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## Finnish consumer perceptions of carbon footprints and carbon labelling of food products

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### ABSTRACT

The aim of this study was to explore how Finnish consumers perceive the communication of carbon footprints for food products. The study comprised five semi-structured focus groups and an online-survey of 1010 respondents. The study showed that the term 'product carbon footprint' is familiar to many, but there is substantial misunderstanding of its meaning. Only 7% of the respondents linked 'product carbon footprint' spontaneously to greenhouse gas emissions associated with the product and an additional 5% of the respondents linked it to climate change. There are positive attitudes towards carbon labels, 90% stated that a carbon footprint would have at least a little impact on their buying decision, but the information became meaningful only when many other purchasing criteria (such as price and taste) were satisfied. Furthermore, 86% preferred carbon labels that allow comparisons of carbon footprints to be made among food products, but there is divergence on perceived needs for carbon label content.

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### 1. Introduction

It is known that food production and consumption have a significant impact on the environment. About 40% of the earth's land area is used for agriculture (Foley et al., 2005). Additionally, agriculture generates substantial nitrogen and phosphorus emissions in addition to greenhouse gas emissions (GHG-emissions). By 2050, the human population is expected to reach 9–10 billion, and thus there will be over two billion more mouths to feed (UNEP, 2010). Due to population growth, the demand for food is projected to increase and thus the environmental impacts of food, including the climate impact resulting from food production, are expected to increase in the future.

In Finland around 25% of GHG-emissions and the largest proportion of the phosphorus and nitrogen emissions from private consumption originate from the production and consumption of food, including household food preparation, food preservation, journeys to shops and meal services (Regina et al., 2011; Seppälä et al., 2009). While other consumption groups, especially transportation and housing, also have a high impact on the environment (Regina et al., 2011; Seppälä et al., 2009, 2011; Tukker and Jansen, 2006), food represents an exceptional opportunity for consumers to reduce their personal impacts as well as the possibility to make

'day-to-day' choices and exercise a high degree of personal choice (Hertwich, 2005). Additionally, communication of the environmental impacts of food products is highlighted by there being an absence of significant opportunities to contribute solely by adopting low carbon technology (Weidema et al., 2008). Therefore, while such technologies are indisputably needed, there is potential for reducing emissions from food consumption by modifying consumer behaviour. It is possible to reduce one's food consumption related environmental impact, including climate impact, significantly by altering consumption patterns for food products (e.g. Carlsson-Kanyama and Gonzalez, 2009).

Some studies indicate that Finnish consumers are interested in information on the environmental impacts of food. For instance, according to the Climate Focus Nordic study, up to one third of Finnish consumers would be willing to take environmental sustainability in their own food choices into account (Raisio, 2011a). However, according to the Eurobarometer survey of 2009, a large proportion of Finnish consumers (55% of the respondents) believe that they know little or nothing about the environmental impacts of food (European Commission, 2009). One way to inform consumers about the environmental impacts of food is environmental labelling. Packaging labels provide information on product characteristics and guide consumers. In 2009 Eurobarometer asked what type of environmental labels Finnish consumers preferred. Among labels for recycle/reuse, confirmation on environmentally friendly source, confirmation of eco-friendly packaging and total amount of GHG-emissions created by the product, the

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GHG-emissions created by the product type, essentially a carbon label, was least popular, gaining the support of only 8% of the respondents (European Commission, 2009).

While the Eurobarometer shows that carbon labels did not get much support among Finnish consumers in 2009, one should keep in mind that the more preferred recycle/reuse label and eco-friendly packaging labels only take into account the packaging – not the food item itself. Moreover, there are no labels on Finnish food packages that take into account several environmental impacts of the food product, and thus verify that the product is from an environmentally friendly source. Actually, this type of environmentally friendly source label on food packages is rather rare at the international level, while there have been several attempts to introduce environmentally friendly source labels on food packages (e.g. Nordic Ecolabelling). Meanwhile, carbon labelling of food products expanded steadily in Finland after 2009. The first carbon label appeared in 2008, and to date seven Finnish food companies include carbon labels on their product packages. Overall, more than 40 Finnish food products are now carbon labelled and more will be labelled in the future. Different stakeholders in the Finnish food industry (industry, primary producers, retail, government, non-governmental organizations etc.) have also discussed actively the prospects for communicating climate impacts of food. To date there is consensus that it is important to proceed together in this matter and it has been agreed that several different carbon labels will confuse consumers (Hartikainen et al., 2010).

While carbon labelling has increased over recent years and different stakeholders in the food industry have discussed the issue actively in Finland (Hartikainen et al., 2010, 2011), the reality is that there is a lack of information on Finnish consumers' current desires for information on climate friendly food products. For instance, in a UK study 89% of the respondents were confused about carbon labelling (Gadema and Oglethorpe, 2011), and therefore it is assumed that carbon labels could cause some confusion also among Finnish consumers. All in all, there is growing demand for understanding Finnish consumer perceptions of carbon labels, attitudes towards climate-friendly products, and whether or not consumers seek information on climate-friendly food products.

## 2. Materials and methods

There is a growing amount of carbon labelled food products in Finnish food stores and several stakeholder discussions on prospects of communicating climate impacts of food have taken place. The assumptions in this study are that carbon labels are not fully understood by consumers and that there are mixed interests in carbon labelling of food products. Therefore, in this consumer study we focused on establishing the extent of:

- 1) Consumer *understanding* of the message transmitted by product carbon labels
- 2) Consumer *interest* in carbon labelled food products

The consumer study was bipartite, with results from five semi-structured focus groups and from an online questionnaire with 1010 respondents. By using two different research methods it was possible to determine whether results varied depending on the used research method. Additionally, the focus groups preceded the online survey so that the online survey could be revised if there were any need for further information and/or changes in the questions and study structure.

Both the focus groups and online survey were structured in a stepwise design, starting with more general questions about food and leading towards more specific questions on carbon labelling of food products. With a stepwise design it was possible to lead

respondents to the subject matter and gather important information on contexts, such as how important a criterion environmental friendliness is when grocery shopping and how consumers understand product carbon footprints. Additionally, stepwise design was considered appropriate because although there are increasing amounts of carbon labelled food products, labelled products are in a clear minority, and thus the assumption was that carbon labels on food products are still relatively unknown to the majority. Moreover, in order to study the current level of understanding, the respondents were given only a little information on carbon footprints.

### 2.1. Sample

#### 2.1.1. Focus groups

There were five semi-structured focus groups, including 33 participants in total. The key criterion for participant recruitment was that the participant stated that environmental friendliness was at least somewhat important when grocery shopping (by giving a score of at least 3 on a scale of 1–5, 5 being very important and 1 not important). The participants were grouped according to their ages. There was a group of young adults (ages 24–28), two adult groups (ages 31–44) and an elderly group (ages 53–65). The members of a fifth group (ages 28–47) were more environmentally conscious on average than other focus groups when grocery shopping (by giving a score of at least 4 on the scale of 1–5). In this paper the fifth focus group is reported as the 'pro-environmental focus group' and other groups are termed 'fairly pro-environmental focus groups'.

#### 2.1.2. Online survey

The respondents for the online survey were selected through a respondent panel. Altogether, 4000 respondents were invited to respond to the survey, of which one third started the questionnaire. In total 1010 respondents completed the questionnaire, and thus the interrupt percentage was rather low: only 20%. All respondents were invited on to the panel solely by informing that the questionnaire was about food and food choices. This was done to reduce the possibility of having special interest respondents, such as having more environmentally conscious respondents than exist on average. While this procedure reduced the number of more environmentally conscious respondents, it is probable that some respondents answered according to the way they thought they ought to answer or possibly according to how they wished to act (respondent bias). Therefore, the results regarding stated interest in carbon labels and expressed interest in buying carbon labelled food products should be treated cautiously. In future a more focussed study, for instance a follow-up study (e.g. Vanclay et al., 2011) could be appropriate to secure a more reliable picture of consumers' interest in the issue.

The socio-demographic characteristics of the respondents were close to Finnish population averages, although adult households were somewhat overrepresented and single households underrepresented (Table 1). Additionally, all the respondents were between the ages of 18 and 65. Some other relevant socio-demographical characteristics of the data, county of residence and occupation for instance, were also studied, but no major distortions in comparison with Finnish population averages were established.

### 2.2. Study structure

#### 2.2.1. Focus groups

Each focus group discussion lasted about 2 h: first the participants discussed their own criteria for grocery shopping, then they discussed how environmentally conscious they were in general and how their consciousness related to food consumption. Groups also debated the main environmental burdens of food. Lastly, the groups discussed carbon footprinting and carbon labelling of food

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