Reducing householders' grocery carbon emissions: Carbon literacy and carbon label preferences

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ABSTRACT

Government and industry are increasingly calling upon households to lower their carbon emissions through improved consumption choices. Grocery products, because of their high volume, are a significant contributor to emissions and have become a focus for behaviour change efforts. Yet the assumption that the consumer knows, cares and can comprehend the information they are given in a carbon label is yet to be empirically established as consumer carbon literacy and perceptions of carbon label designs are not yet well researched.

This paper finds that Australian householders have low pre-existing carbon knowledge and are consequently poor at identifying high carbon emitting grocery products, unaided. This suggests a role for on-pack carbon labels to assist at-shelf choices. However, given the quick and habitual nature of grocery shopping, a significant challenge lies in how best to communicate emissions for consumer cut-through and awareness. Testing of competing carbon labels finds that householders give highest preference ratings to formats that show emissions relative to other products, rather than stand alone, and for ones that use the traditional traffic light colour system. Governments, manufacturers, and marketers can use these findings in their efforts to raise consumers' carbon literacy and encourage more informed grocery carbon emission choices.

1. Introduction

Household carbon emissions have a significant effect on the environment (Post et al., 1990; Symons et al., 1994) and contribute to global warming (Pearce, 1991). The increasing focus on climate change as a major environmental concern (Roy et al., 2007) has seen both public and private sector efforts to reduce these emissions. Initiatives range from incentives to increase the uptake of renewable energy sources, the introduction of a carbon tax, through to the encouragement of changed consumption behaviour. The focus on changes in consumption behaviour is especially sensible, given household carbon emissions have been estimated at approximately a third of total carbon emissions in the UK (Roy et al.,) and US (Dietz et al., 2009) and that behavior change could lead to a significant reduction in these totals (Dietz et al., 2009). Groceries in particular are implicated in a significant proportion (about one third) of the total environmental impact and emissions arising from EU economies, justifying a focus of efforts on household behavior change in relation to high volume grocery products (Upham et al., 2010).

However, in order to make more informed grocery carbon choices, householders require either pre-existing knowledge, or to be provided with information, about the carbon implications of their behaviours. Carbon labelling is one way of providing such information through stating via an on-pack label, the carbon emissions associated with the lifecycle of that product (Upham et al., 2010), thus making transparent to the consumer the carbon emitted through their grocery choices (Albert, 2010; D'Souza et al., 2006). Having such information available at point of purchase enables even those with low carbon knowledge to make informed carbon consumption decisions (Leire and Thidell, 2005); removes a potential behavior change barrier; and helps consumers to more easily reduce their carbon consumption (Beattie et al., 2010), while lowering the search costs for the already carbon literate (Rutz et al., 2007; Stokes et al., 2010; Teisl et al., 2002). Panzone et al. (2010), through a simulated shopping exercise, found carbon labelling to be the most viable mechanism to reduce household grocery carbon emissions, aside from removing the highest carbon emitting product categories entirely. Upham et al. (2010) estimate that individual carbon consumption could be reduced by up to one tonne per year, per consumer, under a successful carbon labelling scheme; but the authors also note that these results are illustrative rather than predictive.

Certainly, a key challenge for carbon labelling is that, in order for carbon labels to be used by consumers in their purchase

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decision making process, the labels need to be noticed, understood (Leire and Thidell, 2005), trusted, and valued as a decision making tool (Thogersen, 2000). Consumer comprehension of such labels is also dependent on the extent to which the label is seen as clear in its meaning, as well as the consumer's knowledge of the label and their ability to interpret it (D'Souza et al., 2006). Eye tracking research found that carbon labels on products are seen in some product categories but simply not noticed in others and therefore, not used in the consumer's purchase decisions (Beattie, 2009), highlighting a need for research to look at ways to make labels more salient to shoppers. Additional to labels not communicating well with consumers, is the potential problem of the consumer lacking sufficient carbon literacy to be able to interpret the information given. Indeed, many of the label formats have been criticised for a lack of consumer comprehensibility (Quack et al., 2010). Currently more than 20 different carbon labels are in use globally and many of these operate within the same markets (Tan, 2009). On top of the already existing range of environmental and ethical on-pack labelling, this gives rise to an environment of over-proliferation and shopper confusion.

This paper contributes to the literature through identifying householders' pre-existing level of carbon literacy and hence the scope for carbon labels to assist in low carbon consumption grocery choices. Additionally housholders' perceptions of key competing carbon label designs are examined to identify those with the most chance of consumer cut-through. Finally, these findings are put in the context of existing marketing science knowledge of in-store shopper behavior, thereby identifying the role that such on-pack labelling can realistically be expected to perform.

2. Background

2.1. Known patterns in householder grocery shopper behaviour

Assisting quick and easy consumer comprehension is vital given the habitual and low-involvement nature of grocery shopping (Winter and Rossiter, 1989; McDonald and Ehrenberg, 2002). An average supermarket consists of 40,000 different products, yet consumers are still able to complete their shopping in a matter of minutes (Sorensen, 2009a,b). This is because an average consumer purchases quickly and automatically. The majority of different brands in any particular category are simply screened out, with consumers rarely adding to their existing repertoire of purchased brands (Sharp, 2010). This reduced brand choice saves consumers from having to constantly re-evaluate their choices every time they buy (Ehrenberg and Uncles, 1995; Sharp, 2010). However, this raises a significant barrier for behavior change efforts at-shelf. The label and its ability to communicate becomes critical given the speed of product choice. The simple addition of extra information to a product's packaging, such as a carbon label, may not be enough to catch the consumer's attention and get them to consider a new brand option and an additional purchase criteria (i.e. being low in carbon). That said, having a carbon 'story' is news for a brand and, given most brands in a category are easily seen as substitutes for each other, this is rare (Sharp and Newstead, 2010). Such news may be a useful point from which to catch consumer attention and gain consideration. Yet the assumption that the consumer knows, cares and can comprehend the information they are given in a carbon label is yet to be empirically established as consumer carbon literacy and perceptions of carbon label designs are not yet well researched in marketing (Upham et al., 2010). However, exploratory findings concluded that carbon labels may only ever be used by a small proportion of the market because carbon information is difficult to meaningfully normalise and communicate (Upham et al., 2010).

2.2. Shoppers' existing carbon literacy

Grocery product carbon emissions generally differ more between product categories than between brands within the same category (Jones et al., 2008; Saunders et al., 2009) and fresh products generally produce less carbon than canned or frozen versions of the same (SMEC, 2011; Kramer et al., 1999). Many such carbon emission level differences, both within and between categories, are logical, such as vegetables and fruit contributing less carbon to the atmosphere than meat, due to the grain fed to the animals (Kramer et al., 1999).

Prior knowledge plays an important role in message comprehension, as existing understandings are used to make sense of current information (Murphy and Mason, 2006). So, the extent to which environmental considerations, such as the carbon emissions of products, can be considered in the purchase decision making process of consumers will be dependent on the level of knowledge that they hold in relation to the issue (Roy et al., 2007; Young et al., 2010; The Radio Advertising Bureau, 1983). It may be that carbon literacy is so low amongst consumers that they are unaware of even these simple, logical carbon emission differences and so cannot include this information in their purchase decision (Moisander, 2007; D'Souza et al., 2006; Murphy and Mason, 2006). Such an inability to distinguish between high and low carbon emitting products has been cited as the initial barrier to consumers being able to purchase low carbon products (Tanner and Wolfing Kast, 2003; Beattie et al., 2010; Murphy and Mason, 2006).

Recent research assessing consumers' level of carbon literacy has found it to still be generally low, even for basic concepts, with a significant proportion of people unaware that they produce carbon emissions at all and high levels of uncertainty as to which activities create more greenhouse gas emissions than others (Sharp and Hoj, 2009). Indeed knowledge has been found to be so low that that the majority of consumers would find it difficult to make an informed purchase decision without the provision of additional information (Saunders et al., 2009), suggesting a potential role for on-pack carbon labels.

Even in markets such as the US, where carbon labelling is more established, research has found consumer difficulty in discriminating between high and low carbon emitting products and a current lack of awareness as to the carbon emissions produced by consumption choices. However, after enhancing the knowledge of consumers with carbon emission training, a significant increase in levels of carbon knowledge was seen (47% initial average accuracy, increased to 76% average accuracy), suggesting that with additional carbon information, consumers may be able to better decipher the low carbon options in the market and make more informed carbon consumption choices (Wakeland et al., 2009).

From these findings, it could be argued that, if carbon knowledge is low, carbon labelling may be a good method by which to increase the carbon knowledge of consumers (D'Souza et al., 2006; Saunders et al., 2009). Although, carbon labels themselves still require a base level of carbon knowledge to be understood (Boardman, 2008; D'Souza et al., 2006; Saunders et al., 2009) and to be actively used in purchase decisions (Nartova, 2009; Saunders et al., 2009).

2.3. Lessons from other label schemes and existing knowledge of carbon label preferences

Providing nutrition labels on products helped increase originally low nutrition knowledge held by consumers, providing them with enough information to include nutrition as a criteria in their purchase decisions (Möser et al., 2010; Godwin et al., 2006). It could be argued that the same can occur with carbon emissions and grocery choices. In support of this, prior research (see Janssen