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Sustainability in the Food Sector: A Consumer Behaviour Perspective

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ABSTRACT

Consumers have, through their food choices, a major role in bringing about more sustainable food production. However, this presupposes that differences in sustainability are communicated to consumers. Even if food products are eco-labelled and consumers are motivated to support sustainability, a number of potential barriers may prevent consumers from using the information to make sustainable choices. Six such barriers are discussed in this paper.

Keywords: Sustainability, consumer behaviour, hierarchy of effects, eco-labels

1 The role of consumers in attaining sustainability

Consumers have a major role in making food chains more sustainable. Consumers, by the choices they make when buying food, have a major impact on which foods are being produced, and how they are produced. While the way food is being produced can be changed by regulation, market forces are a major driver in the way food chains are developing. And here consumers have a crucial role.

All actors in the food chain affect the overall sustainability of the chain. Animal and plant production, fisheries, all stages of food processing have an impact on sustainability, as well as the way food and other inputs are being transported between the various actors in the food chain. And when consumers buy food, the chain of impacts on sustainability has not finished – the way consumers buy, transport, store, prepare and dispose of foods affects sustainability as well.

However, *consumer food choice* is a break point in the chain. Consumers can reward more sustainable food production by their choices, and similarly punish less sustainable alternatives. More sustainable alternatives, if not enforced by regulation, need to stand the market test: whether consumers prefer them over less sustainable alternatives. Retailers play a major role as well, since they decide, at the least for the bulk of food purchases, which products consumers can choose from. Retailers may choose to place products produced in a more sustainable way on their shelves because they think consumers will like them, and/or because they have a policy of corporate social responsibility that includes sustainability. But retailers will always want to give consumers a choice, implying that the more sustainable alternative has to win over consumer choices from the conventional products that consumers are used to.

Even though sustainability is an abstract concept with various definitions, many consumers think sustainability is a good thing. And even when they may be wary about the concept of sustainability, they may have a positive attitude to central components of sustainability, like environmental protection. So there should be a good basis for developing and marketing products that are positioned as the more sustainable alternative.

However, there are complications. We know from the history of organic products that positive attitudes do not always translate into purchases (Thøgersen, 2010). Being positive towards sustainability at the abstract level and buying a less sustainable food product are not necessarily contradictions. First of all, and most fundamentally, sustainability has to be communicated. Sustainability is a credence characteristic of food products, it cannot be seen or tasted. If a food product has been produced in a more sustainable way, this has to be communicated on the food label. Communicating sustainability on the food label is also known as eco-labelling (Erskine & Collins, 1997).

There are lots of eco-labels on food products. Most cover only certain aspects of the broader sustainability concept. In addition to organic labels there is a range of labels signalling environmental protection, and others signalling fair trade, animal welfare, carbon footprint, local production and other aspects.

In the following, I will discuss a number of barriers that may prevent such labels from affecting consumer choice, and thus prevent that the more sustainable alternatives will in fact be rewarded in the market place. I will not address the basic question whether people are in fact interested in sustainability, because I assume that most people are, just as most people are interested in health, even though they may not always act in a healthy manner. Likewise, I will not distinguish between different facets of sustainability. A label covering a narrow aspect of sustainability, like the 'mountain region' labels promoted in Switzerland and other regions where preserving agricultural production in mountainous regions is an issue, may appeal to fewer people than a label signalling environmentally friendly production in the broad sense. But the barriers I will discuss in the following apply to all these labels. This has the advantage that we can draw on experiences, and extant literature, with regard to a range of different labels.

2 Six barriers to sustainable consumer food choice

If we imagine a set of food products carrying eco-labels, and a population of consumers with a positive attitude towards sustainability, what could be reasons for that these consumers do not choose these products after all, or may be buy them a few times and then go back to their usual purchases? In discussing possible barriers, I will draw on a classical hierarchy of effects model (figure 1; for similar approaches see Leire & Thidell, 2004; Rex & Baumann, 2007; Thøgersen, 2000, 2002). In order for an eco-label to lead to more sustainable behaviour, it is not enough that consumers are exposed to it in the shop. Consumers need to perceive them, need to attach some form of understanding to them, and make inferences on what they mean for themselves. They need to enter their decision-making, where the label information may be traded off against other criteria. Even when this ends with the more sustainable alternative being chosen, the positive effect of this one choice may be counteracted by other, less sustainable choices made in other areas. The whole process will be affected by whether consumers are aware of the label and its meaning and find it credible, and whether their basically positive attitude to sustainability translates into motivation to choose sustainably at the time of purchase.

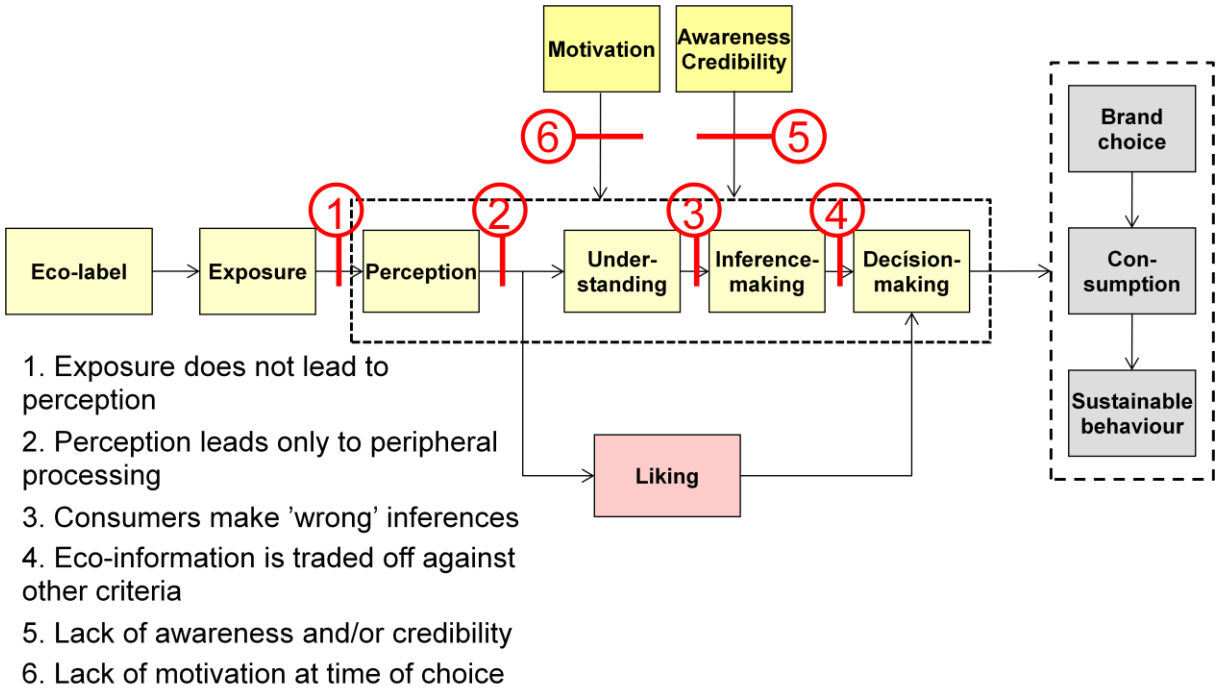


Figure 1. Hierarchy of effects of eco-labels and potential barriers

Based on this framework I will discuss the following six possible barriers:

- *Exposure does not lead to perception.* Consumers simply do not notice the label, because they are time-pressured when shopping and most purchases are made habitually.
- *Perception leads only to peripheral processing.* Consumers see the label, but do not care to make an effort to understand what it means. It may still affect their choices, though.
- *Consumers make 'wrong' inferences.* Consumers do see the label, make an effort to understand what it means, but draw the wrong inferences. They may end up buying the product, but for the 'wrong' reasons.
- *Eco-information is traded off against other criteria.* The price may be higher, the taste is not good, the family prefers something else.
- *Lack of awareness and/or credibility.* Consumers who want to make sustainable choices may find it hard to carry them out in practice.
- *Lack of motivation at time of choice.* While consumes have a positive attitude towards sustainability, this attitude is not so strong that it affects behaviour in all situations where sustainability may be a criterion. We can say that consumers 'forget' about their positive attitude to sustainability when making food choices. Such 'dormant' attitudes are a major factor in explaining discrepancies between attitude and behaviour.

I only discuss barriers to sustainable choice within a given set of alternatives, i.e., for a given product category. The sustainable choice in a given category may be offset by other behaviours – people may buy all the sustainable alternatives in the shop, but the shop they choose to do their shopping in may require a long ride in their own car. The net effect on sustainability may not be clear then. These kinds of trade-offs will not be discussed in this paper.

In discussing these barriers, I will draw on examples from extant research, including some of my own. The present paper does not attempt to give an exhaustive review of research that has been done on eco-labelling.

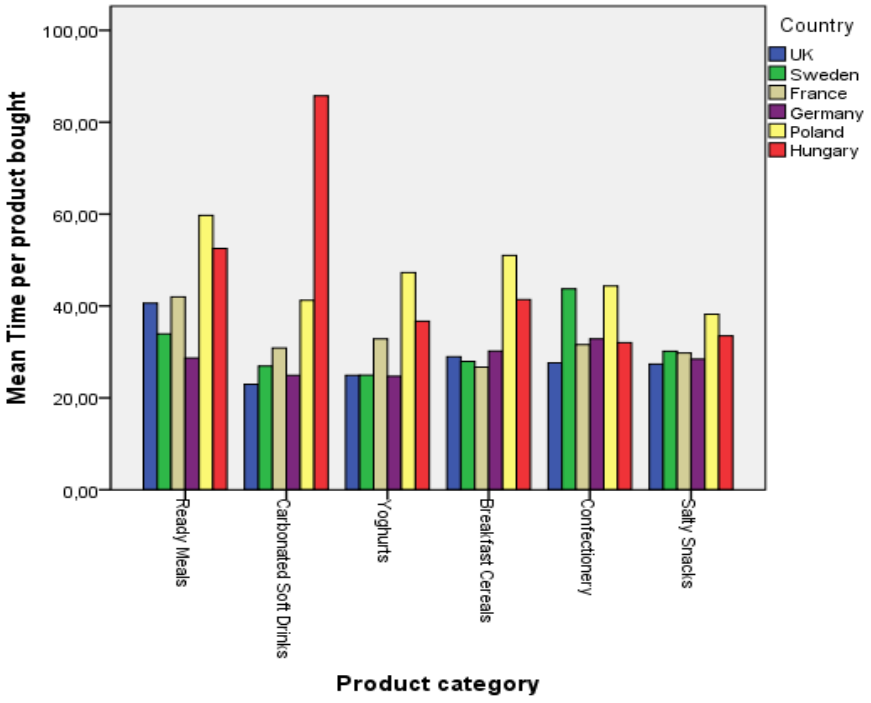
3 Exposure need not lead to perception: Do you consumers perceive eco-labels?

Retail shopping occurs in an information-overloaded environment, where consumers make a large number of choices within a relatively short time span. Consumers handle this by simplifying decisions, using heuristics, and buying many products on a habitual basis. Research on selective attention would suggest that much information on and around products is ignored, or at least not consciously perceived.

We do not know much about which pieces of information on food packages consumers actually do perceive during a typical shopping trip. The question is not easily researched, and the majority of studies on the use of different types of labelling information rests on self-reported retrospective behaviour ("How often do you use…") which, in all likelihood, results in considerable overreporting (Podsakoff et al., 2003). Eye-tracking studies (Duchowski, 2002) provide good insight into which aspects of a food package are best in attracting attention, but as they usually take place in a laboratory, their external validity is also questionable (mobile eye-trackers exist, but are of limited use for a number of reasons). Observational studies and accompanied shopping trips would be best in finding out to which extent eco-labels are actually perceived in the retail setting.

A prerequisite for consumers actually perceiving an eco-label is that they spend a minimum of time making their choices, and that they at least look at the product chosen before putting it into the shopping cart. Figure 2 provides some evidence on this. In a study on use of nutrition information on food products (Grunert et al., 2010), shoppers in six European countries (UK, Sweden, France, Germany, Poland, Hungary) were observed at the aisles of six different product categories (salty snacks, confectionary, breakfast cereals, yoghurts, carbonated soft drinks, ready meals). Time from arrival at the aisle until leaving with at least one product bought was recorded, and average time per product bought was computed. It was also recorded whether shoppers looked at the front of the product before putting it into the shopping cart, whether they looked elsewhere, or whether they did not look at the product in any detail. Shoppers spent, on average, 35 seconds per product bought (28 in the UK and Germany, 30 in France, 31 in Sweden, 47 in Poland and Hungary). The average time was highest when buying ready meals (43 seconds) and lowest for salty snacks (31 seconds), which may indicate that some product groups like ready meals are more characterized by variety seeking and hence 'real' decisions than others. Closer inspection also showed that the time distribution was skewed, with a few shoppers spending several minutes in making decisions, and 40% of the respondents using less than 15 seconds. Thus, choices are very rapid, but the findings also showed that 62.6% of respondents were observed to have looked at the front of the package and 7.7% were observed to have looked at it elsewhere (these figures refer to the first product bought).

(a) Time used per product bought for six product categories in six countries



share of shoppers looking at front of label, looking elsewhere at label, not looking at product in detail

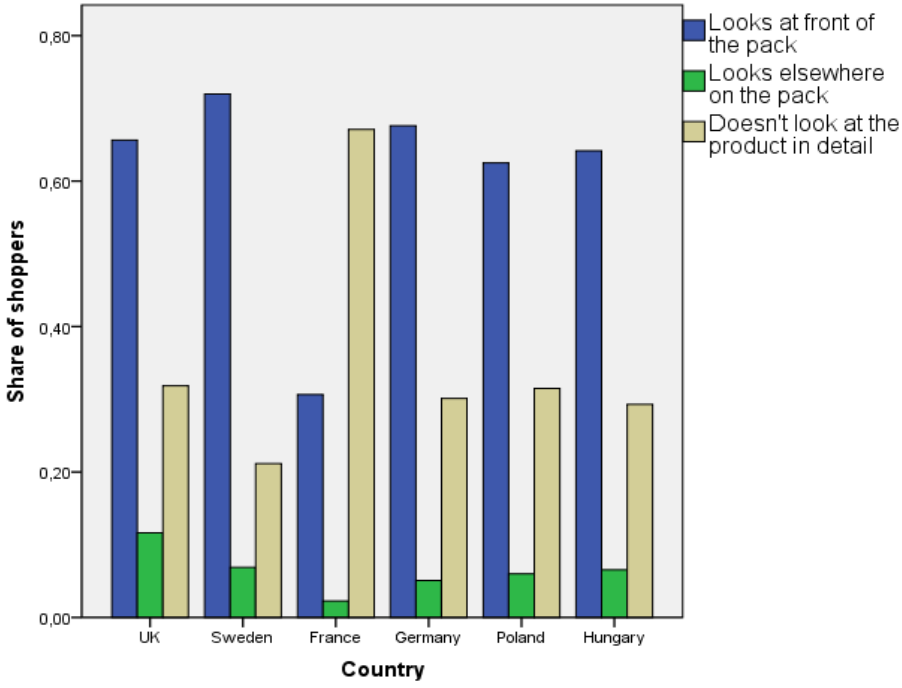


Figure 2. Decision time and label exposure during shopping
(adapted from Grunert et al., 2010, based on store observations, UK n=2019, Sweden n=1858, France n=2337, Germany n=1963, Poland n=1800, Hungary n=1804)

These figures show nothing about the percentage of consumers who do perceive eco-labels. But they show that the potential is there – most consumers look at least at the front of the product before choosing it, meaning that consumers would have the opportunity to perceive and process the eco-label information if sustainability is a major motive for them.

4 Perception may lead only to peripheral processing: What does that imply for sustainability?

Dual processing theories (Evans, 2008), and especially the Elaboration Likelihood Model (Petty & Cacioppo, 1986), have been applied widely in the analysis of the effects of market communication and especially advertising (Petty, Cacioppo & Schuman, 1983). The basic premise is that there are two ways of processing a message, central and peripheral. Central processing requires that the receiver is motivated and able to process the message, and will lead to in-depth processing of the substantive content of the message. However, when the receiver is not motivated to process the message, or when s/he is not able to process it, for example because of a lack of knowledge that allows attaching meaning to the message, peripheral processing may occur. Peripheral processing is a more shallow form of processing, typically dealing more with aspects of the form rather than the content of the message. Peripheral processing can still result in the formation of attitudes to the message object, even though these attitudes may be less stable and less strongly linked to behaviour.

In the context of eco-labelling, peripheral processing means that consumers may form a positive attitude towards the label, even use it in their decision-making, without making an effort to understand what the label is all about. It is conceivable, for example, that some consumers like the EU 'flower' eco-label, because they like the typography and the smart way in which the stylized flower is combined with the EU logo. They may also like it because they are Europhiles and react with positive affect to European symbols. The liking may, in turn, affect the probability of buying the product carrying the logo. In either case the liking, and the possible consequence for purchase probability, are not based on an understanding of what the label stands for.

Juhl and Poulsen (2001) have tried to investigate the role of peripheral processing with regard to various types of labels, including a range of eco-labels like the EU flower, the UN-sponsored blue angel, the Nordic swan label, as well as labels for organic and fair trade production. They measured, for a sample of Danish consumers, awareness of these labels, whether respondents thought that they knew what these labels stand for, and whether they make use of them in their decision-making when shopping. The underlying rationale of the study design was that when respondents are aware of the label, don't understand what it stands for, but still use it in their decision-making, then these must be cases of peripheral processing. Figure 3 shows, for two of the labels, the distribution of responses to these three variables. Out of the total sample, 29% claim to be aware of the Swan, understand what it means, and use it in their decision-making, which we can interpret as cases of central processing. But an additional 9% claim to use it in their decision-making, even though they do not think they understand what it means, which Juhl and Poulsen view as cases of peripheral processing. The corresponding figures for the EU flower were 12% and 8%. Across all 11 labels in the study, percentages of respondents in the peripheral processing category varied between 1 and 9%.

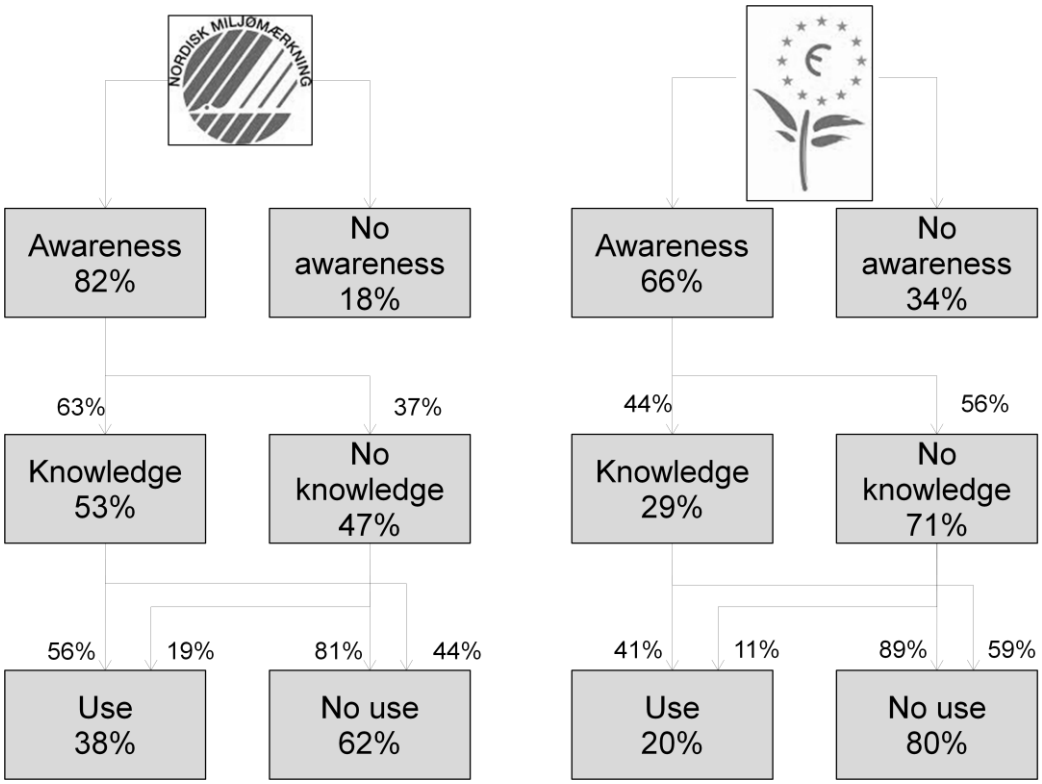


Figure 3. Awareness, knowledge and use of two eco-labels and incidence of peripheral processing (adapted from Juhl & Poulsen, 2001, Danish sample, n=638)

The study is based on self-reported use, and usage frequencies, no matter whether based on central or peripheral processing, may therefore be inflated. Still, it is interesting that understanding, in the minds of shoppers, does not seem be a prerequisite for use of labels. And it raises the question whether peripheral processing of eco-labelling information is, from a sustainability perspective, desirable or problematic (for a similar issue in nutrition labelling, see Grunert, Bolton & Raats, in press).

When eco-labels serve the function of singling out more sustainable alternatives, and when the peripheral processing results in a positive affective reaction to the label that may support choice of the product bearing the label, then peripheral processing will support the aim of encouraging more sustainable choices. But of course, there are caveats. First, by definition the affect resulting from peripheral processing will be based on the looks and the symbolism of the label, not on what the label stands for. Labels only weakly related to sustainability may lead to more positive affect than labels having a stronger sustainability background, in substantial terms. In the extreme, manufacturers could invent pseudo-eco labels only with the aim of encouraging peripheral processing. Another issue is that the affect does not need to be positive. An EU-sceptical shopper may react with negative affect to the EU flower, lowering the likelihood of buying the product, even though the same shopper may be positive with regard to the issue of sustainability.

There is very little research on peripheral processing of labelling information. However, in the real world of time-pressured supermarket shopping, it may be a phenomenon one should look more at.

5 Consumers make 'wrong' inferences: Are labels creating the wrong expectations?

Even when consumers engage in central processing, i.e. try to make sense of the eco-label, this does not necessarily imply that the meaning they attach to it is 'correct' in any objective sense. Attaching meaning is a constructive process, where externally acquired information – here, the eco-label – is interpreted in the light of existing knowledge, leading to inferences on what this means for the goals that the consumer is pursuing. Inference formation is a major mechanism in understanding how consumers form impressions about the quality of a product, and examples of more or less queer inferences abound (Grunert, 2005).

Inferences have been widely studied in the context of organic food and related production methods (e.g., Aertsens et al., 2009; Harper & Makatouni, 2002; Magnusson et al., 2003), like free-range pig farming. A stable result across a range of studies is that many consumers believe that organic food products are healthier. That is, from an objective perspective, at least not unequivocally true, and in many instances probably wrong. Even though questionable from an objective perspective, this inference has in all likelihood not harmed but rather promoted the sales growth of organic products. This is related to the fact that health, just like sustainability, is a credence characteristic: it is based on information only, and it cannot be refuted by experience. Consumers who buy organic food products because they think that these are healthier may later be confronted with opinions that this is in fact not true, but can handle this by questioning the credibility or competence of the source of these opinions. Consumers can therefore continue to buy organic products for health reasons.

But inferences may be more far-reaching. Figure 4 (from Scholderer et al., 2004) shows results from a study where quality expectations regarding outdoor pig production were compared to quality expectations regarding conventional indoor production. With the exception of 'low price', respondents, on average, had higher expectations to outdoor production than conventional indoor production across all criteria. Some of these – animal welfare, no residues, domestic origin, nutritional quality – are credence characteristics like healthiness. But others, like taste, leanness, tenderness and juiciness, are experience characteristics, where expectations can be disconfirmed after the purchase.

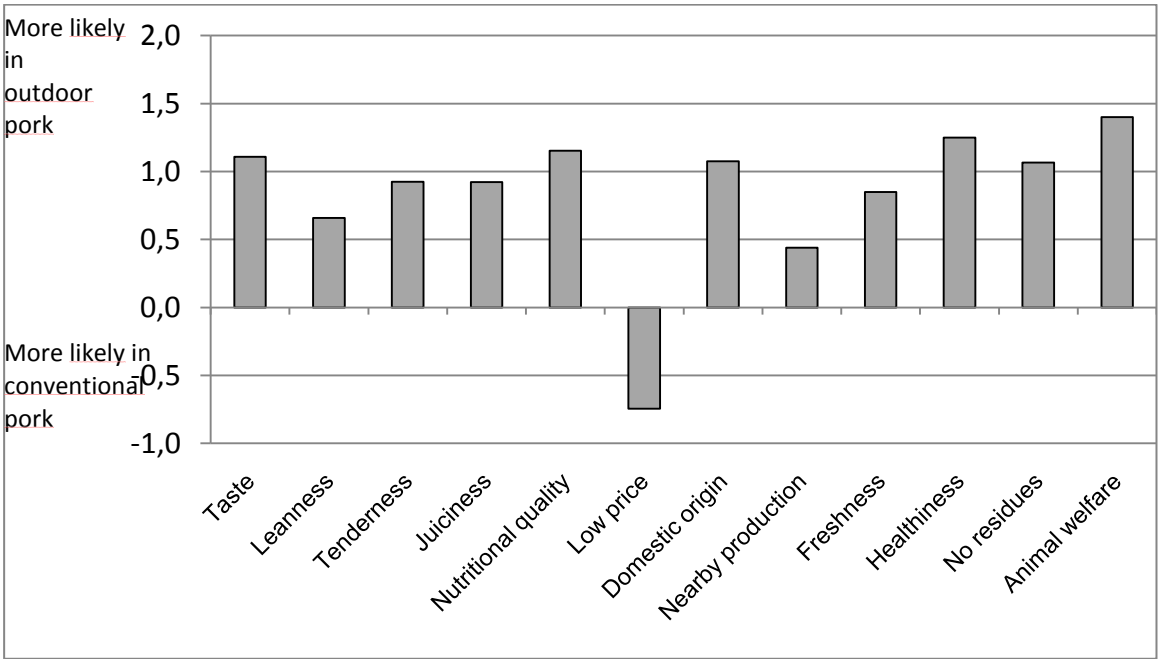


Figure 4. Perceptions of outdoor as compared to conventional pork
(adapted from Scholderer et al., 2004, Danish sample, n=664)

When consumers make inferences from an eco-label beyond what the label actually stands for, and when these inferences lead to expectations that can actually be disconfirmed by consumption, then this is a barrier for sustainable consumption. Consumers buy the eco-labelled product for the wrong reason, will be disappointed with the product after consumption, and will avoid the product – and the eco-label – in future purchases.

The obvious way out of this dilemma appears to be educating consumers on the 'true' meaning of the label, but as this amounts to a de-marketing task, such communication is attractive neither for consumers nor for suppliers. A more market-oriented approach would be to find out which bundles of benefits certain consumer segments want, and then develop product lines that deliver these benefits. When deviations from expectations are small, experience may even be assimilated to expectations and the eco-label may improve overall quality perception also after purchase and consumption (Scholderer & Sørensen, in press). However, large deviations may have the opposite effect.

6 Eco-information is traded off against other criteria: Is the price too high, the taste not good enough?

Food choice is based on multiple criteria (Grunert, 2005), and sustainability will almost never be the only one. When different criteria do compete in the mind of the consumer, we are dealing with trade-offs.

The first, and may be most important trade-off, is with price. Are consumers willing to pay a higher price for sustainable production? A range of studies has dealt with willingness to pay for sustainability and eco-labelled products. As an example, an American study found that 73% would choose the eco-labelled apple if the price was the same as a conventional apple, and that shares of choices would fall to 52% and 42% with price premiums of $.20 and $.40 (Blend & van Ravenswaay, 1999). Other studies (e.g., Belcher, Germann & Schmutz, 2007; Jaffry et al., 2004; Loureiro, McCluskey & Mittelhammer, 2002; Soler, Gil & Sanchez, 2002) find higher or lower estimates of willingness to pay, depending on the product, the information provided, the respondent profile, and the method used to measure WTP. Where cumulative experience has resulted in industry-based rules of thumb for price premiums for organic products, the same is not yet true for eco-labels more generally.

Whereas the trade-off with price may be most fundamental, trade-offs among different dimensions of food quality are possible as well. In the literature on healthy eating, the subjective trade-off between health on the one side and taste and convenience on the other side has been widely debated. We know much less about the prevalence of such trade-offs between sustainability and other quality aspects. While there is research claiming that there are consumer segments that are willing to trade off taste and other quality aspects for sustainability (D'Souza, TAghian & Lamb, 2006), research in healthy eating would suggest that the margins by which consumers are willing to compromise taste for sustainability will be narrow. With eco-labelled products being a relatively new concept, and given the positive inferences that consumers are known to make based on organic production, one could hypothesize that consumers are not likely to already have formed subjective theories about trade-offs between sustainability and especially taste, as they are reputed to have done with regard to healthiness and taste. Sustainability would then just be regarded as an added feature, and the major trade-off would be with price.

7 Lack of awareness or credibility: Can motivated consumers implement their good intentions?

It is a well-known phenomenon in attitude research that people with a positive attitude towards a certain type of behaviour not necessarily implement that behaviour, or only implement it occasionally. One possible reason for this lack of correspondence between attitude and behaviour is low perceived self-efficacy, meaning that people think it will be difficult or even impossible to implement the behaviour to which they have a positive attitude (Bagozzi, 1992; De Vries, Dijkstra & Kuhlman, 1988).

For consumers who have a positive attitude towards buying food products produced in a sustainable way, implementing this behaviour requires that it is indeed possible for the consumer to distinguish between products produced in more and less sustainable ways. Sustainability is, as noted in the beginning of this paper, a question of credible communication. Eco-labelling is supposed to have that function of empowering consumers to make the more sustainable choice and can thus contribute to raising perceived self-efficacy in making sustainable food choices to a level where implementation of this behaviour is regarded as possible. However, this requires that the consumer is aware of these labels and regards them as credible. An unknown label on a product will not be credible and will not increase perceived self-efficacy, even though it may still influence purchase behaviour by peripheral processing, as noted above. Even a known label or piece of information may not increase perceived self-efficacy when it is not regarded as a credible indicator of sustainability. For example, some product labels contain information on food miles, but the consumer may have heard that food miles are not a good indicator of sustainability after all, implying that the consumer will not feel that this information empowers him or her to make sustainable choices. Consumers may then still like the idea of supporting sustainability by their food choices, but will find it hard to do so and therefore not try,

The importance of awareness and credibility for the link between (good) intentions and actual behaviour is illustrated in figure 5 (from Thøgersen, 2002). It uses data from a Danish study conducted in 1995, a time when the Danish label for organic food (the so-called 'Ø-label') was still relatively new and therefore not universally known. Those respondents who were able to correctly identify the Ø-label among three alternatives (43% of the sample) were compared to those who could not. For both groups, the relationship between intention to buy organic milk or carrots and their actual purchase behaviour, measured as number of times they bought organic out of the 10 last purchases, was estimated. As figure 5 shows, the relationship between intentions and behaviour is considerably stronger for those respondents

who could correctly identify the organic label, showing how the transformation of intentions to behaviour depends on awareness of the eco-label.

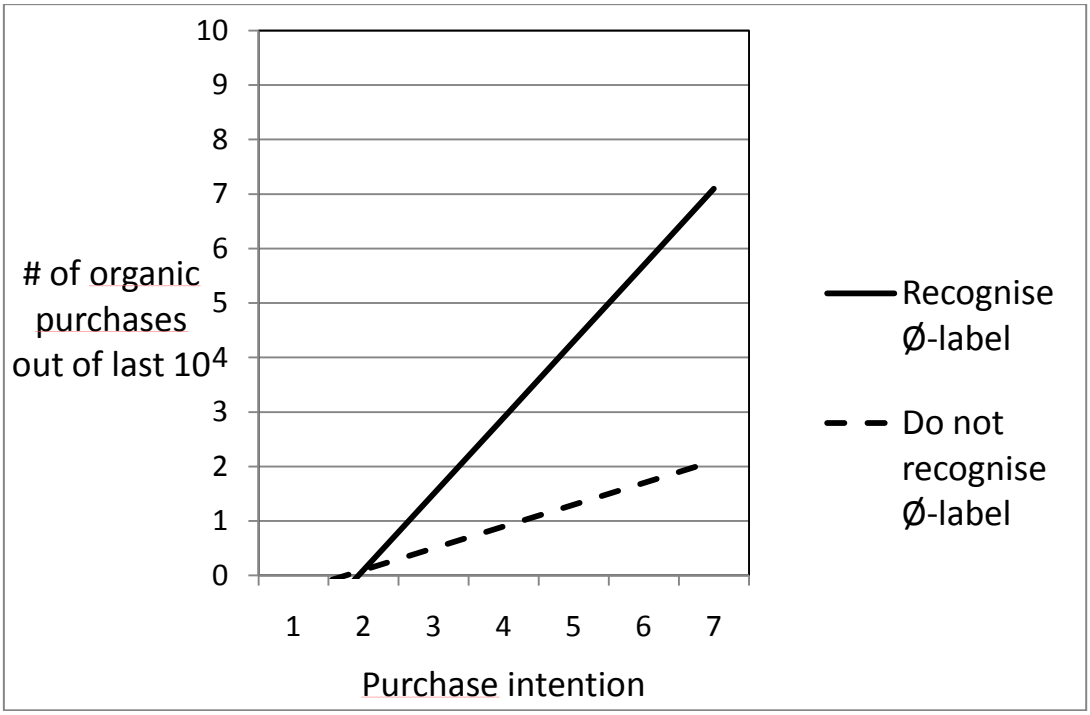


Figure 5. Awareness as a facilitator: How knowing the Ø-label moderates the relationship between intentions and behaviour for buying organic milk
(Based on Thøgersen, 2002, Danish sample, n=217)

8 Lack of motivation at time of choice: Do consumers forget about their good intentions?

Another well-known issue in the debate about the link, or lack of same, between attitudes and behaviour has to do with the strength of the attitude and its availability at the time of the behaviour (Fazio, 1986; Fazio, Powell & Williams, 1986). Strong attitudes are those that are based on many associations with the attitude object, are of high personal relevance, are based on personal experience, and have been expressed repeatedly. Strong attitudes are easily accessible in memory and will therefore usually be behaviourally relevant. If somebody has a very strong positive attitude to sustainable behaviour, sustainability will probably play a role in that person's behaviour, even though it may still be traded off against other equally important criteria.

But many people have a positive, albeit not very strong attitude towards choosing sustainable food. These people know less about sustainability, have less experience with buying eco-labelled products, do not usually express these attitudes to others, and generally find the whole issue less important. When asked about their attitude towards sustainable food choices, they will still be positive, may be even very positive. But since the attitude is weak, it is less accessible in memory and will therefore often not be relevant for actual behaviour – the attitude is dormant, it is 'forgotten' at the time of behaviour. It will influence behaviour only when it is 'activated' at the time of the behaviour.

Activation of attitudes can for example occur by doing research on the behaviour! Grankvist and Biel (2007) did a panel study on purchase of organic products in four product categories in Sweden, where purchase frequency, concern about environmental consequences of food production, and specific beliefs about the four product categories and their prices were measured four times. There was a significant increase of purchase of organic products from the first to the second and subsequent measurements, and the subgroup of respondents contributing most to this increase were those who did not report any organic purchases at time T1, but who had higher scores on concern for environmental consequences of food production. These were the respondents who were motivated to act in a sustainable way, but where this attitude was not active during purchases reported at time T1. Being part of the study, however,

activated this attitude and makes it more accessible, so that it has influence on subsequent purchases.

In a retail setting, a common marketing instrument that may activate existing attitudes is store displays. Grunert and Andersen (1999) investigated the effect of having an in-store campaign promoting organic pork during a three-week period. Sales of meat in the campaign stores and corresponding control stores were monitored, and shoppers in all stores were interviewed before and after the campaign. Analysis of the sales data showed that the campaign had a net effect of increasing the market share of organic pork by 6%. However, belief about and attitudes to organic food in general were largely unaffected by the campaign, and attitude specifically towards organic pork increased only slightly. These findings are compatible with the same mechanism of attitude activation: the campaign activated already existing positive attitudes towards buying organic food and succeeded in linking these attitudes better to actual choices made in the supermarket.

9 Perspectives

In this paper, I have discussed six barriers that may prevent consumers from recognizing and choosing the more sustainable alternatives during their food choices. I have not addressed the issue whether consumers are interested in sustainability at all. My purpose was to show that even when consumers indeed have a positive attitude to sustainable food production, there are still many reasons why they do not buy the sustainable alternatives.

The underlying theme across the six barriers is the need to communicate sustainability. The sustainable alternative must be equipped with some device that communicates to consumers that this is indeed the more sustainable alternative. In other words, the product must be eco-labelled. But eco-labelling is not enough. Consumers must notice, read and understand the eco-label, and should not make inferences that are too far off with regard to what the label actually stands for. Consumers must find the label credible. Consumers must find the label a reliable help in making sustainable choices, and they may need to be reminded of their good intentions when doing their shopping in a time-pressured, information-overloaded environment.

Various things can be done to overcome these barriers, and all stakeholders in the food sector have a role in it. Manufacturers, retailers and public bodies should work together in developing eco-labels that are clearly defined, are placed prominently on food products, and are supported by communication explaining their role and meaning. Manufacturers have an important role in developing food products that are not only produced in a sustainable way, but where consumers also find that the sustainability is not at the expense of other relevant criteria when choosing food, notably taste, convenience, healthiness and price. Retailers have an important role in giving prominence to sustainable alternatives on the shelves and providing those reminders in the store environment that help consumers remembering their interest in sustainable choices. And finally consumer researchers need to contribute by providing a better understanding of the reasons why consumers do not make sustainable choices.

References

Aertsens, J., Verbeke, W., Mondelaers, K., and Van Huylenbroeck, G. (2009). Personal determinants of organic food consumption: a review. *British Food Journal* **111**: 1140-1167.

Bagozz, R. P. (1992). The self-regulation of attitudes, intentions, and behaviour. *Social Psychology Quarterly* **55**:178-204.

Belcher, K.W., Germann, A.E., and Schmutz, J.K. (2007). Beef with environmental quality attributes: Preferences of environmental group and general population consumers in Saskatchewan, Canada. *Agriculture and Human Values* **24**:333-342.

Blend, J. R. and Ravenswaay, E. O. v. (1999). Measuring consumer demand for ecolabeled apples. **81**(5): 1072-1077.

D'Souza, C., Taghian, M., and Lamb, P. (2006). An empirical study on the influence of environmental labels on consumers. *Corporate Communications* **11**: 162-173.

De Vries, H., Dijkstra, M., and Kuhlman, P. (1988). Self-efficacy: the third factor besides attitude and subjective norm as a predictor of behavioural intentions. *Health Education Research* **3**: 273-282.

Duchowski, A. (2002). A breadth first survey of eye-tracking applications. Behavior Research Methods, Instruments & Computers **34**: 455-470.

Erskine, C.C. and Collins, L. (1997). Eco-labelling: success or failure? *The Environmentalist* **17**: 125-133.

Evans, J.S.T.B. (2008). Dual processing accounts of reasoning, judgment, and social cognition. *Annual Review of Psychology* **59**: 255-278.

Fazio, R. H. (1986). How do attitudes guide behaviour? In R. M. Sorrentino & E. T. Higgins (Eds.), The handbook of motivation and cognition: Foundations of social behaviour (pp. 204-243). New York: Guilford Press.

Fazio, R. H., Powell, M. C., and Williams, C. J. (1989). The role of attitude accessibility in the attitude-to-behaviour process. *Journal of Consumer Research* **16**, 280-288.

Grunert, K. G. (2005). Food quality and safety: Consumer perception and demand. *European Review of Agricultural Economics* **32**: 369-391.

Grunert, K. G. and Andersen, S. (1999). Markedsprojekt for økologisk svinekød. Aarhus: MAPP Centre, Aarhus School of Business.

Grunert, K. G., Fernandez-Celemin, L., Wills, J. M. B., Stefan Storcksdieck genannt, and Nureeva, L. (2010). Use and understanding of nutrition information on food labels in six European countries. *Journal of Public Health* **18**: 261-277.

Harper, G. C. and Makatouni, A. (2002). Consumer perception of organic food production and farm animal welfare. *British Food Journal* **104**: 287-299.

Jaffry, S., Pickering, H., Ghulam, Y., Whitmarsch, D., and Wattage, P. (2004). Consumer choices for quality and sustainability labelled seafood products in the UK. *Food Policy* **29**: 215-228.

Juhl, H. J. and Poulsen, C. S. (2002). Den forbrugerbaserede værdi af en mærkning med fokus på Svanemærket: Undersøgelsens design, gennemførelse og resultater. MAPP working paper no. 79. Aarhus: MAPP Centre, Aarhus School of Business.

Leire, C. and Thidell, Å. (2005). Product-related environmental information to guide consumer purchases – a review and analysis of research on perceptions, understanding and use among Nordic consumers. *Journal of Cleaner Production* **13**: 1061-1070.

Loureiro, M. L., McCluskey, J. J., and Mittelhammer, R. C. (2002). Will consumers pay a premium for eco-labelled apples?, **36**: 203-219.

Magnusson, M. K., Arvola, A., Hursti, U.-K. K., Åberg, L., and Sjödén, P.-O. (2003). Choice of organic foods is related to perceived consequences for human health and to environmentally friendly behaviour. *Appetite* **40**: 109-117.

Petty, R. E. and Cacioppo, J. T. (1986). The elaboration likelihood model of persuasion. Advances in Experimental *Social Psychology* **19**: 123-205.

Petty, R. E., Cacioppo, J. T., and Schumann, D. (1983). Central and peripheral routes to advertising effectiveness: The moderating role of involvement. *Journal of Consumer Research* **10**:135-146.

Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., and Podsakoff, N. P., (2003). Common method biases in behavioural research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology* **88**: 879-903.

Rex, E. and Baumann, H. (2007). Beyond ecolabels: what green marketing can learn from conventional marketing. *Journal of Cleaner Production* **15**: 567-576.

Scholderer, J. and Sørensen, B.T. (in press). Polynomial relations in latent-difference bifactor models: A psychometric model of assimilation and contrast. *Journal of Marketing Research.*

Scholderer, J., Nielsen, N. A., Bredahl, L., Claudi-Magnussen, C., and Lindahl, G. (2004). Organic pork: Consumer quality perceptions - Final report. MAPP project paper. Aarhus: MAPP Centre, Aarhus School of Business.

Soler, F., Gil J. M., and Sánchez, M. (2002). Consumers' acceptability of organic food in Spain. *British Food Journal* **104**: 670-687.

Thøgersen, J. (2000). Psychological determinants of paying attention to eco-lkabels in purchase decisions: Model development and multinational validation. *Journal of Consumer Policy* **23**: 285-313.

Thøgersen, J. (2002). Promoting green consumer behaviour with eco-labels. In T. Dietz & P. Stern (Eds.), New tools for environmental protection: Education, information, and voluntary measures (pp. 83-104). Washington DC: National Academy Press.