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Sustainable Development and the Consumer: Exploring the role of Carbon Labelling in Retail Supply Chains

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Sustainable Development and the Consumer: Exploring the role of Carbon Labelling in Retail Supply Chains

Key words: eco-labelling, retailing, loyalty card data, sustainable purchasing behaviour

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For Peer Review

ABSTRACT

This empirical article contributes to the sustainable development debate by examining consumer responses to carbon labels within a real world context. Given the limitations of methodologies that use self-reported or intended measures of purchasing behaviour, we use the loyalty card data of the largest supermarket retailer in the UK to measure the impact of carbon labels on sales by different consumer segments. The data show that the trial of carbon labels on supermarket own brand products have had no discernible impact on shifting demand to lower carbon products. In order to explore possible reasons behind this lack of impact, nine focus groups were carried out using purposive sampling by retailer consumer segments to allow an exploration of awareness, understanding and use of carbon labels. The findings from the focus groups identified possible reasons behind this lack of impact: lack of awareness and understanding of carbon labelling; constraining or facilitating social and cultural influences, and the heterogeneous nature of consumers. As a result, a number of implications for stakeholders are discussed.

Introduction

The relationship between current human behaviour and the sustainability of our planet for future generations is a hotly contested topic. Global threats caused by human behaviour to public health, the environment, agriculture, equity and the economy (Kim and Neff 2009) are of great concern to governments, industry and consumers (IPCC 2007; Stern 2007). In particular, the major source of such threats has been identified as the unsustainable pattern of consumption and production in industrialised countries (UNEP, 2001). As a response, there have been calls for changes to human consumption behaviour in order to reduce atmospheric greenhouse gas concentrations considered to impact on changing climate patterns (Bagozzi 2000; Mick 2006, 2008; Goldstein et al. 2008). Over time, external and internal factors have led organisations to consider a range of strategic responses to the issue of climate change, not just at the firm level, but including upstream supply chains and down stream customers (Walker and Jones, 2012, Lee 2012, Gimenez and Tachizawa 2012, Sprengel and Busch 2011, Pinkse and Kolk 2010). Perceived demand is a key driver, with the general assumption that consumers can contribute to these efforts by making 'sustainable' consumer choices, provided they have the information to inform such choices.

The social and environmental impact of a product cannot be evaluated by consumers before purchase, or experienced post purchase, and labelling is frequently used as a means to overcome information asymmetry throughout the supply chain (Thompson et al. 2010, van Amstel et al. 2008, Sammer and Wüstenhagen 2006). Eco labelling attempts to communicate information to consumers regarding the environmental externalities of global production, with the

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2
3 assumption that concerned consumers can make comparisons, and give preference
4 to products or services that have less environmental impact (Schepers 2010; Smith
5 et al. 2010; Gertz 2004).
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10 Carbon labels (or 'carbon reduction labels') are the end result of a complex and
11 controversial process designed to increase transparency regarding emissions, and
12 involves carbon measurement, footprinting and labelling of a particular product along
13 the supply chain (Brenton et al, 2009). Carbon labelling is in its infancy, and has to
14 date been confined to trials and pilot projects involving the auditing and labelling of
15 limited ranges of consumer products (Hartlieb et al. 2009). France, Germany, Japan
16 and Korea are examples of countries engaging trial schemes on limited product
17 ranges, whilst Tesco, the UK's largest retailer, has trialled carbon labelling on a
18 limited number of own brand grocery products (McKinnon 2010) as part of their
19 sustainability strategy, the objective of which is to reduce overall carbon emissions
20 along the supply chain. Early research exploring consumers' understanding,
21 attitudes and intentions towards the theoretical concept of carbon labelling has been
22 mixed (Wheatland 2007; Gadema and Oglethorpe 2011).
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41 Therefore, one of the major unknowns in the current debate about the effectiveness
42 of carbon labelling is the behavioural response, and the extent to which demand has
43 shifted to lower carbon products (McKinnon 2010; Thøgersen et al. 2010). Previous
44 research into sustainable purchasing behaviour has been criticised for an over
45 reliance on self-reported or intended behaviour measures (Schwepker and Cornwell
46 1991; Shrum et al. 1995; Robinson and Smith 2002; Selfa et al. 2008; Vermeir and
47 Verbeke 2008) rather than using actual behaviour data. Such methods are inherently
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3 inaccurate due to flawed recall and social desirability bias (Burgess et al. 2003;
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5 Carrington et al. 2010).
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10 Given this research gap, our study aims to examine consumer responses to carbon
11 labels within the real world context (Andorfer and Liebe, 2012). In the UK, food
12 retailers are identified as being at a mature stage in responding to sustainability
13 issues (Isles, 2007), with consumers being identified as particularly influential drivers
14 of corporate responses to climate change (Heikkurinen and Forsman-Hugg, 2011,
15 Sprengel and Busch 2011). However, empirical research examining sustainability
16 initiatives by food retailers and insight into consumer behaviour with regard to
17 sustainable purchasing behaviour is lacking (Chkanikova and Mont, 2012, Pinkse
18 and Kolk 2010). Even more importantly, there is a need to examine the impact of
19 sustainability initiatives by food retailers (Hampl and Loock 2013). The trial of own
20 brand carbon labelled products by Tesco, the third largest supermarket in the world,
21 and the largest supermarket in the UK, offers a unique opportunity to empirically
22 investigate the impact of carbon labels within product categories, using customer
23 loyalty card data to track actual purchasing behaviour. In order to explore the role of
24 carbon labelling further, a series of focus groups were held to gain an appreciation of
25 current levels of awareness, understanding and use of carbon labelling within the
26 context of the Tesco trial.
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49 The article begins by exploring the literature on sustainable consumption. We
50 discuss eco labelling in general, and then describe the current situation regarding
51 carbon labelling. We then explain and justify our methodological approach, and
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3 present the findings of our exploratory research. Finally, we discuss the implications
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5 of the findings and identify further avenues of research.
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8 9 **Sustainable Consumption**

10 Seyfang (2005) discusses the contested nature of the term “*sustainable*
11 *consumption*”, and notes that over time, governments have adopted the dominant
12 model of market failure as the prime cause of unsustainability. As a result of this
13 perspective on sustainable consumption, governments have focused on changing
14 consumption patterns rather than reducing consumption volumes, through market
15 based measures such as taxes, tariffs, public sector purchasing policies, education
16 and social marketing campaigns, and voluntary eco-labelling schemes. The objective
17 is to influence producers to be more eco efficient and offer consumers more choice in
18 terms of ‘green’ products (Seyfang, 2005). In response to external and internal
19 stakeholder pressures, firm strategies in relation to climate change issues (Lee 2012,
20 Sprengel and Busch 2011), differ dependent on drivers and barriers (Chkanikova and
21 Mont 2012). This may include extending the level of responsibility for sustainable
22 performance beyond the reach of firm ownership and direct control, to upstream
23 supply chain and network partners (Gimenez and Tachizawa 2012, Walker and
24 Jones 2012). Market structure is a key determinant, and in the concentrated UK food
25 retail industry, ‘own brands’ are an important component of business strategy. As
26 production is outsourced to key suppliers, management of the supply chain is critical.
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51 For our purposes, we adopt the definition of sustainable consumption as “the use of
52 goods and services that respond to basic needs and bring a better quality of life,
53 while minimising the use of natural resources, toxic materials and emissions of waste
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3 and pollutants over the life cycle, so as not to jeopardise the needs of future
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5 generations” agreed at the Oslo Symposium of 1994 (IISD, n/d).
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10 There is a wealth of studies based on sustainable purchase intention rather than
11
12 actual purchasing behaviour (for example Shrum et al. 1995; Robinson and Smith
13
14 2002; Selfa et al. 2008; Vermeir and Verbeke 2008). In addition, papers come from
15
16 geographically diverse regions, are based on varying consumer groups, and focus
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18 on behaviour intentions or self-reported behaviour (for example USA: Bissonnette
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20 and Contento 2001; Ellen et al. 1991; Roberts 1996; Robinson and Smith 2002;
21
22 Shrum et al. 1995 and Selfa et al. 2008. China: Chan 2001. Belgium: Vermeir and
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24 Verbeke 2008 and 2006. Canada: Berger and Corbin 1992; Hirsh and Dolderman
25
26 2007. UK: Bhate and Lawler 1997 and Diamantopoulos et al. 2003). The literature
27
28 shows that environmental concern is fairly widespread but often also finds there to
29
30 be an attitude/intention – behaviour gap, and several authors have highlighted that
31
32 situational factors can play an important role in purchase behaviour (for example
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34 Vermeir and Verbeke 2006, Carrington et al. 2010; Bezencon and Blili 2010; Bray et
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36 al. 2011; Belk 1975; Barker and Wicker 1975; Bhate and Lawler 1997;
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38 Diamantopoulos et al. 2003; Hobson 2003).
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46 Previous studies have attempted to classify situational factors (Kaiser and Keller
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48 2001; Tanner et al. 2004; Diamantopoulos et al. 2003; Barr 2003, Belk 1975). The
49
50 assumption is that there is some situational factor or intervention between motivation
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52 and actual behaviour that either inhibits or encourages sustainable purchasing. One
53
54 situational factor that may impede or facilitate sustainable purchasing behaviour is
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56 information. The social and environmental impact of a product are credence
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3 attributes which cannot be identified by consumers either before or after purchase
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5 (Beltz and Schmidt-Riediger 2010), and so information related to such attributes may
6
7 impact on awareness and understanding. Bray et al. (2011) notes that information
8
9 may be an intervening factor between sustainable intentions and consumption. A
10
11 number of authors note that consumers are constrained in their ethical purchasing
12
13 decisions not just due to a lack of product information, but also a lack of choice and
14
15 availability of sustainable products within mainstream retail outlets (Beltz and
16
17 Schmidt-Ridiger 2010; Sebastiana et al. 2012; Nicholls and Lee 2006; Vermeir and
18
19 Verbeke 2008). The assumption is that the availability of appropriate information
20
21 regarding sustainable consumption is crucially important in empowering consumers
22
23 to take appropriate action and change their behaviour (Markkula and Moisander,
24
25 2012). However, too much information is counterproductive and may inhibit purchase
26
27 behaviour, whereas consumers' perceptions of the quality of information would
28
29 appear to be far more important in actual ethical purchasing behaviour (de
30
31 Pelsmacker et al. 2007). It therefore remains a challenge for individuals to negotiate
32
33 a path through the abundance of sometimes contradictory sustainability related
34
35 information, and translate knowledge into practice (Markkula and Moisander, 2012).
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43 As a result, measuring what individuals actually do and exploring the reasons behind
44
45 such behaviour are important factors in understanding how consumers respond to
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47 information. However, little is known about the impact of information on actual
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49 sustainable purchasing behaviour, as relatively few studies are conducted in the real
50
51 world of consumers (Bray et al. 2011; Carrington et al. 2010).
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55 ***Eco labelling***

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3 Labelling is one strategy to increase information at the point of purchase. Eco
4
5 labelling attempts to communicate information to consumers regarding the
6
7 environmental externalities of global production, with the assumption that concerned
8
9 consumers can make comparisons, and give preference to products or services that
10
11 have less environmental impact (Craig Smith et al. 2010; Gertz 2004). The
12
13 employment of eco-labels as a means to promote sustainable purchasing is debated
14
15 within the literature. There are several examples of studies whereby eco-labelling
16
17 has had an effect on consumption behaviour eg Henion 1972, Teisl et al 2002;
18
19 Srinivasan and Blomquist 2009, Bjørner et al 2004, Tang et al 2004, Grankvist et al
20
21 2004) , although often they come with a caveat. In summary, Tang and Fryxell
22
23 (2004) concluded that any influence from an eco-label will diminish if other product
24
25 attributes are weak. This is also supported by research that finds that consumers are
26
27 more likely to purchase such products when they are not required to pay more,
28
29 sacrifice quality or make a special effort (Carrigan and Attalla 2001; Vanclay et al.
30
31 2011).

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37 Criticisms of eco-labelling are also prevalent. van Amstel et al. (2008) assessed five
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39 eco-labels in the Netherlands and found that their communication was not reliable.
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41 They suggest failures in terms of insufficient information and recommendations,
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43 ambiguity and lack of assurance to buyers about the ecological impact of the
44
45 purchase. Hoogland et al. (2007) note that information will not automatically cause
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47 changes in beliefs and purchase intentions across consumers with different values
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49 and they suggest that a product label can only help a consumer make sustainable
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51 choices if they are able to gain understanding at the very moment of deciding on a
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53 purchase. Owen et al. (2007) found UK focus group participants unsure as to
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55 whether detailed on-pack labelling would help them, due to the amount of
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3 information they already think about during shopping. Eden et al. (2008) found that
4
5 UK focus group participants were generally confused and lacked confidence in eco
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7 labels.
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10 *Carbon Labels*

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13 Carbon labels, as an example of eco-labels, are the end result of an attempt to
14
15 estimate the total amount of carbon dioxide and other greenhouse gases emitted
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17 during the manufacture, distribution, use and disposal of a service or product.
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19 Carbon labelling attempts to communicate the 'carbon footprint' of a product to those
20
21 making sourcing decisions within organisations, but also to consumers, thus
22
23 enabling them to actively participate in sustainable development (Brenton et al.
24
25 2009). The aim of the carbon label is to facilitate sustainable purchasing behavior for
26
27 main stream consumers, by delivering information on the environmental footprint of a
28
29 labeled product, and offering choices within a category (Gadema and Oglethorpe
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31 2011).
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37 Carbon labelling initiatives began to develop in 2007, often driven by business and/or
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39 government support but confined to trials and pilot projects involving the auditing and
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41 labelling of limited ranges of consumer products (Hartlieb et al. 2009; Brenton et al.
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43 2009). France, US, Switzerland, Germany, Japan and Korea are examples of
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45 countries who became engaged in trial schemes on limited product ranges (Brenton
46
47 et al. 2009). In 2001, the UK government set up The Carbon Trust, a private
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49 company originally set up as a response to the threat of climate change, with the
50
51 remit to assist both the public and private sector to move to a low carbon economy.
52
53 The Carbon Trust has developed a number of different types of carbon foot printing
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55 initiatives, which aim to measure and certify the environmental footprint of an
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3 organisation, a product or service, or a value chain, and includes a carbon label. The
4
5 label shows the amount of carbon dioxide (and other greenhouse gases) emitted
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7 during the manufacture, distribution, use and disposal of a product - the carbon
8
9 footprint over its lifecycle (The Carbon Trust 2009a). Launched in 2007, the Carbon
10
11 Trust note that the role of their label is to allow consumers to "...choose those
12
13 products that have smaller footprints and therefore contribute less to climate change"
14
15 (The Carbon Trust 2009b). In 2010, The Carbon Trust claimed that the Carbon
16
17 Reduction Label has been used on 90 brands, 5,000 products across 19 countries
18
19 with sales worth £2bn (The Carbon Trust Certification, 2013).
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24 Early research exploring consumers' understanding, attitudes and intentions towards
25
26 the concept of carbon labelling has been mixed (The Carbon Trust 2010b;
27
28 Wheatland 2007; Gadema and Oglethorpe 2011). Since the introduction of carbon
29
30 labelling, there have been a few attempts to examine consumers responses to
31
32 carbon labels, but these are in terms of attitudes or self-reported behaviour (Gadema
33
34 and Oglethorpe 2011; Upham and Bleda 2009; Berry et al. 2008). There are no
35
36 known publically available findings on the impact of carbons labels on actual
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38 purchasing behaviour.
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43 In April 2008, Tesco, the largest grocery retailer in the UK, and the third largest in the
44
45 world, became the only retailer in the UK to introduce the Carbon Trust's Carbon
46
47 Reduction Label on twenty own label products from four categories (washing
48
49 detergent, orange juice, light bulbs and potatoes). Later, more products and other
50
51 product categories (milk, kitchen towel and toilet tissue) were added. This is part of
52
53 an overall strategic objective to reduce emissions of greenhouse gases throughout
54
55 the supply chain, including working with own brand suppliers and consumers to help
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57 them reduce their environmental impact (Tesco 2012; McKinnon 2010; Brenton et al.
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3 2009). Availability and price directly determine the opportunity structure for
4 consumers to purchase environmentally labelled products (Koos 2011; Grankvist
5 and Biel 2007). It can therefore be assumed that increased availability of carbon
6 labelled products within main stream non-niche categories - by the largest player in
7 the UK food industry - would increase the likelihood of sustainable purchasing
8 behaviour.
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18 Tesco collects information on purchasing behavior via their customer loyalty card
19 scheme, offering an opportunity to measure actual changes in purchasing behaviour.
20 The data consists of continuous rolling weekly point-of-purchase sales data on all
21 products, amounting to over 265,000 product items. The sample size used in the
22 database is ten per cent of the total population of loyalty card holders, which is equal
23 to approximately 1.4 million shoppers. Weekly data on key sales measures for all
24 products sold in Tesco for a period of up to two years can be extracted. Loyalty card
25 data combine the advantages of using scanner and panel data, as data on sales are
26 collected on a large scale, but can also be disaggregated by customer segments.
27 Felgate *et al* (2012) note that loyalty card schemes are a valuable tool in providing
28 data to significantly contribute to the understanding of marketing issues. The
29 advantage of using loyalty card data is that it offers an opportunity to explore how
30 different customer segments have responded to the carbon label trial.
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49 Some preliminary data analysis on the initial trial products using the loyalty card
50 database was undertaken to establish the impact of the carbon label and other
51 limited additional point of purchase information on purchase behaviour. Key measure
52 reports were used to investigate how the sales of carbon labelled products on three
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3 product categories had performed since their introduction – orange juice, potatoes
4 and washing detergent. Reports were run for the carbon labelled products and
5 comparison groups, in order to attribute any changes to the label rather than general
6 trends taking place across a product category. Reports were run for two time
7 periods, both before (June – October 2007) and after the introduction of the label
8 (June – October 2008). The performance measures demonstrated that sales of the
9 carbon labelled products remained in the minority within each of the four product
10 categories, and there was a lack of consistent evidence that overall sales of carbon
11 labelled products had increased, although there were small differences at the
12 individual product level. Shopper profile reports were also generated in order to
13 identify the characteristics of shoppers who had actually purchased carbon labelled
14 products and more importantly, those shoppers who had not. Using the Lifestage
15 segmenting approach (Older Adults, Older Families, Young Adults, Young Families,
16 Pensioners, Multigenerational households) the purchasing data identified an overall
17 lack of significant inclination to purchase carbon labelled products by all groups, with
18 pensioners to be significantly less inclined to purchase carbon labelled products.
19 The main finding is that carbon labels had little effect on purchasing behaviour, but
20 little is known regarding why this should be the case. Further exploratory research is
21 therefore required in order to understand the reasons behind such a result.
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48 In summary, we can conclude that the aim of carbon labelling is to enable
49 consumers to participate in sustainable purchasing behaviour at the point of
50 purchase. Research examining attitudes or self-reported behaviour with regard to
51 carbon labelling has shown mixed results, and the consumer behaviour literature
52 identifies the gap between attitudes and actual behaviour. The aim of this study is to
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3 further explore the role of carbon labelling in sustainable purchasing behaviour within
4 a real world context. In pursuit of this, preliminary exploration of Tesco loyalty card
5 data notes that carbon labels have had little effect on actual purchasing behaviour.
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7 However, the reasons behind such findings need to be explored, particularly any
8 differences in perspectives between consumer segments.
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16 **Methodology**

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18 In order to explore the role of carbon labelling on sustainable purchasing behaviour
19 within the context of the Tesco trial, a series of focus groups were held to gain an
20 appreciation of current levels of awareness, understanding and use of carbon
21 labelling. Focus groups are an appropriate methodology in order to understand
22 differences in the perspectives of different segments, to allow ideas to emerge and
23 when the goal is to appreciate drivers of opinions, motivations or behaviours
24 (Krueger and Casey 2000). A series of focus groups with Tesco shoppers were
25 conducted during September and October 2009. Female participants were recruited
26 given that they are assumed to be responsible for the majority of grocery shopping.
27 To allow for comparisons between different consumer segments, a purposive sample
28 of consumers was required (Morgan 1998), and so participants were recruited
29 according to their level of environmental concern (strong, moderate and none at all)
30 in order to establish differences between segments. Participants were also recruited
31 according to three defined Tesco customer loyalty card database segments, namely
32 Young Adults aged 20-39 with no children; Older adults aged 40-59 with no children,
33 and Young Families with children under ten. Each group consisted of between six to
34 eight female participants (Krueger and Casey 2000), and a total of nine focus groups
35 was conducted. Moderation was non-interventionist, and participants were
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3 encouraged to speak freely and openly. Full transcripts of the audio and video
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5 recordings were made. One criticism of focus groups is the reliance on reported
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7 behaviour (Gordon 1999) but the focus groups were intended to be an exploration of
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9 *why* shoppers behave in a certain way. In particular, the aim of the focus groups was
10
11 two-fold, namely to gain insight into the role of environmental concern on the actual
12
13 shopping process, and to explore levels of awareness, understanding and use of
14
15 carbon labels.
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20 21 Findings

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23 The overall consensus of the focus groups was that the environment was not a
24
25 primary consideration for participants when actually in the store, although many
26
27 reported that it was something they thought about at home, particularly in relation to
28
29 recycling. Where participants said that they were thinking of the environment in the
30
31 store, this was often in terms of a dislike of excess packaging, rather than relating to
32
33 specific types of products they would purchase.
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36
37 *"I do when I think of turning the TV off or something but when I go shopping, I tend to*
38
39 *just kind of be thinking about food"* (Young Adults, Moderately Influenced)

40
41 *"I tend to think of that sort of thing that way (recycling), rather than in food shopping"*
42
43 (Older Adults, Moderately Influenced).

44
45 *"I think you think about it once you're outside the supermarket, but when you're in*
46
47 *there, you're so overwhelmed with other things that perhaps it fall slightly lower down*
48
49 *the agenda"* (Young families, Moderately Influenced).

50
51 *"Not as far as that, not as far as greenhouse gases and that....I'm there to shop and*
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53 *get food and put it in my belly, the last thing I'm thinking of is greenhouse gases! I'm*
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3 *being honest! I don't want to worry about looking at greenhouse gases on a label,*
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5 *I'm being perfectly honest."* (Older Adults, Strongly Influenced)
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8 In comparison to other groups, Young Families spoke the most about the influence
9
10 of others on the shopping process, namely children.

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12 *"My whole shopping list orientates around my daughter and what she can or can't*
13
14 *have"* (Young Families, Not at all influenced).
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16
17 *"In terms of like what I'm choosing I go through the kids stuff first..."* (Young
18
19 Families, Strongly influenced).
20

21
22 *"If I don't write a list I cannot remember what I need, I literally get in there and my*
23
24 *whole mind goes blank. It's a nightmare and the kids are throwing things..."* (Young
25
26 Families, Strongly influenced).
27

28
29 *"I hate going with the children because you come away from the list that's in your*
30
31 *mind"* (Young Families, Not at all Influenced).
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35 The second objective was to explore the awareness, understanding and use of
36
37 carbon labels. The focus groups revealed that the vast majority of participants
38
39 reported no recognition of seeing the carbon label on products in Tesco, and not one
40
41 participant reported the carbon label having any influence on their purchasing
42
43 behaviour. When shown a large version of the carbon label, some participants
44
45 thought the label was about recycling, and all expressed confusion regarding the
46
47 meaning, the purpose of the label and how they were expected to respond to it:
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49

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51 *"Those figures don't really, if I'm honest, mean anything to me"* (Young adults,
52
53 Moderately Influenced)

54
55 *"the scale, 700g, whether was good or bad, what message they were trying to tell*
56
57 *me! I'm assuming it's bad!"* (Young adults, Strongly Influenced)
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3 *“don’t know what it means”* (Young families, Strongly Influenced)

4
5 *“I have to say that label means something to do with your carbon footprint but 700g*
6 *per pint (milk) ‘shwoosh’ gone straight (over my head)... I have no knowledge of what*
7 *that means”* (Older adults, Moderately Influenced).

8
9
10
11 *“I think you need to have a university degree in that to be able to read it”* (Young
12 families, Moderately Influenced)

13
14
15
16 *“Is it telling you not to buy that, and buy the non-bio one... ?”* (Young families,
17 Strongly Influenced)

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19
20
21 *“...the word consumption means us eating the loaf doesn’t it? So what are they*
22 *saying that we need to eat it in a certain way to reduce...?”* (Young adults, Not at all
23 Influenced).

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26
27 Although there was some understanding of the carbon label’s connection with
28 carbon footprints and the environment generally, participants lacked understanding
29 of what the carbon label meant. The concept of grams of carbon was particularly
30 problematic for the participants, especially when trying to relate this to something
31 quantifiable that they could understand.

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38 *“I don’t think people know about CO2 and the impact it has on the environment, I*
39 *think there’s a bigger issue where people need to be educated”* (Young families,
40 Strongly Influenced).

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46
47 *“I think they need to define what they mean by, somebody needs to define carbon*
48 *footprint. Does it mean eco-friendly? Or is that something completely different? As a*
49 *term I kind of get it but I don’t get it enough to make me buy those products”* (Young
50 families, Not at all Influenced).

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52
53
54 *“The problem I have with this I can’t really put it into context, I don’t know how it*
55 *relates to other things. OK its 700g reduce it by 60 so it’s then going to be 640 well,*
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3 *what does that mean in the big scheme of things?"* (Older Adults, Strongly
4
5 influenced).

6
7
8 *"Don't know what it means"* (Young Families, strongly influenced).

9
10 Overall, participants lacked awareness, understanding and use of the carbon label
11
12 across all focus groups. An overwhelming response from participants was the need
13
14 for education as current understanding was poor, and participants commented on the
15
16 lack of education, government effort or media focus on carbon labels:
17

18
19 *"You see the salt sign, because it's that's drilled into us, not drilled into us but it's*
20
21 *been such a big thing through the government and everything..."* (Young Adults,
22
23 moderately influenced)

24
25
26 *"It feels like a token gesture rather than a big commitment"* (Young Families, not at
27
28 all influenced).

29
30 *"I don't think people know about CO₂ and the impact it has on the environment, I*
31
32 *think there's a bigger issue where people need to be educated"* (Young Families,
33
34 strongly influenced).

35
36
37 *"I think the point is no ones explained it...so that's why it doesn't mean anything to*
38
39 *any of us....because no one's said..... We don't know so why should we do*
40
41 *anything about it?"* (Young Families, moderately influenced).
42
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45
46 The focus group participants also debated the whole concept of where responsibility
47
48 should lie for sustainable purchasing behaviour. Some participants felt strongly that
49
50 environmental protection, in particular the negative impacts of excess food
51
52 packaging, is the responsibility of the manufacturer and supermarket, and appeared
53
54 to resent the onus on consumers. Young Families in particular were in favour of
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3 'choice editing' whereby retailers take responsibility to edit out less sustainable
4 products on behalf of consumers (Sustainable Development Commission, 2006).

5
6
7 *"...only stocked products where they'd taken into account the carbon footprint...
8 would take the responsibility off of us and we wouldn't have to worry about that,
9 because we've got enough to worry and think about". (Young Families, Not at all
10 Influenced).*

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16 *"Why don't the supermarkets if one is less carbon footprint, why don't they just go for
17 the option that is better and reduce money that way, rather than giving us 20,000
18 options and making us choose". (Young Families, Moderately influenced).*

22 23 24 25 **Discussion and Conclusion**

26
27 The aim of this study is to examine the role of carbon labelling in retail supply chains
28 in response to calls to examine sustainable purchasing behaviour within a real world
29 context (Bray et al. 2011; Carrington et al, 2010; Andorfer and Liebe 2012). The
30 extensive own brand trial by Tesco overcomes some of the lack of availability, price
31 and within-category choice constraints that have been identified as possible
32 constraints on sustainable purchasing decisions within mainstream retail outlets
33 (Beltz and Schmidt-Ridiger 2010; Gadema and Oglethorpe 2011; Sebastiana et al.
34 2012; Nicholls and Lee 2006; Vermeir and Verbeke 2008). Examining the Tesco
35 supermarket purchasing data of carbon labelled products over time has
36 demonstrated that there has been little impact in terms of encouraging sustainable
37 purchasing behaviour within main stream product categories and across various
38 consumer segments. Given this evidence, the findings from the focus groups
39 identified possible reasons behind this lack of impact: lack of awareness and
40 understanding of carbon labelling; constraining or facilitating social and cultural

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3 influences, and the heterogeneous nature of consumers. The findings have
4 important implications for a number of stakeholders.
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10 Given the scale of the environmental challenges associated with the sustainable
11 development of our global food system, collaboration between industry, government
12 and society are necessary in order to share information and develop quicker, easier
13 and more cost effective methods of measuring, reducing and communicating the
14 carbon footprint of a product along the supply chain. Food retailers' who adopt an
15 own brand strategy can utilise their relationships with suppliers further by working
16 collaboratively with suppliers, and sharing consumer insight, to develop targeted
17 information strategies to raise awareness, improve understanding and ultimately
18 change behaviour. An alternative strategy for retailers is to respond to those
19 consumers who feel they should not be held responsible for sustainable
20 consumption. A strategy of 'choice editing' and mainstreaming of a carbon labelling
21 approach that is designed as a 'stamp of approval' rather than for comparison
22 purposes may be more effective.
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40 Given the significant need for increasing understanding about environmental issues
41 in general, and carbon emissions in particular, policy makers may develop social
42 marketing campaigns taking into account the heterogeneous nature of the
43 population. As an example, this research noted that families with young children
44 identified the important influence of their children on the shopping process; therefore
45 introducing the topic of carbon measurement and foot printing into the educational
46 curriculum may lead to a positive change in sustainable purchasing behaviour for
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this segment over time. Further research could explore how to effectively engage other consumer segments.

We acknowledge the limitations of a research approach that relies on a small sample of consumers, in terms of generalisability of findings. However, the aim was to explore the role of carbon labelling within a real world setting, and to open up further avenues of debate and research. Given the challenges associated with the environmental consequences of global production and consumption, exploration of strategies to reduce carbon emissions continues to be of importance.

For Peer Review

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25 http://www.lek.com/UserFiles/File/Carbon_Footprint.pdf.