Perceptions of eco-labelling within the Swedish food sector

A Q-study to identify challenges and incentives among food processors, retailers, and label organisations

Lina Larsson

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Uppfattningar om miljömärkningar inom den svenska livsmedelssektorn
En Q-studie för att identifiera utmaningar och möjligheter hos förädlare, dagligvaruhandel och miljömärkningar

Lina Larsson

Abstract

Eco-labelling is a promising approach to promote sustainable consumption. Despite a growing concern for the environmental consequences of food production, the use of eco-labels has remained low. To date, a large body of literature has focused on consumer perspectives of eco-labelling, while research on the food industry's perspective has remained scarce. This study starts to address this gap by analysing the diverse perceptions of eco-labelling among Swedish processors, retailers, and label organisations. The aim of this study is to identify the most critical challenges of eco-labelling and to understand in what form eco-labels can set incentives for the provision of ecosystem services within the agri-food production.

Q-methodology was used to reveal patterns of shared-meaning among ten participants within the Swedish food sector. The findings revealed three perceptions of eco-labelling: label optimists, true conservatives, and label sceptics. The main challenges of eco-labelling were related to consumers understanding and comprehension of labels' meanings, information on products' environmental impacts, and the increasing number of eco-labels on the market. The findings further revealed several suggestions for how eco-labels can increase incentives for ecosystem services. These include transparency, product-related information, and promotion of local ecosystem services.

Keywords: eco-label, sustainable consumption, green purchase intention, informed purchase decision, ecosystem services, Q-methodology.

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Abbreviations

SLU	Swedish University of Agricultural Sciences
ZALF	Leibniz-Centre for Agricultural Landscape Research
ES	Ecosystem services

1. Introduction

This introductory chapter presents the background and problem formulation of the study. Furthermore, the study's aim and research questions are defined, followed by an overview of the study's outline.

1.1 Background

Food production is a major driver of global environmental change, threatening several ecosystems by contributing to biodiversity loss, freshwater use, land system change, and interference with nitrogen and phosphorus cycles (Röös, et al., 2020; Willett, et al., 2019). Recent research indicates that the environmental impact caused by the average Swedish diet exceeds the global boundaries for cropland use and nutrient application by two- to more than four-fold and surpasses the boundaries for biodiversity by six-fold (Röös, et al., 2020). To reduce the environmental burden from the food system, a shift towards more sustainable consumption patterns and significant improvements in food production is required (Iraldo, et al., 2020; Nguyena & Le, 2020; Röös, et al., 2020; Taufique, et al., 2019; Willett, et al., 2019).

Growing concern about environmental issues has led many consumers to rethink the way they consume and how companies should produce their products (Schmidt, et al., 2017). One strategy being increasingly used to bridge the environmental concern and companies' interest is the use of "green" label standards, also known as eco-labels (Ihemezie, 2018). Eco-labels are voluntary environmental performance certifications (Taufique, et al., 2019) with a means to "identify products' environmental characteristics within a specific product category" (Global Eco-Labelling Network, 2014). Eco-labelling schemes, such as EU-Organic, KRAV, and Svenskt Sigill, aim to provide consumers with environmentally related, product specific information (Taufique, et al., 2013). They enable producers to promote the green credentials of their products and ultimately influence consumers towards eco-friendly consumption and improve the environmental performance of food production (Iraldo, et al., 2020; Ihemezie, 2018).

Although consumers are becoming increasingly aware of environmental issues (Chen, et al., 2018; Leach, et al., 2016) and many consumers claim to be willing to pay for sustainably produced products the share of eco-friendly food of the total consumption has remained low (Ihemezie, 2018; WWF, 2020). According to a consumer survey, conducted on behalf of Orkla 2020, every second Swede, 49 percent, attempts to buy food with a low environmental footprint (Larsson, 2020). Yet, only about 11 percent of the food being purchased in Sweden constitutes a certified eco-label (WWF, 2020).

Literature suggests that the poor consumer acceptance of eco-labels may result from a perceived high purchase price, insufficient availability (Mäkiniemi & Vainio, 2014), poor label design, and lack of knowledge of the label content (Ihemezie, 2018; Mäkiniemi & Vainio, 2014). Even though compliance with eco-label standards is often verified by an independent third-party, consumer studies imply that eco-labels are often misunderstood (Mäkiniemi & Vainio, 2014) and perceived as deceptive, unreliable, or simply not trustworthy (Thøgersen, et al., 2010; Janssen & Hamm, 2014). Furthermore, research suggests that the increasing number of inconsistent eco-labels on the market cause consumer confusion, mistrust, and scepticism (Banerjee & Solomon, 2003; Delmas & Lessem, 2017).

As the consumers are the ultimate actors of eco-friendly consumption (Taufique, et al., 2013), the complexity surrounding consumers' assessment of eco-labelling is a critical issue (Taufique, et al., 2019). Challenges such as creating consumer recognition, credibility and demand might hinder eco-labelling from working effectively, hence impeding the goal of reducing the negative environmental impact of food production and consumption (*ibid*).

1.2   Problem statement

While previous studies have largely focused on consumer behaviour and different dimensions of consumers' understanding of label attributes (Ihemezie, 2018; Taufique, et al., 2019) there has been limited research evaluating eco-labels from the food industry's perspective. Investigating the diverse perceptions of Swedish food processors, retailers, and label organisations -the actors designing, implementing, and promoting labelling standards- can help address the most concerning issues of eco-labelling. Moreover, the findings might help identify the factors or reasons behind the slow acceptance of eco-labels by Swedish consumers. Revealing these viewpoints can provide useful insights on how to communicate, design, and implement successful eco-labels and further enhance our understanding of how eco-labelling can better increase sustainable consumption and production.

1.3 Aim and research questions

The aim of this study is to analyse the Swedish food sector's perspective on eco-labelling for the effective and efficient provision of ecosystem services within the agri-food production. The study attempts to identify what main challenges are associated with eco-labelling, and further contribute to our understanding of in what form eco-labelling can set incentives for ES provision.

The study focuses on two questions:
- What is perceived as the most critical challenges of eco-labelling among Swedish food processors, retailers, and label organisations?
- What is perceived as essential label elements to set incentives for ES provision?

1.4 Outline

The study is structured as follows: First, the introductory chapter provides some general background of eco-labelling and defines the study's aim and research questions. After that, the literature review presents a definition of eco-labelling and its overall objectives. It further examines the present state of the literature on the topic in order to explore the perceived challenges hindering eco-labelling from working effectively. Chapter three describes the method used for the study. This is followed by an analysis and discussion of the study results. Finally, the conclusion addresses the study's theoretical and managerial implications, and directions for further research.

2. Literature review

This chapter defines eco-labelling and describes the general aim and purpose of labelling schemes. Furthermore, the chapter provides a comprehensive overview of the current literature on the topic to highlight what is considered as potential challenges hindering eco-labels from working effectively.

2.1 The general aim of eco-labelling

Eco-labelling is a promotional tool meant to reduce information asymmetries between producers and consumers by providing consumers with otherwise undetected information about a product's environmental characteristics (Delmas & Lessem, 2017; Nadara & Ertürk, 2021). By reducing such an information gap, labelling schemes aim to provide consumers with credible information about a product's environmental performance and benefits, increase consumer's environmental awareness, help consumers make informed decisions, and thus, promote sustainable food consumption (Ihemezie, 2018; Iraldo, et al., 2020; Thøgersen, et al., 2010).

From the businesses' point of view, eco-labelling has become a marketing tool to promote environmental performance, legitimize business activities, protect from public regulation (Gulbrandsen, 2006), and help gain competitive advantages by attracting customers through product differentiation and product value creation (Delmas & Lessem, 2017; Nguyena & Le, 2020; Taufique, et al., 2013).

Products might be labelled based on a wide range of environmental considerations and differ in content, precision, and reliability (Grover & Bansal, 2019). The label can be granted on a single attribute (e.g., carbon footprint) or on an overall product assessment (organic production) (Iraldo, et al., 2020). However, all eco-labelling schemes are voluntary (Nadara & Ertürk, 2021) and inspired by regulatory principles and application methods (Iraldo, et al., 2020). They are based on the logic that "products that meet certain environmental criteria can be granted a label that indicates their better environmental performance compared with other products in the same category" (Iraldo, et al., 2020:834).

Eco-labels can primarily be classified into two types: informative environmental self-declaration claims, also referred to as first-party claims, and independent third-party claims. As the name suggests, the former label is placed on a product by the producer, marketer, or retailer. Independent third-party labelling, on the other hand, is based on compliance with specific environmental criteria, which are verified by an independent third-party certification body (Taufique, et al., 2013).

2.2 Challenges of eco-labelling

Eco-labelling is a promising approach for facilitating sustainable consumption. It is evident from the literature that eco-label standards positively impact consumers' purchasing behaviour and improve the environmental performance of food products. However, the influence of labels highly depends on how well consumers recognize and understand the label's meaning (Banerjee & Solomon, 2003), trust the information presented (Janssen & Hamm, 2014), and how well the information aligns with the consumers' own values and characteristics (Nguyena & Le, 2020). In other words, some critical challenges need to be overcome in order for eco-labels to be effective and efficient (Iraldo, et al., 2020).

2.2.1 Provision of adequate information

To make ecologically responsible food choices, consumers need relevant product information (Taufique, et al., 2017). The information should make logical sense, be reliable and easily comprehensible to allow consumers to differentiate between product environmental impacts and discriminate between trade-offs such as market price (Thibert & Badami, 2011). Accessible information influences eco-friendly behaviour as consumers who are better informed about an eco-label's environmental attributes better understand its message and appreciate the value of the underlying attribute (Delmas & Lessem, 2017; Vlaeminck, et al., 2014). However, existing eco-labels often fail in providing such adequate information (Goossens, et al., 2017; van Amstel, et al., 2008).

Because a vast majority of labels are unclear about the standardization of their claims, consumers are unable to evaluate the label's environmental themes. Language such as "sustainable" and "environmentally friendly" is seen as too vague about specifying the meaning of a label and can, on the contrary, be misleading (van Amstel, et al., 2008). A harmonization of terminology and eco-label standards is hence indispensable to enable consumers to differentiate between products and make adequate decisions (Goossens, et al., 2017; Iraldo, et al., 2020; Taufique, et al., 2019).

Eco-labels often fail to consolidate the overall environmental impact of a given food choice (Goossens, et al., 2017; Thibert & Badami, 2011). Current labels tend to cover the planning and implementation stage of food production but rarely include the output stage. The ecological impact is not measured and can thus not be communicated to consumers (Goossens, et al., 2017; van Amstel, et al., 2008). Environmental impact food labels (such as traffic-light systems, star ratings, and % daily calculation) are desirable, as they provide easily accessible information and allow consumers to compare across and within food product types (Leach, et al., 2016; Vlaeminck, et al., 2014). However, there are considerable difficulties in estimating, integrating, and communicating such impacts (Goossens, et al., 2017; Thibert & Badami, 2011). For example, one product may appear more favourable in terms of one footprint but less sustainable in terms of another (Leach, et al., 2016). Thus, to avoid trade-offs between footprints, an integrated and comprehensive label, reflecting a wide range of impact categories and covering the full supply chain, would be more valuable for making informed decisions (Goossens, et al., 2017; Miranda-Ackerman & Azzaro-Pantel, 2017). Such an approach, however, is costly and requires consistency to be effective (Goossens, et al., 2017; Thibert & Badami, 2011). The number of ingredients and complexity of the product method further constrains the footprint determination (Leach, et al., 2016; Thibert & Badami, 2011).

The label design in terms of readability and uniformity is another issue. While a detailed label may provide essential product information, the space on the product package is limited (Leach, et al., 2016). Moreover, studies imply that average consumers are unable to understand the technical information behind a more complex label and are unwilling to spend time doing so (Banerjee & Solomon, 2003). Accordingly, Delmas and Lessem (2017) suggest that consumers prefer eco-labels with messages that are "simple, easy to understand and relate the product to their core values" (Delmas & Lessem, 2017:30).

Amstel et al. (2008) suggest that government regulation of the almost entirely private-sector branch could lead to a harmonization of the market. Governmental requirements for clear and specific terminology of eco-label themes, in combination with information of standardization processes and inclusion of output stages of the food production would make the market more transparent and reliable. A successful example is the EU who has formulated minimum standards for organic production. These standards have made organic products "more readily distinguishable from other declarations of environmental friendliness" (van Amstel, et al., 2008:274).

2.2.2 Information overload

Although eco-labels aim to help consumers make informed decisions, excessive labelling and information overload might have the opposite effect (Delmas & Lessem, 2017; Taufique, et al., 2017). Research findings imply that the presence of competing labels on the same market, as well as the existence of uncertified labels on the market, cause consumer confusion over which one to trust (Taufique, et al., 2017). Uncertainty over eco-labels' goals, credibility, and expected benefits leads to mistrust and further acts as a barrier for making responsible choices (Banerjee & Solomon, 2003; Verbeke, 2005). How a large number of competing labels affects the market as a whole is uncertain, and research findings differ (Delmas & Lessem, 2017; Janssen & Hamm, 2014). While some literature indicates an overall negative impact, others find a large number of labels to be justified as different consumer segments have different label preferences (Janssen & Hamm, 2014; Verbeke, 2005). Janssen and Hamm (2014) states that "consumers are not likely to be confused by a variety of labels as long as the labels are well promoted and targeted at different consumer segments" (Janssen & Hamm, 2014:446). However, it is likely to believe that fewer and more reliable eco-labels would make the market more transparent and hence allow consumers to evaluate and reward the labelled products on informed choices (van Amstel, et al., 2008).

2.2.3 Consumer awareness and understanding

Research shows that consumer awareness and understanding plays a significant role in eco-labels' success (Chen, et al., 2018; Liu, et al., 2017; Taufique, et al., 2017). Knowledge about the environment in general and the specifics of eco-labels is positively associated with attitudes towards the environment and green purchase intentions (Banerjee & Solomon, 2003; Liu, et al., 2017; Thøgersen, et al., 2010). Education for consumers about environmental impacts, to improve their awareness of sustainable production, is therefore believed to translate into greater support for eco-labelled products (Chen, et al., 2018).

Eco-labels are one of the important ways to educate the consumers about environmentally friendly products (Taufique, et al., 2013). However, for the label to be workable the signals sent by the label needs to be recognized and understood. That is, consumers must be able to interpret the connection between the environmental issue, the label's meaning, and the actions needed to reach results (Banerjee & Solomon, 2003).

Furthermore, companies labelling their products plays an essential role in increasing consumer awareness. Banerjee and Solomon (2003) suggest that advertising about label attributes should be prioritized. The advertising should be designed to be both appealing and understandable and cover as many kinds of media

as possible. Because partnerships increase both recognition and credibility (such as from positive feedback) (Taufique, et al., 2017) efforts should be made to increase the number of partnerships, covering as many stakeholder groups as possible, including governments, NGOs, private businesses, universities, and schools (Banerjee & Solomon, 2003).

Although consumer knowledge is positively related to purchase intentions, studies have also found that knowledge might have a direct negative impact when consumers do not trust the information provided (Taufique, et al., 2017).

2.2.4 Consumer trust

Consumers' assessment and acceptability of eco-labels highly depends on whether they trust the information provided (Janssen & Hamm, 2014; Taufique, et al., 2017). Because environmental qualities (such as organic and pesticide-free) have high credence value, consumers have difficulty ascertaining such claims by physical attributes (Grover & Bansal, 2019). Hence, their trust in the labelling source and trust in the firm's environmental commitment becomes essential (Taufique, et al., 2019).

Several studies have found that consumers are having difficulties in understanding what eco-labels are aimed to communicate (Thøgersen, et al., 2010; Taufique, et al., 2019). When consumers have poor knowledge of the differences between various labels, firms have an incentive to engage in opportunistic behaviour, e.g., by using their own supposed eco-labels or applying labels similar to excising third part eco-labels (Delmas & Lessem, 2017). Greenwashing is an act of misleading consumers in regard to environmental performance. Because consumer confusion leads to mistrust (Thøgersen, et al., 2010), labels that do not deliver on their promises can profoundly damage consumers' confidence in green products and risk to undermine eco-labels as a whole (Taufique, et al., 2019).

However, when consumers understand the labels meaning (Delmas & Lessem, 2017) and trust the credibility and scientific rigour of the claims, their reliance on it increases (Ihemezie, 2018). To reassure consumer confidence, literature suggest that eco-label information should relate to the product's environmental attributes and signal the product's superior environmental performance (Testa, et al., 2013). Third-party certifications can further increase the credibility of environmental claims, as such labels have been found to achieve higher levels of consumer trust than information provided by firms alone (due to their vested interest) (Taufique, et al., 2017; Testa, et al., 2013). Transparency of standards and how these are enforced are further essential conditions to facilitate consumers reassurance as well

as traceability of the actors and actions throughout the products' value chains (van Amstel, et al., 2008).

2.2.5 Perceived value and willingness to pay

Because eco-labelled products are often associated with additional costs for environmental improvements, consumers must be willing to pay a price premium for eco-labels to thrive (Delmas & Lessem, 2017). Increasing environmental concern has been found to impact consumers' attitudes and strongly motivate green purchase intention (Chen, et al., 2018; Liu, et al., 2017; Nguyena & Le, 2020). However, although altruistic consumers might have a higher willingness to pay for labelled products, they are only making a small part of the consumer population (Delmas & Lessem, 2017). Additional private benefits (such as better taste, longer shelf-life, or health benefits) are another strong motivator of green purchase intention. A Dutch study exploring preferences for fresh strawberries found that consumers were willing to pay a price premium for products with any sustainability claims. However, claims such as reduced pesticides, which include both environmental and private health benefits, retained the highest consumer value (Chen, et al., 2018). This is consistent with other study findings, indicating that consumers are more likely to purchase eco-labelled products that highlights additional benefits (Chen, et al., 2018; Delmas & Lessem, 2017; Liu, et al., 2017; Nguyena & Le, 2020).

Moreover, consumers' demographic characteristics (such as gender, age, education, and income), perception variables (such as importance ratings of product attributes) and not least their purchase habits (such as what they normally pay for a product), directly impact their preference for eco-labels (Chen, et al., 2018; Liu, et al., 2017; Mäkiniemi & Vainio, 2014; Taufique, et al., 2013). This is in line with Mäkiniemi and Vainio (2014) findings, showing that perceived barriers for eco-friendly food choices vary among consumers segments. Generally, women consider high prices and poor availability as the most relevant barriers, whereas men consider disbelief, strangeness, and habit as most critical. Furthermore, the study found that consumers eating meat had more barriers than vegetarians (ibid).

Although consumers might receive a "warm glow" from eco-consumption, studies have found that eco-labels might be perceived as a signal of lower quality, hence decreasing consumers' willingness to pay a premium for such products (Delmas & Lessem, 2017). It is further implied that other quality signals, such as characteristics associated with the company's brand, might reinforce or interact negatively with the eco-label (Chen, et al., 2018).

In summary, the willingness to pay for eco-labelled products differs between consumers (Liu, et al., 2017), and environmental attributes are valued differently between different consumer segments (Janssen & Hamm, 2014). The interaction profoundly depends on the specific claims that are promoted and how these claims align with the consumer's perceptions, social image, values and norms (Chen, et al., 2018; Ihemezie, 2018). These conditions emphasize the importance of product differentiation and market segmentation, that is, "selling the right product to the right group of consumers" (Chen, et al., 2018:207).

3. Methodology

The following chapter provides a detailed description of the study's research approach and explains Q-methodology application: design, recruitment, procedure, and analysis. The chapter further addresses the quality criteria and ethical considerations of the research.

3.1 Research approach

This study aims to investigate the food industry's perspectives on eco-labels in a Swedish context. To reveal those views, knowledge, and beliefs, the study is based on Q methodology, an exploratory approach designed to provide a structured assessment of human subjectivity (Webler & Danielson, 2009). In a set of connected techniques, Q methodology enables the discovery of current predominant social perspectives relative to a chosen subject matter, i.e., eco-labelling (ibid). The method combines the strengths of both qualitative and quantitative methods, allowing the viewpoints to be explicated in a systematic, holistic, and qualitatively rich fashion (Watts & Stenner, 2012).

Q methodology's underlying ontological perspective is based on a social constructionist view, focusing on social and sociological aspects of meaning construction (Watts & Stenner, 2012; Bryman & Bell, 2011). According to Watts and Stenner (2012), constructionist research aims to target social facts, such as human emotions, ideas, and ideals, in a multiple participant design (ibid). By transferring personal aspects to social components, Q methodology therefore becomes a suitable method to understand the shared meanings, bodies of knowledge, and discourse on the topic of eco-labelling that the study seeks to explore.

However, combining the ontological perspective with the study's aim comes with limitations. The study investigates organisations' viewpoints of eco-labelling but relies on interviews with employees representing their organisations. Although interviewees are implicitly expected to express the organisations' perspective, it is realistic to believe that the results are contingent on the individuals' personal views.

At the time of writing, an insignificant amount of literature has focused on the food industry's perspective on eco-labelling. To generate logical inferences and pragmatically construct theory on the relatively undiscovered topic, the study follows abductive reasoning. Abductive reasoning is a suitable approach to investigating empirical phenomena that existing theory cannot yet account for (Bryman & Bell, 2011). The approach is designed for discovery and theory generation, turning a surprising empirical fact into some more general phenomenon by applying a plausible theory or hypothesis to explain that fact (Watts & Stenner, 2012). The approach allows the researcher to remain open to "the possibility of being surprised by the research data" (Bryman & Bell, 2011:27) rather than using it for testing and theory verification (Watts & Stenner, 2012).

3.2 Literature review

A narrative literature review on eco-labelling was conducted throughout the research process as the study emerged. Reviewing previous literature enabled to identify the research gap this study intends to fill and further developed the study's conceptual framework by connecting existing theories and concepts.

The central databases used for the literature search were Google Scholar, Primo, and Web of Science. Literature was identified using key terms, including "eco-label," "eco-labelling," "food-labelling," and "green purchase intention".

The literature review revealed an emerging field of research regarding consumers preferences and understanding of eco-label attributes. However, little or no research has focused on investigating the food sector's perspective, which can be seen as necessary since they are responsible for designing, implementing and promoting the labelling standards. Further, has few studies investigated labels from a more general perspective. Hence, the literature does not fully explain what issues associated with eco-labels might be of most concern. Moreover, the review revealed that ES, to present, has been a rare concept to communicate through labels.

3.3 Q methodology

This section provides an overview of Q methodology and explains the procedure of how the method has been applied in the study.

3.3.1 General overview of Q methodology

Q methodology was developed by the psychologist William Stephenson in the 1930s in the pursuit to find new methods for studying human attitudes and beliefs (Webler & Danielson, 2009). As an inverted version of factor analysis, Q methodology provides a structured approach in investigating individuals' communicated viewpoints -also referred to as subjectivity- on a chosen subject of matter (Watts & Stenner, 2012). The method is generally used in exploratory research and fits under the broad umbrella of "discourse analysis technique" (Webler & Danielson, 2009). Like similar analysis techniques, Q methodology aim to reveal the wide range of social perspectives that exist on a topic, in order to find underlying patterns and meanings. The methodology is self-referential, meaning that participants are "expected to respond to statements using their internal yardsticks" (Webler & Danielson, 2009). Since the Q study participants react to a pre-determined set of statements, the responses can be compared in a direct and consistent manner. This is unusual in other discourse analyses, giving Q methodology an advantage (ibid).

A Q study is carried out in several steps, beginning with (1) identifying an existing topic and its concourse. The concourse consists of the things written or spoken about the subject and should capture the breath and variety of the general discourse. (2) From the concourse a representative sample of Q statements, each being expressed as an opinion, is extracted to form a Q set. (3) Q participants, representing a broad view on the topic, are identified and selected. They should (4) rank the statements by sorting them onto a forced-choice distribution grid (similar to Likert scales) so that each item allocates a rank score. The items are ranked relative to each other which forces the participants to discriminate between statements. The resulting sets of ranked scores, in Q terminology referred to as Q sorts, are then (5) analysed using statistical techniques of correlation and factor analysis. By combining quantitative and qualitative elements the analysis helps to reveal patterns of shared meaning, find consensus, and map out differences of opinion on the object of interest (Watts & Stenner, 2012).

Figure 1. Procedure of Q method, own illustration.

Q methodology has been applied in a wide field of research and appears in an increasing number of modern studies on environmental issues, including eco-certification (Chikudza, et al., 2020; Azizah, et al., 2020), ES (Hermelingmeier & Nicholas, 2017; Winkler & Nicholas, 2016), and global environmental change (Mosera & Baulcombb, 2020). The method is well suited to address environmental issues. It is considered a useful method to reveal surprising viewpoints on such complex and disputed areas and can further help when respondents do not have readily articulated views of the topic (Webler & Danielson, 2009).

3.3.2 Q-set design and content

This study is part of the EU-funded research project Contracts 2.0, led by Leibniz-Centre for Agricultural Landscape Research (ZALF) in Germany. The project aims to model consumer preferences for label-based approaches to stimulate the provision of ES within the food value chain. To address the broad discourse on the topic and gather valuable information prior to the research, preparatory Q-studies have been conducted with food companies in Spain, Poland, and Germany. By analysing the Swedish food sector's perceptions of eco-labelling, this study aims to contribute to the research with a Swedish perspective. Because of this, the Q-set design and content were developed by researchers within the Contracts 2.0 project prior to this study. The section below describes their process of sampling the concourse and creating the Q statements.

Sampling the concourse

The first practical stage in the Q-study was to collect statements from the concourse of eco-labelling. The goal was to capture the wide range of ways eco-labelling were

represented in the general discourse and to identify the key issues characterizing the topic. Resources to sample the concourse can include a diverse selection of both written and verbal material (Watts & Stenner, 2012). The study's written information was obtained through a narrow literature review of academic publications on label-consumer relationships and economic implications of ES. Verbal material was collected from two primary sources: an in-depth interview with a German professor of marketing and a workshop on sustainable agricultural practices organized by the German baby-food company Hipp (20th of February 2020, Pfaffenhofen, Germany).

Once the concourse was identified, opinion statements about eco-labels were extracted and categorized according to their content. It might be important to note that the extracted statements were examples of subjective concourse rather than factual items. As the Q study aim to capture subjective understanding and meaning, the participants have to be given a chance to impose their viewpoint on the statements.

Based on the literature review, interview, and workshop, five categories on the topic of eco-labels were identified:
- Communication of labels
- Relation to consumers
- Image of the enterprise
- Limits of labels
- Ecosystem services and labels

Creating the Q sample

Second, a sub-set of statements were carefully selected out of the concourse to form the final Q sample -the set of Q statements that were to be ranked by the participants. The selection process sought to present the minimum number of statements necessary to cover the whole spectrum of perspectives and opinions on the topic of eco-labelling (Webler & Danielson, 2009).

As the Q sample function as the building bock to characterize understanding in a Q study, it is crucial that the sample provides representative and balanced coverage without overlap, unnecessary repetition, or redundancy. The Q items should be unbiased and relatively balanced in terms of numbers of negative and positive propositions. Participants should successfully impose their viewpoints on the topic and not feel restricted or limited due to poor representation or unbalance (Watts & Stenner, 2012). To highlight any such potential failures, the selection process was conducted by two researchers familiar with Q methodology and experienced in the

field of eco-labelling. Each category was discussed, and the statements considered most representative were selected.

Items of a Q sample should be unambiguous and expressed in clear, concise, and straightforward language. Further, should the wording be appropriate to the participants' sophistication level (Watts & Stenner, 2012). Piloting the Q sample, the initial set of items was reviewed, and some statements were rephrased to clarify their content. The translation from German to Swedish was carefully conducted and revised in several steps to ensure that they retained their meaning.

Although there are several quality criteria for creating a good Q sample, Q methodology is considered an extremely robust method. Watts & Stenner (2012) explains that "because a Q sample invites active configuration by the participants, and their effort after meaning, even a poorly designed Q set is to deliver useful results" (ibid).

There is no optimal number of items in a Q sample. A small number of items may not provide sufficient coverage, while a high number may make the sorting process complex and effortful. Most Q studies are using a Q sample of 40 to 80 items (Watts & Stenner, 2012). Out of the identified categories in this study, 45 statements were retained to form the final Q sample (see table 2).

3.3.3 Recruitment of participants

The aim of recruitment in a Q study is to access a diverse range of interesting, informative, and relevant viewpoints (Watts & Stenner, 2012). In this study, that meant finding participants with a defined viewpoint that mattered in relation to eco-labelling. Furthermore, the aim was to include different stakeholder groups along the food value chain to cover different potential interests regarding eco-labelling (such as to maximize profits, attract consumers or provide standards). The participants were selected out of three stakeholder groups: processors, retailers and label organisations. To capture as many pertinent demographic groups as possible, participants were selected in a strategic approach based on organisational requisites such as size and type, as well as how long the company had been operating in the market. An inclusion criterion for all participants was that they had prior experiences of eco-labels or engagement in sustainability projects. This to assure that they were familiar with the topic and had some degree of intrinsic motivation and interest in participating.

As the study sought to discover patterns and meanings, rather than quantifying and generalize to a population, a large number of participants were not required. However, a rule of thumb is to stick to a number of participants that is less than the

number of items in the Q set. Usually, a ratio of 3:1 is applied (Webler & Danielson, 2009). For this study of 45 Q statements, the ideal number was therefore 15 participants.

A total of 23 potential participants were invited to participate via e-mail. Of the 10 participants in the final P set, 8 were women, and 2 were men. The participants were distributed between 6 processors, 2 retailers and 2 label organisations. For anonymity reasons, the following order does not correspond with the latter numbering of participants used within the analysis.

Arla

The cooperative Arla, with roots in the early 1910's, is one of the world's largest dairy companies. Together with their 9,759 farmer-owners, located in seven countries, Arla has set a climate ambition to become carbon net-zero by 2050. Except from their own carbon net-zero label, dairy products sold on the Swedish market are labelled with EU-organic and KRAV. Approximately 20 percent of the volumes sold on the Swedish market constitutes an eco-label (Arla, 2021).

Coop

With a clear ambition to be "the good force in food Sweden," Coop -one of Sweden's largest grocery trades- aims to be at the forefront of environmental and sustainable development. The cooperative, established in 1899, have about 800 grocery stores around the country and is owned by 3,5 million member-owners. Their assortment includes most of the eco-labels that can be found on the market, including their own labels for organic and eco-friendly products: "Eko", "Miljö-märkt," and "Treklövern". About 30 percent of Coop's total sales consist of products with eco-labels (Coop, 2021).

KRAV

KRAV is Sweden's most well-known environmental food label. Their standards comply with the EU regulation for organic production with additional standards for animal welfare, environmental and health, climate, and better working conditions. KRAV has pursued the development of organic and sustainable food production since 1985 and is today including areas such as agriculture, slaughter, fisheries, restaurants, and caterers (KRAV, 2021).

Lantmännen Cerealia

Lantmännen Cerealia is part of the agricultural cooperative Lantmännen. The cooperative, founded in 1905, is northern Europe's leader in agriculture, machinery, bioenergy and food products. Lantmännen Cerealia produce and sell a wide range of grain-based products, such as flour, muesli, pasta, ready-to-eat meals, beans and

nut-based drinks. Their products are sold to Nordic consumers under well-known brands such as Kungsörnen, FINN CRISP, AXA, GoGreen and Gooh. Their assortment includes most of the traditional labels that can be found on the market. Approximately 30 percent of their products are labelled with an eco-label (Lantmännen, 2021).

Magnihill

Magnihill is a family business with roots from 1957. Their philosophy is to grow, produce, and import frozen fruits and vegetables of high quality and promote the development of organic products. Magnihill's products are certified with EU-organic, and KRAV. More than 50 percent of their products contains an eco-label (Magnihill, 2021).

Mat.se

The online grocery store Mat.se helps consumers make more sustainable choices by, among other things, offering a wide range of organic products, offering a vegan shop, and by labelling a large number of their products with their own climate symbol. The label indicates how much carbon dioxide emissions each product leads to, calculated in the amount of carbon dioxide equivalents (CO_2e) per kilogram product. Mat.se was founded in 2012 and is offering home deliveries in Stockholm and Gothenburg. Approximately 20 percent of their sales consist of products with eco-labels (excl. their own climate symbol) (Mat.se, 2021).

Nordisk Råvara

Nordisk Råvara was established in 2016 with the ambition to enrich the agricultural landscape and our Swedish food culture. By producing cultural heritage plants and crops the company wants to offer alternatives that help repair the environment e.g., by binding carbon dioxide from the air into the ground. Their product range includes traditional and non-traditional crops such as beans, lentils, quinoa, and lupine and is sold to Nordic consumers. All their products are produced in Sweden in compliance with KRAV-certified standards. Their products are labelled with EU-organic and KRAV (Nordisk Råvara, 2021).

Spendrups

Founded in 1897, the family business Spendrups is the largest brewery and beverage group in Sweden. Spendrups produce, import, distribute and sell beverages such as wine, beer, cider, soft drinks and water. Their assortment is sold to European consumers under well-known brands such as Norrlands Guld, Mariestads, Briska, and Loka. Spendrups´ environmental policy seeks to contribute to an ecologically sustainable society and focus on minimizing climate impact and optimizing the use of natural resources, taking into account a life cycle perspective.

In 2019, Spendrups brewed 11,7 million litres of organic beer -making them the world leader in organically produced beers. Spendrups label their products with EU-organic (Spendrups, 2021).

Svenskt Butikskött

Svenskt Butikskött is a family business in the second generation that has offered Swedish meat and charcuterie products since the 1970s. With the ambition to "be ahead and do a little bit more," Svenskt Butikskött has become the largest supplier of KRAV-certified meats for the grocery and public sectors, including brands such as AXFOOD's Garant, and ICA's I love Eco. Svenskt Butikskött's products are certified with EU-organic, KRAV and Kött från Sverige. Approximately 50 percent of their volumes consist of products with eco-labels (Svenskt Butikskött, 2021).

Svenskt Sigill

Svenskt Sigill is a certified eco-label for Swedish food and flowers, established in 1995. All products granted with Svenskt Sigill must comply with the minimum standards of IP Sigill, which quality assurance that goes beyond current Swedish legalisation in the areas of animal welfare, environment and food safety. The products can additionally be labelled with Svenskt Sigill Klimatcertifiering (which means that the production has taken measures for reduced climate impact) and Svenskt Sigill Naturbeteskött (which means that the animals have grazed natural pasture) (Svenskt Sigill, 2021).

3.3.4 Q-sorting procedure

Q-sorting is a procedure where the participants read the items and rank them by their level of agreement. The process's outcome is called a Q sort and constitutes a pattern representing the participant's beliefs and understandings (Watts & Stenner, 2012).

The Q sorts were completed in one-to-one sessions via the video conferencing platform Zoom. Each session lasted between one and two hours and was recorded upon the participant's formal consent. Detailed instructions on how to complete the Q sort were provided in written form before the session and verbally throughout the one-to-one session (see appendix 1). The Q-sorting process was carried out in three steps through the Htmlq software by Aproxima, based on the FlashQ package of Christian Hackert and Gernot Brähler (Hackert & Brähler, 2020).

Procedure
1) As a first step in the Q sorting procedure, participants were required to read the Q items, each presented on a separate and numbered card, and sort them into three categories: (1) AGREE, items about which they felt positive (2)

DISAGREE, items about which they felt negative and (3) NEUTRAL, items about which they felt indifferent or unsure (see figure 3).
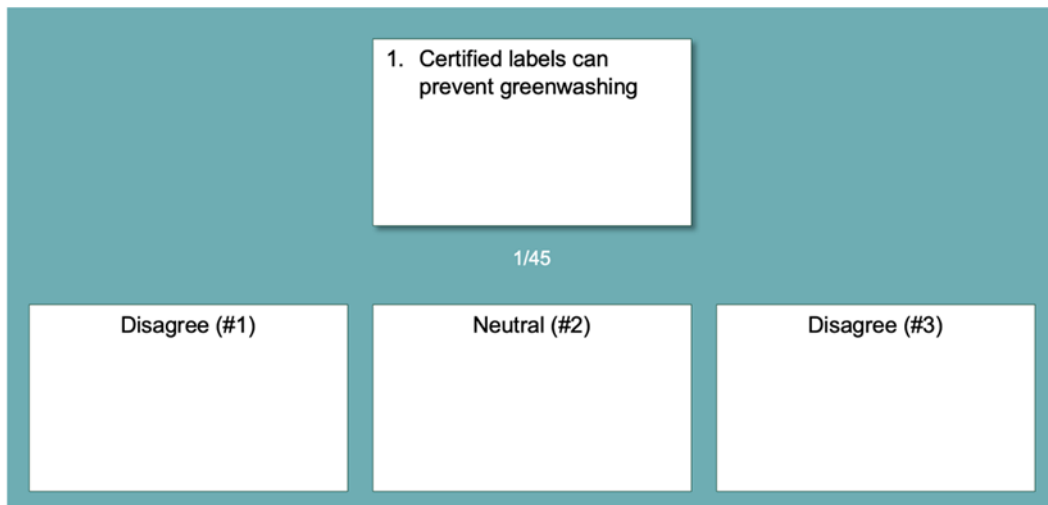

1. Certified labels can prevent greenwashing

1/45

Disagree (#1) Neutral (#2) Disagree (#3)

Figure SEQ Figure * AFigure 2. Empty Q-sort, owFigure 3. Procedure of Q method, own illustration.lustration.own illustration.

2) After dividing all items into three categories, the participants were asked to place the items onto a forced-choice distribution grid, consisting of an 11-point scale, ranging from +5 (strongly agree) to -5 (strongly disagree).

A fixed distribution determined how many items could be allocated to each point on the scale. The method can be considered constraining but is convenient as it ensures participants to make discriminations between items (Watts & Stenner, 2012). Thus, participants are forced to make choices, and when making choices, they reveal their values, attitudes, and viewpoints (Webler & Danielson, 2009).

It is important to consider the shape of the distribution as it can help the participants to feel more comfortable about their sorting (Watts & Stenner, 2012). Brown (1990) recommends a steep distribution when participants are unfamiliar with the topic or if the topic is considered complex (ibid). A steep distribution allows the participants to place more items near the middle of the scale and make fewer decisions about a comparatively large number of statements. In contrast, a more flattened distribution offers a greater opportunity to make fine-grained discriminations at the distribution's extremes and is suitable for more specific topics or where the participants possess excellent topic knowledge (Watts & Stenner, 2012). The participants of this study were considered familiar with eco-labelling. However, due to the topic's complexity, a moderate slope for the

distribution was found most suitable. The distribution provided the allocation of two items each at the extremes, column +5 and -5, and seven
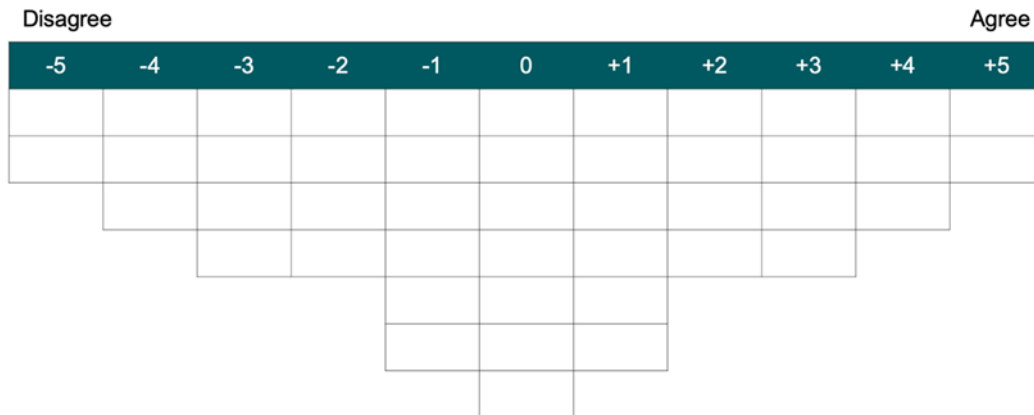
Figure 4. Empty Q-sort, own illustration.

Figure 5. Empty Q-sort, own illustration.

items at the middle, column 0 (see figure 4).

The participants began the sorting process by selecting the AGREE category, reading the items once again, choosing the two statements he/she agreed with most strongly, and placing them in any order in column +5. The procedure continued by placing the three items of the second strongest agreement in column +4, followed by placing items in column +3, and so on. When all the items from the AGREE category had been sorted, the participants repeated the procedure for the DISAGREE category. Lastly, the participants distributed the items from the NEUTRAL category into the remaining gaps.

Assigning an item a positive or negative ranking did not indicate agreement or disagreement. It only meant that the participant agreed more or less with the item relative to the items below and above. For example, a zero ranking did not have to indicate a neutral point or no feeling of meaning. The zero only meant one more than −1 and one less than +1 (Watts & Stenner, 2012). The transition between the categories agree, disagree, and neutral was recorded to assess where participants' positive/negative feelings began.

To achieve a fuller and more detailed understanding of each Q sort, participants were encouraged to communicate during the sorting procedure by commenting on the items and their perceived meaning as well as reflecting upon the item allocation. The insights facilitated factor-

interpretation in the analysis stage and provided feedback on the quality and validity of the items chosen for the Q set (Watts & Stenner, 2012).

Disagree										Agree
-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
1	12	3	42	2	14	6	8	9	5	32
43	21	4	15	10	17	7	22	11	13	40
	35	27	20	23	19	18	34	28	16	
		45	41	24	31	25	38	37		
				29	33	26				
				30	36	44				
					39					

Figure 6. Complete Q-sort, own illustration.

Figure 7. Complete Q-sort, own illustration.

3) Once the participants were satisfied with their Q sort, they were asked to discuss and reflect upon the motives behind the allocation, e.g., why some items were more important to them than others. The interviews were finalized with demographic questions about the participant and the organisation he/she was representing. The distribution of item numbers got transcribed onto a data collection sheet and input for data analysis.

3.3.5 Statistical analysis

Once all ten Q sorts had been collected, the data was systematically analysed. The analysis process integrated quantitative and qualitative techniques to investigate patterns across and within individual Q sorts. The aim was to find factors that could be interpreted as the dominant perspectives held by the group of participants. The analysis comprised three methodological transitions: (1) from Q sorts to factors, (2) from factors to factor arrays, and (3) from factor arrays to factor interpretation (Watts & Stenner, 2012).

Factor extraction

By entering the data into the Q dedicated package "qmethod" within the statistical software "R" (Zabala, 2014) the first step in the analytic process was to calculate pair-wise Pearson's R correlations between all the item scores for all participants. The scores on the resulting correlation matrix reflected the degree of similarity and difference between all items and represented the full range of meaning variability in the study, also referred to as the variance (Watts & Stenner, 2012).

The next step was to apply a principal component analysis (PCA), a reduction technique to detect and cluster respondents into groups based on similarity of statement ranking. The function of PCA is to boil down the study variance's complexity to a more manageable representation (Webler & Danielson, 2009). This is done by extracting a handful of factors, described by Watts & Stenner (2012) as "sizable proportions of the common meaning represented in the data" (ibid). Each factor is derived based on shared meaning and represent the key viewpoints held in common within the participant group (Watts & Stenner, 2012).

Following this, the factors were subjected to Varimax rotation to find the solution that maximized the explained variance in the factors. Deciding on how many factors to extract and which to retain, also involves a great deal of judgment (Webler & Danielson, 2009). There are however various objective criteria to help making the decision (Watts & Stenner, 2012). The following criteria was used for the study:

1. **Number of Q sorts loading on a factor**
   Because it is mathematically impossible to distinguish a social narrative from a single perspective, a factor must be defined by a minimum of two Q-sorts.

2. **Kaiser Guttmann criterion**
   By summing the squared loadings of all Q sorts on a factor, the Kaiser criterion indicates a factor's statistical strength and potential explanatory power. Factors with an eigenvalue (EV) above 1.00 are retained while factors below EV 1.00 are omitted. The latter factors constitute a smaller study variance than a single Q-sort, and thus, cannot contribute to an effective reduction of the correlation matrix.

3. *Explanatory variance*
   Factors should explain as much of the variance in the correlation matrix as possible. The higher the factor loading, the more variance is accounted for. To provide significance, the combined variance of the extracted factors should exceed 0.35.

4. **Humphrey's rule**
   Another parameter to determine a factor's significance is calculating the cross product of the factor's two highest loadings. The factor is significant when the product exceeds twice the standard error (equations 1, 2).

   Standard error $= \frac{1}{\sqrt{n}}$, where n = number of statements (1)
   Humphrey's rule threshold $= \frac{2}{\sqrt{n}}$, where n = number of statements (2)
   In a study with 45 statements, Humphrey's rule threshold is therefore (equation3)

$$\frac{2}{\sqrt{45}} = 0.30 \text{ (3)}$$

5. **Cattell's scree test**

   A Scree test plots EVs on a line graph indicating the number of factors to extract. After the point at which the line change slope and becomes flat, little or no additional variation content can be achieved. Thus, additional factor extractions are irrelevant/of no interest.

Factor arrays

For ease of interpretation, the exemplars that loaded significantly onto a factor were merged to form a single normalized Q sort. The normalized Q sorts, also called factor arrays, were calculated in a procedure using a weighted average of all exemplar sorts, i.e., higher loading exemplars were given more weight since they represented the factor to a greater extent. Although it is not considered necessary to generate factor arrays (Watts & Stenner, 2012), the pictorial representation of each factor's normalized Q sort provided the basis for interpretation and enabled understanding to emerge more clearly.

Factor interpretation

The third and final transition took the form of a careful and holistic interpretation of the pattering of items in the factor arrays. A Q analysis is interested in finding patterns across and within individual Q sorts: explaining the entire item configuration and capturing the factor's viewpoint as a whole (Watts & Stenner, 2012). In a hermeneutic process, the highest and lowest ranked items in each factor array were examined (Stennera, et al., 2003). Any apparent discrepancies within the factor were discussed, i.e., where an item's placing seemed odd relative to the rest of the sort pattern. Further, the apparent cross-factor differences were identified, such as items ranked higher or lower relative to any other factors. This process helped to identify critical issues in which the factor was polarized (Watts & Stenner, 2012).

The interpretation was carried out using the logic of abductive reasoning seeking reason and meaning behind each factor. Inclusion of participant's comments and demographic information provided discrepancy and crucial validity to support the interpretation and composition of the narratives (Watts & Stenner, 2012; Stennera, et al., 2003).

3.4 Quality criteria

Q methodology is often criticized for using pre-selected items and constraining procedures resulting in non-independent data. This can be argued as no different from other qualitative methods such as interviews and focus groups, constraining interviewees using predefined schedules (Webler & Danielson, 2009). A critical quality criterion, however, is that the Q sample is unbiased. The concourse must be explored adequately, the items selected without an agenda in mind, and the participant recruitment must be based on diversity (Watts & Stenner, 2012; Webler & Danielson, 2009). Furthermore, A Q sorting process can be complicated and demanding for the participant, and if the statements are poorly or ambiguously worded, the resulting data will suffer (Watts & Stenner, 2012).

Traditional quantitative researchers often direct criticism at the relatively small P sample and the small number of Q sorts (Webler & Danielson, 2009). As a Q study seeks to explore predominant social perspectives rather than to achieve representative results, there is no need for a large number of participants (Watts & Stenner, 2012). However, when conducting a study with a relatively small number of samples, the risk of these units not representing the breadth of opinions in the target population increases. Hence, emphasizing the importance of a diverse participant recruitment (Watts & Stenner, 2012).

This study strives to maintain transparency by providing a full explanation of how the method has been applied. By this, the reader may make a personal judgment as to the appropriateness of how the conclusions of the study have been drawn (Bryman & Bell, 2011).

3.5 Ethical considerations

This study was carried out within the guidelines of ethical principles by Bryman and Bell (2011). It was based on informed consent, meaning that participants were well informed about the research in order to make informed decisions (ibid). Prior to participation in the study, respondents were provided with an information sheet about the study's purpose and procedure and what their participation would entail (see appendix 1). Before the interview, each respondent was asked to sign a consent form based on the standard suggested by the research project this thesis was embedded in (see appendix 2). The information sheet and consent form both clarified that participation was voluntary, and with respect to the participants' privacy, the respondents were allowed to withdraw from the study at any time. Recording of the interview was optional, and a summary of the study findings was offered to the participants for approval.

All data provided by participants were treated confidentially and used exclusively for the research. To guarantee the participants' integrity and protect personal data, all interviews were anonymized, and no personal information was published. In compliance with the guidelines for management of research data, EU General Data Protection Regulation, no data was stored on computers that could be associated with an individual.

The study took place in the times of Covid-19. To avoid the spread of the virus, all interviews were conducted virtually via the video conferencing platform Zoom.

4. Results and analysis

This chapter presents the study results, beginning with the quantitative results revealed from the statistical analysis, followed by a qualitative interpretation of the identified perceptions.

4.1 Quantitative results

Following principal component analysis and factor rotation, a three-factor solution was selected since it satisfied the following quantitative criteria (see Table 1) and provided coherent qualitative narratives.

- A minimum of 2 Q-sorts that significantly loaded on each factor
- Explanatory variance > 0.35
- Kaiser-Guttman criterion, Eigenvalue > 1.00
- Humphrey's Rule > 0.30
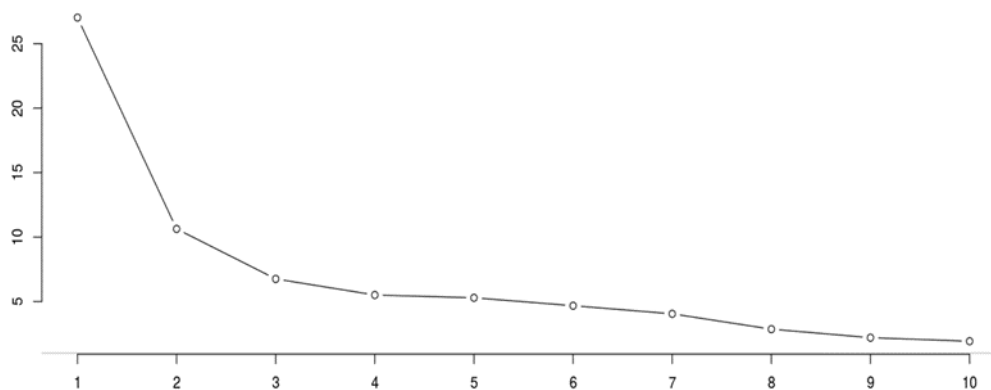- Cattell's scree test (see figure 6)

Figure 8. Scree plot of factor loadings.

FiFigure 9. First distribution of Q statements, own illustration.gure 10. Scree plot of factor loadings.

Table 1. Factor loading for each participant. Bold values are significant defining scores

Respondent ID	Stakeholder group	F1	F2	F3
Factor 1				
4	Label Organisation	**0.86**	0.08	0.13
6	Producer	**0.63**	0.12	0.45
7	Retailer	**0.72**	0.15	0.20
8	Label Organisation	**0.65**	0.03	0.39
Factor 2				
1	Producer	0.19	**0.79**	0.06
2	Producer	0.02	**0.82**	0.13
Factor 3				
3	Producer	0.28	-0.15	**0.68**
5	Producer	0.31	0.20	**0.65**
10	Producer	-0.03	0.48	**0.61**
Confounded Q-sorts (more than one factor)				
9	Retailer	0.56	0.55	-0.12
Statistical analysis after varimax rotation				
% Explained variance		25.96	19.54	17.13
Eigen values		2.60	1.95	1.71
Composite reliability		0.94	0.89	0.92
Total defining Q-sorts		4.00	2.00	3.00

Of ten Q-sorts, nine loaded significantly onto each of the three factors. Each factor was derived based on shared meaning and represents the key viewpoints held in common within each participant group (Watts & Stenner, 2012). The factors explain 63 percent of the total variance. The remaining Q-sort had mixed views between factor 1 and 2 and could not load significantly onto any factor. Because it did not clearly define any unique social perspective, the Q-sort was excluded in the development of narratives.

4.2 Qualitative results

The three factors were interpreted according to their normalized factor scores, distinguishing statements, and relevant interview information. Moreover, points of consensus were identified when all factors shared similar ranking scores for certain statements. The resulting factor narratives are presented with summary demographic details of the participants that loaded significantly onto that factor. Relevant statements are presented with the statement number and ranking score in parenthesis. For example, (12: +5) indicate that statement 12 is ranked as +5 (most important) in that factor's factor array Q sort. With the risk of oversimplification, the study follows Q praxis in supplying the interpretation of each factor with a title, giving a clue of their dominant features.

Table 2. Q-sample statements and normalized factor scores for each factor. Bold numbers indicate the agreement scores (4 and 5) and the disagreement scores (-4 and -5). ES is an abbreviation for ecosystem services.

No	Statements	F1	F2	F3
1	Certified labels can help to prevent greenwashing	1	-1	1
2	The EU and individual countries should verify labels on their credibility	-2	**5**	-2
3	ES cannot be represented by labels, because value chains are too complex	**-5**	**-4**	-3
4	Environmental services do not benefit from public perception as e.g., Fair Trade or animal welfare	-2	0	**-4**
5	A label can help to offer the right incentives for ES provision in agriculture	2	**5**	3
6	It would make sense to include information on the product's ecological footprint on the label	-1	1	1
7	Information on the product's environmental impact is as important as nutritional value	0	0	1
8	Consumers who buy organic products expect that these products provide the highest possible level of organic	2	-2	0
9	It is more effective to invest in a company image than in product credibility	-3	0	1
10	QR codes are suitable for providing consumers with relevant information	0	-3	-1
11	A good company image entails a higher benefit for complex products than an ES certification on the product	-2	1	0
12	Only with a label, consumers will be able to comprehend a product's value chain	-1	1	-3

13	The variety of labels cause consumer confusion	0	2	**4**
14	The provision of ES is only possible if it entails economic benefits	**5**	**-5**	2
15	The presentation of environmental services illustrates producers' contribution to the common welfare	0	**-4**	0
16	Communication of environmental services is an effective way to improve a company's image	**4**	2	**4**
17	The communication of ES enables to illustrate product differences for consumers	3	0	1
18	Local environmental services are particularly appealing to consumers	1	-1	3
19	Transparent norms for the accounting of ES are necessary	**5**	**4**	**4**
20	Consumers would be willing to accept a product-related "fee" for the provision of environmental services	**4**	-1	0
21	Eco-labels are more attractive than agri-environmental schemes	-1	-1	-1
22	The public discourse determines which environmental services are perceived as important	3	0	**5**
23	An additional eco-label, which include information on ES impacts, can be used to realize market advantages	1	1	0
24	An increased willingness-to-pay for environmental services is not sufficient to cover the additional costs of implementing the services	1	-3	-3
25	To restrict the number of labels is necessary	-2	**4**	0
26	Different environmental services have different potentials to appeal to consumers	0	2	2
27	Consumers are not willing to pay a higher price for environmental services	**-5**	0	**-4**
28	There is already too much product information	**-4**	-2	2
29	Rather than quantifying the environmental services of entire products, companies should focus on evaluating single production inputs	**-4**	1	-1
30	Environmental services should relate to the whole product and not to single components	2	1	-1
31	Rather than quantifying the environmental services of single products, companies should invest in their sustainability image of the whole company	-3	**-5**	-2

32	Additional information on environmental consequences regarding production processes is useful for consumers	-1	3	2
33	If consumers are not familiar with the ES, a successful implementation is not possible	-1	3	1
34	The norms of existing labels should be extended rather than creating new labels	3	-3	**-4**
35	Environmental services do not necessarily have to be linked to the product. The service itself counts	**-4**	**-4**	**-5**
36	Information regarding environmental services is too complex to be reduced to a label	-3	-2	-1
37	Environmental services should be clearly linked to the product	1	3	-1
38	Local ES have potential to not only reach people who buy organic anyways, but also average consumers	3	**4**	3
39	Consumers would be unable to cope with information on environmental services	2	-1	-2
40	Eco-label standards strongly differ, yet consumers are not able to distinguish between the different norms	0	0	**5**
41	Labels should target more than only one consumer group	1	-2	0
42	Environmental service labels can only target specific groups	-3	-1	-3
43	A traffic light system for environmental friendliness would be a suitable tool to draw attention towards it	0	2	**-5**
44	Labels are important to create consumers' trust	**4**	3	3
45	Product advantages can only be realised by emphasising the benefits of ES for the individual consumer (e.g., beautiful landscapes for recreation)	-1	-3	-2

4.2.1 Common ground

The analysis revealed ten statements of consensus. All participants consider that communication about ES can strengthen a company brand (16: +4, +2, +4), and eco-labels are perceived to have potential to gain consumer trust (44: +4, +3, +3). Transparent standards are considered a requirement to measure and report ES (19: +5, +4, +4). Another essential condition is that the ES is linked to the actual product in order to prevent greenwashing (35: -4, -4, -5).

The participants do not believe that labels are restricted to target only a specific consumer segment (42: -3, -1, -3). Different ES have potential to appeal to different consumers (26: 0, +2, +2). However, local ES seem to appeal to consumers in particular and local ES have the potential to attract a broader category of consumers, not just those who already choose eco-labelled goods (38: +3, +4, +3).

The results show that the participants had neutral opinions regarding information of product's environmental impacts in comparison to nutrition information (7: 0, 0, 1) and whether eco-labels are more attractive than agri-environmental schemes (21: -1, -1, -1). Finally, the three factors have a slightly positive opinion that additional labels, including information on ES impacts, can be used to realize market advantages (23: +1, +1, 0).

4.2.2 Factor 1: Label optimists

Factor 1 explains 26 percent of the study variance. Four participants loaded significantly on the factor (participant 4, 6, 7, and 8) representing all three stakeholder groups: processors, retailers, and label organisations. The organisations were operating on the domestic as well as the international market. Of the four participants all were female with a mean work experience of 17 years within the field of agriculture and/or sustainability, which is considerably higher than in the other factors.

Participants of factor 1 has a positive attitude towards labels' capability to increase incentives for ES within the agri-food production (5: +2). They perceive labels to be potential tools for providing adequate information and strongly disagree that value chains and ES are too complex to be represented by a label (3: -5, 36: -3). "Labels have the capacity to compromise comprehensive information and provide consumers with simple and accessible information which is necessary to help them making easier decisions" (Participant 4). "It is possible but requires holistic and comprehensive labelling schemes" (Participant 8).

In contrast to the other factors, factor 1 is doubtful of consumers' ability to cope with information about environmental issues such as ES (39: +2). Therefore, additional information about food product's environmental impact is not necessarily perceived as useful (32: -1). However, the implementation of ES should not rely on the consumers' knowledge as "the promotion should be explained in a way so everyone can understand, not only those who are already well informed" (33: -1).

Even though exemplars of factor 1 admit that consumers might be confused by the large number of different labels, they do not believe there are too many labels on

the market nor too much product information (28: -4). Neither should the number be restricted (25: -2) as "different labels fill different purposes" (participant 7). The participants have mixed views about extending already existing labels (34: +3). While some believe a holistic approach is essential, and that the number of competing labels should decrease in the long run "even though there is a long way to get there", another finds an extension excessive when there are already existing labelling standards who cover the issue.

Communication about environmental issues, such as ES, is perceived to strengthen a company brand (16: +4). However, to reassure consumers' trust, factor 1 regard eco-labels to be more effective than investments in a general brand image (11: -2 44: +4), although "less concerned consumers might rely more on a brand than a label" (participant 4). It is further perceived as critical to invest in the products rather than the brand image alone (9: -3, 31: -3). Participant 4 explains: "Brand credibility rely on the products. If the products fail, the brand image will fail." "The product reliability is especially important in business-to-business sales" (participant 6).

Factor 1 reflects an apparent economic focus, believing that providing of ES is only possible when entailing economic benefits (14: +5). The participants of factor 1 see a willingness to pay among consumers but are sceptical that the level is high enough to cover the costs of implementing the services in practice (16: +4, 24: +1, 27: -5).

4.2.3 Factor 2: True conservationists

Factor 2 explains 20 percent of the study variance. Two participants loaded significantly on the factor (participant 1 and 2), both representing producers. The organisations were based on the domestic market. One participant was male and one female. They had an average work experience of 10 years within the field of agriculture and/or sustainability.

Factor 2 is characterized by a strong belief in eco-labels' potential to increase incentives for ES within the agri-food production (5: +5). Similar to factor 1, they believe that labels can comprise and communicate the complexity of food systems (3: -4, 12: +1, 36: -2). However, the effectiveness highly depends on the label standards. Participant 2 states: "The label itself is nothing if it is not filled with relevant and credible content."

Successful implementation of ES requires consumer knowledge (33: +3), and additional information of products' environmental impact is therefore perceived as useful and can help consumers to better differentiate between products (32: +3). Participant 1 states: "To be able to make better food choices, information about the

product's environmental impact, such as emission from transportation, must be visible on the package."

Although consumers are perceived as confused by different label standards (13: +2), factor 2 do not believe that there are too many eco-labels on the market of today (28: -2). The increasing number of inconsistent labels, however, impose a need for a restriction (25: +4). As participant 2 states: "Consumers must be able to consider what is available and the space on a food package is limited -everything cannot fit." "It would be better with a few labels based on clear standards" (participant 1). At the same time the participants do not perceive an extension of existing labels as a good idea (34: -3). "Labels such as KRAV could include more features, but an expansion does not make any difference if consumers do not understand that their standards have changed" (participant 1).

Factor 2 value transparency high (19: +4) and strongly agree that EU and individual countries should verify labels' credibility (2: +5). Participant 2 explains: "If standards are not verified, the claims will be arbitrary, and there will be a substantial risk of greenwashing." However, certified labels will not necessarily prevent greenwashing (1: -1).

The participants of factor 2 further stress that claims of environmental improvements, such as ES, must be directly linked to the product as "compensation are directly wrong and misleading" -participant 1 (35: -4, 37: +3). They disagree that companies should invest in their sustainability image before improving their products' environmental impact (31: -5). Participant 1 explains: "Products have either a positive or negative impact on the environment. A sustainability image does not improve the products and does not allow consumers to make informed decisions. It can, on the contrary, function as coverage and be seen as a form of fraud."

Factor 2 has a more negative perception of consumers' willingness to pay for environmental services, such as ES, than the other factors (20: -1, 27: 0). However, in strong contrast to factor 1, they disagree that ES can only be implemented if they entail economic benefits (14: -5). Participant 2 explains: "The incentives would rapidly increase if the producers could see profitable returns, especially in the short term, but there are other ways such as regulation which will force environmental undertakings."

4.2.4 Factor 3: Label sceptics

Factor 3 explains 17 percent of the study variance. Three participants loaded significantly onto the factor (participant 3, 5, and 10), all representing producers.

The organisations were all operating on an international market. Of the three participants one was male and two were female. They had a mean work experience of 10 years within the field of agriculture and/or sustainability.

Although eco-labels are believed to generate incentives for more sustainable food production (5: +3), participants of factor 3 are sceptical of labels' capability of providing adequate information and comprehending the complexity of agri-food systems (3: -3, 12: -3, 36: -1). Participant 10: "Labels tend to focus on a small part of a broad and complex reality. We have not come far enough in research to fully understand the consequences of different production methods. Labelling schemes, therefore, risk becoming nothing but 'glädjekalkyler'."

The exemplars of factor 3 stress a strong influence of public discourse. Media attention is believed to strongly influence consumer behaviour, drive production change, and determine regulation (22: +5). As respondent 10 states: "What we talk about becomes important." Public communication is seen as a cornerstone to create consumer awareness, gain trustworthiness, and provide useful information about the environmental impact of food production (17: +1, 32: +2, 39: -2). Participant 5 explains: "Although it may always be challenging to get the whole picture of the issue, the public debate increases consumer's awareness and understanding. The more we talk about an issue, the more transparency and credibility will be gained - it is all connected."

While information is perceived as a necessity, consumers' comprehension of the information depends on the quality rather than quantity. That is, what statements are claimed, how reliable they are, how well they are communicated, and what relevance they perceive (32: +2). Traffic-light systems are valued low by factor 3, as they are seen as too simple and unsustainable in practice (43: -5). As participant 10 states: "no one would put a red light on their product if it was optional."

Exemplars of factor 3 find the large number of labels to confuse consumers and experience that consumers are having a hard time validating and differentiating between different label standards (13: +4, 28: +2, 40: +5). Participant 10: "There are many different labels, and it is difficult to get a deeper understanding of what they stand for at the time of purchase." However, a restriction of labels and expansion of existing labels is not seen as a suitable solution (23: 0, 25: 0, 34: -4). Participant 3 explains: "Perhaps it is not convenient to have a large number of various labels, but labelling schemes expand at risk of transparency. Standards need to be clear in order to gain credibility."

The participants of factor 3 unanimously believe that transparency is crucial for measuring and reporting ES (19: +4). Participant 5 states: "Transparency is essential as we must be able to trust what is being claimed and understand what it means. Everything else is secondary". Nevertheless, perceptions of certification and verification strongly differ (1: +1, 2: -2). While participant 5 emphasises the importance of certified labels for preventing greenwashing, participant 10 believes that greenwashing can be carried out independent of certification. However, it need not always be negative as "greenwashing can be a company's first step towards real sustainability" (participant 10). Participant 3 states that "although verification of labels' credibility is essential, it does not matter if it is being carried out by the government or by the industry" (participant 3).

Exemplars of factor 3 believe that consumers are willing to pay more for products that provide ES but question how much more (20: 0, 27: -4). They see a clear trend in demand for locally produced foods and believe that communication of local ES can attract a broader category of consumers, not just those who already choose eco-labelled products (18: +3, 38: +3). Labels could and should target more than one specific consumer group because "a label that is not reaching many consumers will not get the same attention in the public debate and thus not become as significant. The label will stay at being just another little label on the market" (participant 5) (41: 0, 42: -1).

5. Discussion

Based on the study analysis, this chapter provides a discussion of the study results and further addresses the study's limitations and methodological implications.

Eco-labelling is a potential approach to influence consumers and producers in a sustainable direction. This study analysed the Swedish food sector's perspective on eco-labelling in order to address the main challenges associated with eco-labelling and to understand in what form eco-labels can set incentives for ES provision. Using Q methodology, the results revealed three distinctive perceptions of eco-labelling. Comparing their rankings and backing up interpretation with in-depth interviews, the findings suggests that perceptions are strongly driven by different values and stakeholder interests. Factor 1 (Label optimists), who represents all stakeholder groups, suggests eco-labels as a short-cut for providing complex information and assists consumers in their purchasing decisions. Factor 2 (True conservationists) represents processors and sees eco-labels as a useful tool to raise consumer awareness and hence increase incentives for ES. Factor 3 (Label sceptics), also representing processors, suggests eco-labels as a marketing approach for creating consumer trust. Each factor further emphasised different challenges associated with eco-labelling and reflected upon several elements essential for increasing the incentives for ES.

Critical challenges of eco-labelling

The main challenges of eco-labelling, identified in the study results, are related to consumers' understanding and comprehension of labels' meanings, confusion caused by the large number of eco-labels on the market, and not least by insufficient provision of adequate product information, although perceived differently for each factor.

Because the influence of labels highly depends on how well consumers recognise and understand the label's meaning, good communication is crucial (Banerjee & Solomon, 2003; Delmas & Lessem, 2017). However, environmental issues are complex, and labels' capacity to communicate such complexity is associated with difficulties. Factor 1, in particular, emphasised the importance of integrated and comprehensive label standards for creating consumer trust and reliability. Factor 2

and 3 on the other hand, preferred eco-labels with well-defined environmental themes and a core message easy to interpret. Their difference of opinion can be understood in relation to their organisational interests. While label organisations (factor 1) aim to provide adequate label standards, processors (factor 2 and 3) use labels to gain competitive advantages by attracting consumers through product differentiation and value creation. These findings reveal a paradoxical dilemma of simplicity versus detail, which is further likely to differ between individuals and product categories. The issue emphasises the challenge of good communication management, regarding terminology for environmental themes and information on how these themes are standardised.

This leads on to another concerning challenge: the increasing number of eco-labels on the market. Excessive labelling and information overload can cause confusion, lead to mistrust and act as a barrier to sustainable consumption (Taufique, et al., 2019). Factor 3, particularly, stressed concerns for the large number of eco-labels and considers that consumers are having difficulties in differentiating between products and different label standards. Yet, factor 1 and factor 2 found a large number to be justified, which is consistent with literature suggesting that different label attributes appeal to different consumer segments (Verbeke, 2005). Nevertheless, it is realistic to believe that fewer but more reliable labels could make the market more transparent and thus allow consumers to better recognize, evaluate and reward eco-labelled products. Von Amstel et al. (2008) suggest that governmental requirements for clear and specific terminology, information of standardizations, and inclusion of production output stages, would diminish the number of labels on the market (ibid). Although such regulation could enhance eco-labels' reliability, only factor 2 expressed a positive attitude for such governmental involvement.

All factors perceived product-related information to be important. However, statements regarding the incorporation of environmental impact labels onto food products were valued relatively low. This can be understood as a consequence of the difficulties associated with estimating, integrating, and communicating such impacts (Goossens, et al., 2017; Thibert & Badami, 2011). Merit rankings, such as traffic light systems, were perceived as desirable by consumers due to their simple design and readability. However, only factor 2 found traffic light-systems useful, while factor 3 gave them the lowest score. This finding suggests that the sufficiency of environmental impact food labels differ between food product categories and likely depends on the number of ingredients and the complexity of the production methods. Hence, an emerging challenge is how to provide adequate, yet readable, product information that will allow consumers to compare products across different product categories and thus make credible choices. It is further questionable

whether labelled products would be able to compete in the market with products that are not labelled. A related question is whether eco-labels should be mandatory or voluntary, as it is unlikely that producers will voluntarily choose to label their products with a red light and risk losing profits.

Essential label elements to set incentives for ecosystem services
The findings revealed several statements of consensus which can provide a starting point for our understanding of what label elements are essential to set incentives for ES provision. These elements include product-related information, transparency, and the promotion of local ES. Initially, all factors perceived labels to have the potential to set incentives for ES provision within the agri-food production.

Communication about ES was believed to increase consumer awareness and help consumers better differentiate between sustainable products. A requisite, prominent form the findings, to create such awareness and enhance consumer understanding was that ES and products should be directly linked. Information on the products' environmental attributes was perceived as essential to allow consumers to assess the product's credibility and enable consumers to differentiate, evaluate and reward product attributes based on informed choices. Compensational initiatives such as Arla's net-zero ambition were described by several participants as misleading and should be avoided not to risk leading to greenwashing.

Consumers' assessment and acceptability of eco-labels further depends on whether they trust the environmental claims and rely on the labelling source (Janssen & Hamm, 2014; Taufique, et al., 2017). Previous studies have found that trust can be increased by third-party certification and transparent standardisations (Taufique, et al., 2019). The latter was valued high by all participants and can be understood as a vital requisite for a label's success. Transparency was described as desirable not only for providing consumers with adequate information but also for protecting company reputation and gaining competitive advantages in the shape of greater market support. Consistent with the literature, the factors valued third party certification as essential to reassure consumer confidence regarding compliance with labelling standards. However, not all participants agreed that certification would prevent greenwashing as such commitment is contingent on reliable label themes. The findings suggest that to set incentives for ES provision, labels should be transparent and based on reliable label assessments.

The perceptions of consumer's willingness to pay for eco-friendly products varied among the factors. Although there might be some degree of incentives to pay a price premium for environmental claims, it is questionable to what extent and further whether the premium charged can cover the cost increase of implementing the

ecosystem services. However, the findings revealed that different environmental services have different potentials to appeal to consumers. This emphasises the assumption of Chen et al. (2018): the importance of product differentiation and market segmentation (ibid). Literature findings suggest that claims of additional private benefits, such as health benefits, can increase consumers' willingness to pay for labelled products. However, private benefits were given a low score by all factors, indicating that more altruistic incentives, in general, drive Swedish consumers. Nevertheless, local produce seems to appeal to consumers in particular. As consumer preferences for eco-labels depend on the specific claims that are promoted (Chen, et al., 2018), promoting ecosystem services as "local" can be an effective strategy to convince a larger segment of consumers and thus increase incentives for ecosystem services.

Limitations

This study has several limitations. Although Q methodology was a useful approach to understand the variety of viewpoints on the topic, the results cannot be generalized to the larger population. By using a small sample size, the study could neither reassure that the understandings identified represent all possible viewpoints held within the sector. Applying the Q sort to a larger population might reveal new perceptions and form other independent factors. Further, was the stability of the study limited at an interpersonal level. For example, the participants did not review the statements before the interview and were thus given little time for reflection. It is possible that a longer time for such reflection would affect the Q sorting outcome. Because the study relied on interviews with representatives for organisations, the results do likely reflect personal views rather than implicit organisational perspectives. For instance, one participant had only been employed within the organisation for two months at the time of interview. Her viewpoint was likely influenced by previous experiences rather than by the organisation she represented. To some degree this would also apply to other respondents, and the ontological mismatch between the organisation as the unit of analysis and the interviewee must be kept in mind. To provide greater triangulation, future studies could, therefore, conduct interviews with different representatives within the organisations in addition to information derived from reports and public statements of the enterprise. The study's validity was also affected by the participants' understandings of eco-labelling and ES. The statements were open for interpretation and were thus perceived differently by different participants. However, in-depth interviews provided meaning and reason behind the Q sorting and allowed a rich and holistic interpretation of the study results. Therefore, the study findings discussed could provide a foundation for future, more generalizable studies to be built upon.

The perceptions could be correlated to company size, orientation, and position within the value chain, as comparable companies shared similar viewpoints. This imply that perceptions are related to context. However, due to the risk of revealing participants' anonymity, these correlations were not further analysed and discussed.

6. Conclusions

This final chapter presents the main conclusions of the study's results and provides suggestions for future studies.

This study has shown that there are diverse perceptions of eco-labelling among actors within the Swedish food sector. Eco-labelling is perceived as a prominent marketing approach to set incentives for ES provision by providing consumers with credible information, enhance transparency and reassure consumer trust. The results, however, have shown that eco-labels, at the present state, face challenges in communicating such adequate information and consumers are likely being confused by a large number of different label standards. The difference of opinion among the stakeholder groups imply that these challenges are complex with no easy one-fits-all solutions and might further explain the slow acceptance of eco-labels among Swedish consumers.

The study also revealed several consensus statements that can provide a starting point for our understanding of what label elements are essential to set incentives for ES provision. These elements include product-related information, transparent and reliable label standards and promotion of local ES.

The results of this study add to the expanding field of research on eco-labelling and may provide a foundation for future studies on the development of incentives for sustainable consumption and production.

Although the current study was based on a small sample of participants, the findings suggest that perceptions of eco-labelling are contextual. As Q-study results cannot be generalized to a larger population, future research could validate the findings through a quantitative survey with a larger sample of food processors. It would also be interesting to repeat the study in a different sector or a different cultural context. This approach could inform us on the sensitivity of the findings to these factors. Repeating this study, using a broader range of stakeholder groups, could shed light specifically on the issues associated with eco-labelling among different value chain actors. Consumers in particular have not been part of the present study. Whether consumer awareness and attitudes of ES are matched by other actors' beliefs is

critical for label performance. The consumer perspective could also be tackled through other marketing research methods, e.g., valuation studies. Government regulation of labels is another interesting route for future research. To understand better the optimal number and design of labels from a broader social welfare perspective would affect the boundaries under which private sector label development could take place.

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Appendix 1: Q interview instruction

Stort tack för din medverkan!

Denna intervju syftar till att skapa förståelse för hur märkningar kan användas för att främja eko-systemtjänster inom livsmedelsproduktionen. Intervjun är en del i mitt examensarbete vid Sveriges Lantbruksuniversitet och kommer vidare ligga till grund för en omfattande konsumentundersökning som utförs inom det EU-finansierade projektet Contracts2.0.

Contracts 2.0 är ett tvärvetenskapligt forskningsprojekt som undersöker befintlig (och testar ny) kontraktsdesign gentemot lantbrukare i syfte att främja eko-systemtjänster inom det europeiska jordbruket. Projektet leds av Prof. Bettina Matzdorf vid Leibniz-Centre for Agricultural Landscape Research (ZALF), Tyskland. Du kan läsa mer om projektet på www.project-contracts20.eu

Målet med intervjun är att ta reda på vilka aspekter av livsmedelsmärkningar som anses relevanta för konsumenter och ämnar avspegla dina erfarenheter och tankar kring ämnet. Under intervjun finns inga "rätt" eller "fel". Det är din personliga åsikt som är viktig. Dina svar kommer anonymiseras och behandlas konfidentiellt. Ditt namn kommer inte kunna kopplas till resultaten som presenteras i studien.

Inför intervjun har vi adresserat fem områden som berör livsmedelsmärkningar:
- Design
- Kommunikation
- Konsumentens roll
- Miljöprestanda och produkt
- Ekonomiska konsekvenser

Utifrån områdena har vi formulerat 45 påståenden. Din uppgift blir att ranka påståendena på en skala efter hur väl du håller med om dem relativt varandra. Genom denna metod kan vi senare jämföra dina svar mot andra svarande och så småningom se mönster och extrahera gemensamma åsikter och perspektiv.

Intervjun kommer ske via den digitala plattformen Zoom och rangordningen kommer ske med hjälp av ett program som tagits fram i samarbete med ZALF särskilt för denna intervju. Intervjun förutsätter att du har tillgång till dator och kan inte ske via telefon.

Intervjun kommer gå till enligt följande:
1. Vi går först igenom påståendena tillsammans och du uppger om du håller med, inte håller med eller har en neutral åsikt gentemot dem. Vi diskuterar påståendena i mer detalj och du uppmuntras att uttrycka egna reflektioner och tankar.
2. När alla påståenden blivit kategoriserade ska du bearbeta varje kategori, en i taget, genom att rangordna påståendena på en skala efter hur väl de stämmer överens med din åsikt. Skalan består av 45 rutor, från +5 (håller med helt) till -5 (håller inte med alls), där 0 är neutralt. Du kan placera ett påstående per ruta.
3. När du känner dig nöjd med fördelningen ber jag dig diskutera rangordningen och resonera kring motiven bakom den.
4. Slutligen ombeds du besvara några generella frågor om din tjänst, din bakgrund och om din organisation.

Med vänlig hälsning,

Lina Larsson

Appendix 2: Consent form

Samtyckesblankett för insamling och bearbetning av personliga intervjudata

Forskningsprojekt:	Contracts2.0 – Innovativa kontraktsmodeller f miljöåtgärder inom livsmedelsproduktionen
Genomförande institution:	Sveriges Lantbruksuniversitet (SLU), Almas Allé 8, 750 07 Uppsala, Sweden
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Kontaktperson:	Prof. Bettina Matzdorf, matzdorf@zalf.de
Intervjuare:	Lina Larsson, liln0005@stud.slu.se
Datum:	16.11.2020

Stort tack för er medverkan. Ert deltagande är frivilligt och ni kan närsomhelst avbryta er medverkan utan att ange orsak. För att enklare kunna bearbeta era svar önskar vi spela in intervjun. Studien kommer att presenteras i skrift och samtliga intervjuer kommer att anonymiseras i enlighet med ZALF-riktlinjerna för hantering av forskningsdata och EU:s GDPR (art 6.1 a).

- Kan intervjun spelas in?   ja ☐   nej ☐

Mot begäran får ni ta del av en kopia av inspelningen.

- Vill ni kontrollera intervjutexten innan publicering?

                        ja ☐   nej ☐

Innehållet i intervjun hanteras konfidentiellt och uteslutande för vår forskning. Inga personliga eller företagsspecifika uppgifter skickas vidare eller publiceras. De anonymiserade intervjuerna och analysfilerna sparas av forskarna på krypterade datafiler. Personlig kontaktinformation lagras separat från intervjudata och är otillgänglig för tredje part. De insamlade uppgifterna lagras i 10 år i enlighet med reglerna för god vetenskaplig praxis i Leibniz Association och raderas sedan.

    Underskrift intervjuare   Underskrift medverkande

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