



## Communicating the environmental impact of meat production: challenges in the development of a Swedish meat guide



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### ABSTRACT

Environmental impacts from food consumption are dominated by the consumption of livestock products. Changes in consumption patterns are necessary to reduce these impacts. Information is a policy instrument that can influence consumers to make more sustainable choices, as well as increasing awareness of the problem and hence creating acceptance for financial policy instruments, e.g. taxes. Environmental studies of livestock often focus on greenhouse gas emissions. Although the carbon footprint of meat correlates with several other impact categories, there is a risk of conflicts with categories such as biodiversity loss, pesticide use and animal welfare. In an interdisciplinary project, a consumer guide was developed to assist Swedish consumers and food professionals at retail level in making less environmentally harmful meat choices and to act as a communication tool, raising awareness of the different environmental aspects of meat production and potential conflicts with animal welfare. A series of design requirements were established for the guide as regards communication and environmental assessment from a life cycle perspective. Following these, four indicators (carbon footprint, biodiversity, use of pesticides and animal welfare) were chosen to represent the impact on the environment and animal welfare from different choices of meat and other protein sources. For each indicator, criteria were developed that placed the products included in the meat guide in one of three different groups, represented by the well-known traffic light system of red/yellow/green. This first attempt to develop a meat guide for the Swedish market has several limitations, but should provide valuable guidance to consumers and can act as a basis for discussion in the important task of decreasing meat consumption and choosing better meat alternatives.

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### 1. Introduction

Environmental impacts from food consumption are dominated by the consumption of livestock products (Weidema et al., 2008). These impacts can be reduced through improvements in production practices, such as increased nitrogen use efficiency and carbon sequestration in soils (Smith and Gregory, 2013). An alternative way to tackle the environmental problems of meat production is through changes in consumption patterns. Several researchers argue that the consumption of livestock products in the Western world needs to decrease (Garnett, 2011; Smith and Gregory, 2013; Weidema et al., 2008).

A distinction can be made between 'weak' and 'strong' sustainable consumption. According to Fuchs and Lorek (2005), increased efficiency of consumption through, for example,

technological improvements is necessary but not sufficient for moving towards sustainable consumption. Instead, Fuchs and Lorek (2005) advocate what they refer to as 'strong sustainable consumption', namely 'changes in consumption patterns and reductions in consumption levels in industrialized countries'. The issue is also addressed by Pereira Heath and Chatzidakis (2012) but from a marketing perspective and with a distinction between 'green marketing', which advocates continuous consumption but of 'greener' products, and 'sustainable marketing', which challenges the existing dominant ideology of consumption in Western industrialised countries. Several policy instruments are available for bringing about changes in consumption patterns, e.g. subsidies or price regulation, information campaigns or taxes, as advocated by Wirsenius et al. (2011). Although financial policy instruments are probably needed for 'strong' sustainable consumption, informing consumers and hoping for their voluntary engagement is less contentious, cheaper and easier to introduce (SBA, 2013). Information about the environmental impact of livestock production is also necessary for increasing understanding of the problem and

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hence creating acceptance for more potent policy instruments, e.g. taxes.

From a consumer perspective, it is not easy to know what to buy in order to make a less environmentally harmful food choice. The focus has long been on organic food production, which is the main alternative for the environmentally conscious consumer. Organic food products are labelled with, for example, the EU symbol denoting organic production or other similar 'eco labels'. It is reasonable to assume that at best, the existing eco labels might be helpful when making 'greener' choices within a particular product group, e.g. organic beef, rather than in making choices across product categories and types, e.g. replacing beef with legumes or chicken. Moving beyond 'weak' sustainable consumption and 'green marketing', there is a need for a new approach for communicating and helping consumers to make less environmentally harmful food choices.

With increasing interest in other sustainability issues, such as fair trade and climate change, new labels have been introduced. An example of efforts to apply a labelling system for greenhouse gas (GHG) emissions is the Tesco Carbon Footprint Labelling campaign to assist consumer choices (Boardman, 2008; White et al., 2007). This was an ambitious programme in which individual products were labelled with a symbol and a numerical value for GHG emissions, i.e. the carbon footprint (CF) (Park, 2009; Upham and Bleda, 2009). This type of labelling scheme, presenting a number for actual GHG emissions, provides the consumer with a way of carrying out 'strong', sustainable consumption by enabling comparisons between different types of products. However, although the initiative was praised by the media, it was abandoned because it was too costly, difficult to manage and difficult for consumers to understand (Guardian, 2012). Other challenges with the carbon footprint system are summarised by Rööfs and Tjärnemo (2011).

The Tesco labelling initiative focused on the release of GHG, as is often the case when it comes to the environmental impact of meat production (Steinfeld et al., 2006; Gerber et al., 2010; Leip et al., 2010). However, a focus on low CF of meat can be in conflict with categories such as biodiversity loss and pesticide use (Rööfs et al., 2013). In addition, focussing on reduced emissions of GHG risks decreasing animal welfare and increasing the use of antibiotics. Hence to minimise the risk of pollution swapping, information used for communicating sustainable eating habits should not be limited to the CF, but should also consider other environmental aspects.

Research on communication strategies for sustainable food consumption that link scientific knowledge to consumer behaviour is scarce and there is a need for a multidisciplinary approach to stimulate the consumption changes required to mitigate climate change. Therefore this project sought to develop a consumer guide that could assist Swedish consumers and food professionals at retail level in making less environmentally harmful meat choices and that could also act as a communication tool, raising awareness of the different environmental aspects of meat production and potential conflicts with animal welfare. The purpose of this paper was to describe how the guide was designed, discuss the difficulties in conveying complex environmental information to consumers in an understandable way and highlight research needs in the area.

## 2. Methods

### 2.1. General methodology

The challenge of developing a science-based meat guide for interested consumers was tackled in this interdisciplinary project from a life cycle assessment (LCA) perspective and a communication perspective simultaneously. The overall aim was to develop a way of providing information about the complex environmental

impacts of meat production, as described by scientific models from physics and biology, in a way that was understandable to non-experts and that would stimulate choices drastically reducing the environmental impacts. Hence, the guide was built within the framework that consumers with a pro-environmental attitude will make informed and active choices when they are confronted with trustworthy and understandable information (Fishbein and Ajzen, 1975). When it comes to the environmental information to be transmitted to consumers, a holistic lifecycle-based approach was adopted in order to avoid pollution swapping. Initially, the focus was purely on the environmental impacts of meat production, as opposed to a more complete sustainability assessment including economic and social aspects. However, the aspect of animal welfare was added at an early stage as it was identified as an area of utmost importance for the end users of the guide.

Based on the above, a set of design requirements was devised in an initial workshop involving the research group and representatives from the retail sector and NGOs. These basic requirements were: 1) to target the guide at a specific group rather than all consumers; 2) to develop a guide that could act as a communication tool and stimulate discussion about meat production and consumption in the Western world; 3) to base the guide on scientifically accepted and existing data; 4) to guide consumers not only between different types of meat, but also alternatives to meat; 5) to compare products from a lifecycle perspective related to 1 kg of edible product; 6) to give guidance based on the CF but also other environmental parameters and animal welfare; and 7) to use existing certification schemes and control programmes to evaluate products. Hence, the ambition was to design a tool that would communicate the current state of scientific knowledge as regards aspects of meat production based on what can be known to consumers in a retail setting. For example, if meat type A is known to be generally superior to meat type B and there is a way for the consumer to differentiate meat type A from meat type B in the supermarket, information on the superiority of meat type A should be given to the consumer.

Requirements (1) and (2) relate to the communication perspective and are further discussed in Sections 2.2 and 2.3. Requirements (3) and (7) relate to the need to provide a guide now, rather than in 10 years. There is great uncertainty and variability in the CF of food products (Rööfs and Nylander, 2013) and it is easy to get the impression that no general rules can be given with any certainty. However, some findings are rather unambiguous in the existing literature, e.g. beef meat has a larger CF than meat from monogastric animals due to methane emissions from enteric fermentation (unless substantial carbon sequestration in soil takes place in pastures and ley cultivation, see Section 3.3). Such information can be presented to consumers, while differentiation between the CF of beef meat from organic or conventional production systems in general is impossible based on existing literature (Cederberg et al., 2011). As a result, one of the design requirements for the guide was that it should provide information about differences in CF between beef meat and meat from monogastric animals, but not between organic and conventional beef meat. Requirement (4) related to the aim to stimulate consumers to take measures that have large potential for reducing emissions (Section 2.4). Requirements (5) and (6) arose from the fact that LCA is the generally accepted methodology for comparing the environmental impact of products with the aim of preventing pollution swapping. Swapping can otherwise occur if the entire product lifecycle is not included or if only one environmental aspect is included. However, the use of 1 kg of product as a basis for comparison was not a clear-cut decision, as is further discussed in Section 2.4.

Based on these requirements the guide was developed mainly through discussions in the research team. Different proposals were

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