buying groceries, and their familiarity of food labels. Lastly, the survey also questioned how the respondent use the food labels that they are familiar with in a shopping situation. The screening was used to separate respondents into groups: one that values sustainability and considers it when buying groceries, another where respondents do not value sustainability and does not consider it when grocery shopping. The screening was distributed through social media and physical flyers placed around in the city-center of Aalborg with a QR-code printed on physical posters. The flyers were set up at libraries, universities and other social communal places. Additionally, we used our network to find relevant participants outside our personal network.

Appendix B.4. Methods for workshops

As researched by Ørngreen & Levinsen [49], the use of workshops as a research methodology is limited in the scientific field and is still being explored how to design it to achieve the expected outcome. Even though that workshops generate different data compared to other qualitative methods such as observations, interviews or interventions, some similarities can be drawn to focus group interview, when workshops contain a group discussion element [49]. Therefore, we draw on methods from focus group interviews, such as directing the conversation and facilitation [58].

Appendix B.4.1. Workshop management and facilitation

During the workshops, we as researchers accompanied two roles, interchangeably: the facilitator and the manager. The facilitator has the role of guiding the participants through the different activities, keeping track with time, and making sure to ask the right questions. The manager is responsible for taking notes during the activities, recording the discussions, and prompting relevant follow-up questions if necessary.

We aimed at giving the participants clear instruction on the activities, and guided them with open ended questions, to not steer their answers in a clear direction. By asking questions to both individuals and the whole group, we made sure that all participants were heard and had a chance to speak. The aim is to create a dialogue between the participants, and to let them inspire each other. However, we took the opportunity to intervene if one participant was not speaking, or if the discussion was not evolving in the right direction.

Appendix B.5. Post processing

A follow-up survey was designed, to both evaluate how participants experienced the process of the workshop, but also to gather reflections that the participant potentially could have had after the workshop ended.

The recorded audio files of the workshops were transcribed using the online service *GoodTape*, that automatically transcribes the files [59]. All files were then looked through and corrected if mistakes were found. The relevant quotes, incorporated in the article, were then translated from Danish to English.

Appendix C. Workshop Images



Individual writing activity



Activity on sustainability dimensions



Scenario activity

Appendix D. Workshop guide

	Questions	Comments (Artifacts/activities)	Time
Introduction	<ul style="list-style-type: none"> • Presentation <ul style="list-style-type: none"> ○ Master students of Aalborg University - preparing our final thesis about the Dane's grocery shopping behaviour and how these can get affected by different factors. Further, we are researching how the Danish consumers are using food-labels and how these are helping to make more sustainable choices. • Scope of the workshop <ul style="list-style-type: none"> ○ Time: 2 hours ○ Workshop contains three parts with a 5 minute break in between. ○ First part is about the consumer's journey (before, during, and after grocery shopping). ○ The second part had the purpose of understanding the consumer's view of sustainability in a purchasing situation and how sustainability labels (single) effects and motivates their shopping behaviour. ○ The third part had the overall purpose of discussing how multi-dimensional food labels would have an effect on the consumer's shopping behaviour, while identifying issues and possible solutions for making it easier for the consumer to make every day sustainable choices. • Practical info <ul style="list-style-type: none"> ○ We would like to record the process along the way and therefore have a microphone in the room ○ We will use quotes from you along the way, which will become part of our analysis ○ You will appear anonymous ○ We have no expectations of your answers and the whole point of the workshop is not that there are right or wrong answers 	Powerpoint presentation	10 min
Part 1	Introduction to activity: <ul style="list-style-type: none"> • Explanation and purpose of the activity - mapping the consumer's consumer journey <ul style="list-style-type: none"> ○ Explain the last time you did grocery shopping ○ Do you do it in a certain way? • Hand out paper (divided into three sections: before, during and after) • Reflect upon the different sections <ul style="list-style-type: none"> ○ 5 min individual writing ○ Afterwards all share their thoughts with each other • Mapping the reflection on post-its (the manager) 	Powerpoint presentation	5 min
	Individual writing: <ul style="list-style-type: none"> • Intro to planning phase <ul style="list-style-type: none"> ○ Use 5 minutes to describe which thoughts you have when and how you are planning your groceries before going grocery shopping 	Individual writing/drawing or using post-it to map their consumer journey Using an A4 paper divided into: before (planning), during	15 min

	<ul style="list-style-type: none"> ■ <i>How do you plan your groceries?</i> ■ <i>Which factors are important for you when you are planning?</i> ○ <i>Participants can take inspiration in pictures and cue-cards placed on the table</i> <ul style="list-style-type: none"> ● <i>5 minutes individual writing</i> <ul style="list-style-type: none"> ● Intro to the shopping phase <ul style="list-style-type: none"> ○ <i>Use 5 minutes to describe which thoughts you have when you are choosing one product from another when you are grocery shopping</i> <ul style="list-style-type: none"> ■ <i>How do you choose between the different food products when you are in the store?</i> ■ <i>Do you use the information which the store gives you, when choosing between food products?</i> <ul style="list-style-type: none"> ● <i>5 minutes individual writing</i> <ul style="list-style-type: none"> ● Intro to after the shopping phase (reflections) <ul style="list-style-type: none"> ○ <i>Use 5 minutes to describe which thoughts you have when you are unpacking your groceries or use the products while cooking</i> <ul style="list-style-type: none"> ■ <i>Do you read the information on the products after grocery shopping?</i> ■ ○ <i>How do you choose between the different food products when you are in the store?</i> <ul style="list-style-type: none"> ■ <i>Do you use the information which the store gives you, when choosing between food products?</i> ■ <i>Do you see a difference between the reflections you have in the supermarket vs. when you unpack the food or are cooking?</i> <ul style="list-style-type: none"> ● <i>5 minutes individual writing</i> 	<p><i>(shopping) and after (reflective until next time). Cue cards and pictures on the table will help inspire them</i></p> <p><i>The workshop hosts are guiding / helping / inspiring during the session</i></p> <p><i>Cue-card examples:</i></p> <ul style="list-style-type: none"> ● <i>Shopping list</i> ● <i>Discount advertising newspapers</i> ● <i>Plastic waste</i> ● <i>Queues in supermarket</i> ● <i>Food-labels</i> ● <i>Routines</i> ● <i>Discount labels</i> ● <i>Habits</i> ● <i>Cooking skills</i> ● <i>Pleasure</i> ● <i>etc.</i> 	
	<p>Sharing thoughts and reflections: (Mapping)</p> <ul style="list-style-type: none"> ● <i>Relate their thoughts to before, during and after shopping (consumer journey)</i> ● <i>One person starts by presenting their journey, the manager help write it down on post-it to fill out the journey</i> ● <i>Another goes on and together we fill out the board</i> ● <i>The facilitator uses the guiding questions to make the participants talk about relevant subjects</i> <p>Guiding questions:</p> <p><u>Before (planning):</u></p> <ul style="list-style-type: none"> ● <i>Do you plan your groceries in advance? - why do you plan? why not? (Individual drivers, individual competences, external structures)</i> <ul style="list-style-type: none"> ○ <i>How do you plan it? (cues)</i> <ul style="list-style-type: none"> ■ <i>Grocery list or technology</i> ■ <i>Desires for a certain meal</i> ■ <i>Weekly meal plan</i> ■ <i>Looking for special offers</i> ■ <i>Get inspired by social media</i> ■ <i>Looking in cooking books</i> ■ <i>Thinking about what others in the household</i> 	<p><i>Using post-its (color: yellow) to map their consumer journey on the board</i></p>	<p><i>15 min</i></p>

	<p>wants/likes</p> <ul style="list-style-type: none"> ■ Inspired by others e.g. coworkers lunch, friend suggested a meal etc. <p>○ If not: (cues)</p> <ul style="list-style-type: none"> ■ Spontaneous shopping ■ Get inspired in the store ■ Looking for special offers ■ Buys whatever you feel like <ul style="list-style-type: none"> ● What is important when you plan? (<i>Individual drivers</i>) <ul style="list-style-type: none"> ○ Health, discount, price, quality or branding ● How do you put together your meals? (<i>Individual competences, individual drivers, external structures</i>) <ul style="list-style-type: none"> ○ Craving a particular flavor or meal ○ Inspiration from social media ○ Inspiration from cookbooks ○ Inspired by others eg. colleagues lunch or a meal suggested by a friend ○ Adaptation to what others in the household prefer ○ Infor campaigns (dietary advice etc. <p><u>During (shopping):</u></p> <ul style="list-style-type: none"> ● What motivates you to choose between one food product and another? (<i>Individual drivers, individual competences, external structures</i>) <ul style="list-style-type: none"> ○ Habits, price, impulse, brands, time availability, locally produced, quality, convenience, relationships ● Are you sometimes in a negotiation with yourself when choosing between one product and another? <ul style="list-style-type: none"> ○ Why? ● Do you use in-store information when choosing food items during your shopping? How do you use the information? (<i>Individual competences, external structures</i>) <ul style="list-style-type: none"> ○ Information on product <ul style="list-style-type: none"> ■ Labels, nutritions, allergies etc. ○ Inspiration in store <ul style="list-style-type: none"> ■ Pictures, branding etc. ■ Cooking recipes ■ What catches your eye and makes you react? ■ Info campaigns ● Do you enjoy grocery shopping? Why/why not? (<i>Individual drivers, external structures</i>) <ul style="list-style-type: none"> ○ Time, people, kids, social factors, stress etc. <p><u>After (reflections until next shopping trip):</u></p> <ul style="list-style-type: none"> ● Do you read the information on the products after the shopping? (<i>individual drivers, individual competences, external structures</i>) <ul style="list-style-type: none"> ○ Nutritions, food-labels, recipes, reduced packaging, climate claims ● Can you see a difference between the reflections you have in the supermarket vs. when you unpack your groceries or when cooking? (<i>External structures</i>) <ul style="list-style-type: none"> ○ Where do you have the most time to read the information on the products? ● Did you see something in the store that inspired you for your next shopping trip? (<i>external structures, individual drivers</i>) <ul style="list-style-type: none"> ○ A certain product, new product that have been launched, a climate-friendly alternative eg. plant-based ● Do these reflections affect your next shopping trip? (<i>Individual drivers, individual competences</i>) 		
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<p style="text-align: center;">Break</p> <p style="text-align: center;">Put away cue-cards and place new ones on the table</p>			5 min
Part 2	<p>Introduction to activity:</p> <ul style="list-style-type: none"> • Within part number two, sustainability is introduced, where we want to know how the Danish consumer makes use of food-labels in their daily purchasing situations. • New post-its will be used <ul style="list-style-type: none"> ◦ Blue illustrates where in the consumption process the consumer finds it easier to integrate sustainability into their everyday life and thus have a positive effect on their purchases. ◦ Pink illustrates where in the consumption process the consumer finds it difficult to integrate sustainability into their everyday life and thus have a negative / no effect on their purchases. • New cue cards get placed on the table 	<p>Using post-its (color: blue and pink) to map positive and negative effects of sustainability when grocery shopping on the board</p>	5 min
	<p>Food-labels gets introduced:</p> <ul style="list-style-type: none"> • Which aspects of sustainability do you think are represented by these brands? (<i>Individual competences</i>) <ul style="list-style-type: none"> ◦ Which ones do you think are not represented? • Do you use the current brands in the supermarket to find sustainable products? (<i>Individual drivers</i>) <ul style="list-style-type: none"> ◦ Why do you pay particular attention to these? • How do the food-labels help guide you to make a sustainable choice? (<i>External structures</i>) <ul style="list-style-type: none"> ◦ Content of information, detail degree, design, visibility of brands, recognizability • What aspects of the food-labels are not optimal for guiding you? (<i>External structures, individual competences, individual drivers</i>) <ul style="list-style-type: none"> ◦ Unclear what the label is representing ◦ Level of detail - too high / low ◦ Words I don't understand ◦ Lack of labels ◦ No comparability 	<p>Cue cards and food-labels on the table will help inspire them</p> <p>The workshop hosts are guiding / helping / inspiring during the session</p> <p>Food-labels introduced:</p> <ul style="list-style-type: none"> • Fair-trade • Ecology (Danish brand) • Ecology (European) • Rainforest alliance • Vegan • Better animal welfare • MSC (certified sustainable seafood) <p>Cue-card examples:</p> <ul style="list-style-type: none"> • Sustainable development • Good living and working conditions • Animal welfare • Low in CO2 • Gentle on natural resources • Non GMO • etc. 	10 min
	<p>Reflection of which role food-labels play in a negotiation process: (with a focus on sustainability and a scenario)</p> <ul style="list-style-type: none"> • Introduction to scenario: <ul style="list-style-type: none"> ◦ Food products are placed on the table ◦ Introduce the products • Which differences do you see on the different products on the table? (<i>Individual competences</i>) <ul style="list-style-type: none"> ◦ Ecological, conventional, animal welfare, plant-based etc. • If you were to buy one of these products, how would you choose? (<i>Individual drivers</i>) <ul style="list-style-type: none"> ◦ Please put your thoughts into words • What considerations do you go through when you shoes one 	<p>Artefacts gets placed on the table:</p> <ul style="list-style-type: none"> • Convenience milk • Ecological milk • Plant-based milk (oat milk) • Convenience minced beef • Ecological minced beef • Plan-based minced pea protein • Tofu 	20 min

	<p>product from another? (<i>Individual drivers, individual competences, external structures</i>)</p> <ul style="list-style-type: none"> ○ Price, health, quality, branding, food-labels, packing etc. ○ What information on the packages do you notice ○ How do you weigh this information against each other <ul style="list-style-type: none"> ● Do you use the food-labels to make a decision? How and why? (<i>Individual drivers, individual competences</i>) <ul style="list-style-type: none"> ○ How do you weigh the various elements of sustainability in your decision ● Are there other elements of sustainability that you would like information about? Eg. through food-labels (<i>individual drivers</i>) <ul style="list-style-type: none"> ○ How would that affect your decision? ● Do you see other problems that can prevent you from making sustainable choices? (<i>External structures</i>) <ul style="list-style-type: none"> ○ Price ○ Busyness in everyday life ○ Many people in the supermarket ○ Children in the supermarket ○ Need to reach something after shopping ○ Ingenuity ○ Cooking skills ○ Others in the household's opinion about purchases ● Is your shopping limited by your knowledge or cooking skills? (<i>Individual competences, external structures</i>) ● Do you care about what others think when they look down into your cart (sustainable products)? (<i>individual drivers</i>) <ul style="list-style-type: none"> ○ Do your decisions get influenced by other people? ○ Do your shopping get influenced by what you read/hear? ○ Do your decisions get influenced by campaigns? 	<p>Price is present on the food-products besides the food-labels the manufacturer have put on the product.</p>	
<p style="text-align: center;">Break</p> <p style="text-align: center;">Remove food-labels and cue-cards</p> <p style="text-align: center;">Add planet-score to the products</p>			10 min
Part 3	<p>Introduction to activity:</p> <ul style="list-style-type: none"> ● In this activity, we focus on the sustainability food-label 'Planet score' ● Here we would like to discuss how this can be used compared to the current food-labels, and whether this can affect the purchasing situation ● Finally, we would like to discuss whether there can be any improvements to the food-label or whether other measures are more useful. <p>Introduction of Planet-score:</p> <ul style="list-style-type: none"> ● This food-label is designed to show multiple aspects of sustainability to the consumer, compared to current single food-labels that only show one aspect. ● The meaning of the sustainability food-label is that it should be able to give the consumer a better overview of the product's overall impacts. ● This would present as an additional food-label 	<p>Using post-its (colour: green) to map possible solutions to enhance the availability to choose more sustainable-friendly products on the board</p>	5 min
	<p>Reflect on the sustainability food-labels and how they can be used compared to single food-labels:</p> <ul style="list-style-type: none"> ● When you look at the Planet-score, how do you perceive this in relation to Single food-labels that we talked about in part 2? (<i>Individual drivers, Individual competences, external structures</i>) <ul style="list-style-type: none"> ○ Elaborate on the difference ● Does this give you a better overview of several sustainability aspects? (<i>Individual competences, external structures</i>) <ul style="list-style-type: none"> ○ How? 	<p>Planet-score have been printed with different scores and placed on the products on the table</p> <p>Coop Sustainability declaration will be introduced if participants are interested in more information on the products</p>	10 min

	<ul style="list-style-type: none"> Do you think that seeing this label would make it easier for you to make a sustainable decision in your purchases? (Individual drivers) <ul style="list-style-type: none"> How? In what areas can they not? Can you imagine using them to navigate when shopping? (individual drivers) <ul style="list-style-type: none"> Why/why not? What problems do you see with the sustainability label? (Individual drivers, individual competences, external structures) <ul style="list-style-type: none"> Too detailed, or should it contain more information? Too hard to choose with so much information Difficult to go for multi-dimensional food-label products compared to single-dimensional food-labels? Is there anything about the design that needs improvement? More clearly what the food-label covers? Is more general information needed (just a score to make it easier for consumers to decide?) Would the planet-score be able to replace the current food-labels such as organic, animal welfare etc. and would this still guide you adequately? (Individual drivers, individual competences) <ul style="list-style-type: none"> Why/why not? If interested: COOP sustainability declaration (individual drivers, individual competences, external structures) <ul style="list-style-type: none"> Based on COOP's sustainability label, how does it differ from single brands? Does this give you a better overview of all / more sustainability aspects? Does this show information about the sustainability topics that interest you? Do you think that seeing this label would make it easier for you to make a sustainable decision in your purchases? How? 		
	<p>Finding solutions:</p> <ul style="list-style-type: none"> We will now use the previous points from the red post-its about the problems, as well as the positive points from the blue post-its, to develop improvements and solutions. This covers both how future sustainability food-labels can be improved, as well as how other methods can help guide consumers to make some sustainable choices in their daily purchases. <p>Based on the identified problems from the previous round:</p> <ul style="list-style-type: none"> Why do we opt out of sustainable products (pink post-its) Why food-labels do not guide the consumer properly (pink post-its) <p>Solutions to these problems:</p> <ul style="list-style-type: none"> What information or method would make it easier for you to choose a more sustainable product? (Individual drivers, individual competences, external structures) <ul style="list-style-type: none"> Why? Can you come up with any concrete solutions or have you experienced initiatives that have influenced you positively in relation to sustainable purchasing? (Individual drivers, individual competences) <ul style="list-style-type: none"> Why? Are there places in the consumer journey where other methods than food-labels, that help guide you to choose sustainable products? (Individual drivers, individual competences, external structures) <ul style="list-style-type: none"> Info campaigns Self-acquired knowledge about sustainability TV programs Social Media 	Discussion between the participants	10 min

	<ul style="list-style-type: none"> ○ <i>Information in the supermarket</i> ● <i>Where in the consumer journey are you most susceptible to being influenced to change your habits? (Individual drivers, individual competences, external structures)</i> <ul style="list-style-type: none"> ○ <i>Why?</i> ● <i>How does independent climate marketing (branding on the packaging) affect your purchases? (Individual drivers, individual competences, external structures)</i> <ul style="list-style-type: none"> ○ <i>Reduced packaging</i> ○ <i>CO2 neutrality</i> ○ <i>Climate compensated</i> ○ <i>Reduced climate footprint</i> ○ <i>100% plant-based</i> ○ <i>Low climate footprint</i> ● <i>How do these differ from the official brands? (Individual drivers, individual competences)</i> <ul style="list-style-type: none"> ○ <i>Are these easier to understand?</i> ○ <i>Is the information clearer?</i> ○ <i>Do you feel it is easier to make a sustainability decision when you see these climate marketing measures?</i> ○ <i>Do you see any connections between these official brands and the sustainability food-labels that we presented?</i> <ul style="list-style-type: none"> ■ <i>Easier to understand</i> ■ <i>Similarity?</i> 		
Last comments	<p>Thank you for your participation and inputs</p> <ul style="list-style-type: none"> ● Did you learn something new about your shopping habits and others? <ul style="list-style-type: none"> ○ Do you think you will reflect upon something you learned from today next time you go grocery shopping? ● Any last comments? 		

○