

**Research Literature relating to Nutrition Labelling and  
Product Selection at point of purchase:  
a short review and conceptual treatment**

Simon Garrett MSc. 2007

Contents

1.	<b>Executive Summary</b> .....	2
2.	<b>Introduction</b> .....	3
	2.1 Aims and Objectives.....	3
	2.2 Background .....	3
3.	<b>Method</b> .....	4
	3.1 Inclusion Criteria .....	4
	3.2 Search Methods .....	5
	3.3 Analysis.....	5
4.	<b>Findings</b> .....	6
5.	<b>Discussion</b> .....	12
6.	<b>Conclusion</b> .....	14
7.	<b>Appendices</b> .....	16
8.	<b>References</b> .....	17

**Research Literature relating to Nutrition Labelling and  
Product Selection at point of purchase:  
a short review and conceptual treatment**

Simon Garrett MSc. 2007

**1. Executive Summary:**

In the context of the current debate about the influence and format of nutritional labelling on food packages, a quick review of existing literature about consumers' use of such information was undertaken. Summary of existing review papers allowed the patterns of findings within the research to be made clear.

It was found that search for, understanding and use of nutritional labelling was most likely among consumers of higher socio-economic and educational status. Also, consumers sensitised to nutrition by having children or some interest related to personal health issues were more likely to seek such labelling. Use of information was inhibited by complex or confusing presentation, and simple graphical forms, adjectival descriptors and 'benchmarks' were considered more useful. Consumers use nutritional information to make simple comparisons or assessments based on a restricted range of the best-known nutrients.

The magnitude of the effect of nutritional labelling, and its precise location within the hierarchy of factors that effect purchase decisions has not been determined accurately within the existing literature. A Conceptual Model of food purchase decision making was formulated to inform consideration of how these aspects of the subject might be approached.

## 2. Introduction:

### 2.1 Aim and Objectives

The purpose of this paper is to establish whether any consensus has emerged from recent research into consumers' use of nutritional information from product packaging, particularly regarding decision-making at the point of purchase. More specifically to:

1. Identify relevant literature on label use, purchase decisions and understanding.
2. Summarise the findings of papers identified.
3. Derive a conceptual model locating the use of label information within the mechanism of product selection and purchase, contextualising initiatives aimed at increasing the influence of nutritional labelling.

### 2.2 Background

There is a clear responsibility, acknowledged by Government and by the majority of commercial concerns within the food industry, to empower the consumer to choose food products suitable to a health-promoting diet and way of life. Where statutory controls on the formulation of foods are philosophically or politically precluded, reliance on the individual accurately to select beneficial products may be the only available recourse. If such choices become prevalent a dual benefit may accrue: the consumer not only may improve his or her own and family diets, but also may act as a driver of change within product ranges offered by food suppliers, demanding healthier options.

It is important to consider the above in context however. There are many competing pressures seeking to modify the food-buyer's behaviour, and also many factors that restrict the choices any consumer can make. At the highest level exist cultural and religious constraints that effectively place boundaries around what is considered edible or permissible as food, and around the manner of its preparation. Further constraints limit the foods that are available in practice, in

terms both of physical availability and affordability (Wheeler 1992). Only after these high-level factors are satisfied may the consumer exercise real choices, conscious and unconscious, based on sensory factors, personal predispositions and intangible attributes such as nutrient content, responses to the latter being mediated by widely varying individual factors such as educational status.

Whilst the desirability of presenting nutritional data on food packaging is not disputed, the magnitude of its likely effect on product selection is governed by its position within the hierarchy of factors that restrict choice. A considerable body of research has sought to characterise individuals' responses to nutritional labelling and understand the factors that govern them. This paper will seek to summarise recent findings within this literature.

Changing the presentation of nutritional information on food labels with the purpose of changing purchasing behaviour is a form of health intervention; as such it would benefit from the derivation of a conceptual model of purchase behaviour, in accordance with Medical Research Council (MRC) recommendations, describing the inter-related factors that contribute to purchasing outcomes (Earp and Ennett, 1991). This would enable accurate determination of the best 'intervention points' in the system (Hardeman et al, 2005), where maximum effect might be expected.

### **3. Method:**

The large size of the research corpus in this field precluded a full review of the subject within the time available. It was decided systematically to seek pre-existing reviews, determine their quality, and synthesize their findings; description of common themes among them would provide access to any consensus existing within the source material.

#### **3.1 Inclusion criteria:**

Published review articles with satisfactorily described search methods<sup>1</sup>.

Publication dates within the last 10 years.

Articles available in English.

Articles reflecting culturally relevant populations.

'Medium-high' to 'High' quality (see appendix 1).<sup>1</sup>

### 3.2 Search methods:

Primary electronic searches were made of the following online resources using wide subject criteria in order to capture records from multiple bio-medical, social science and commercial specialisms:

**MEDLINE** and **OLDMEDLINE** via PubMed.

**JSTOR** online multidisciplinary journal archive via 'JSTOR Expert Search'.

**ISI Web of Knowledge** bibliographic search portal from Thomson Scientific.

**EBSCOhost**<sup>®</sup> bibliographic portal of EBSCO publishing.

**Scencedirect**<sup>®</sup> bibliographic search portal of the Elsevier publishing group.

**IngentaConnect** scholarly research portal of Publishing Technology plc.

**HighWire Press**<sup>®</sup> bibliographic search portal of Stanford University.

**Cochrane Library** via its Wiley Interscience<sup>®</sup> search portal.

See Appendix 2 for search details.

Reference lists of articles located were checked for further relevant papers. Some material was provided directly by the Food Standards Agency.

### 3.3 Analysis:

Eligible reviews were read with reference to three basic questions:

1. Do consumers seek nutritional information from food labels?
2. Do consumers understand nutritional information on food labels?
3. How do consumers use nutritional information on food labels?

Where identified in the text, relevant findings were recorded in a pro-forma summary table.

<sup>1</sup> This Criterion was waived in respect of Drichoutis et al (2006) – see Appendix 1

**4. Findings:**

The search procedure yielded a total of four review papers that satisfied the inclusion criteria. Time constraints limited the search to mainstream sources, so there is probably scope for additional work capturing fringe material and work carried out in the commercial sector. The papers selected for review, and their principle findings, are as follows:

**European Heart Network (2003) *A Systematic review of the research on consumer understanding of nutrition labelling*, EHN, Brussels.**

<b>Summary of findings: 130 studies included in review</b>		
<b>Do consumers seek nutritional information from food labels?</b>	<b>Who?</b>	<p>Most people claim to.</p> <p>Men are less likely than women to report an interest.</p> <p>Women with higher incomes are more likely to, as are people with higher educational attainment.</p> <p>Those with a “special interest” in or “positive attitude” to diet are more likely to.</p>
	<b>When?</b>	<p>When time permits.</p> <p>When foods are unfamiliar.</p>
<b>Do consumers understand nutritional information on food labels?</b>	<p>Label users report partial understanding.</p> <p>Familiar formats for information are preferred.</p> <p>“Benchmarks” against which to judge nutrient levels are favoured.</p> <p>“Adjectival descriptors” (e.g. ‘low fat’) perform best in objective tests.</p> <p>“Fat” and “calories” are the best understood terms.</p> <p>Serving sizes are “difficult to interpret”.</p> <p>Guideline Daily Amount or reference intake values are “useful”</p>	

<p><b>How do consumers use nutritional information on food labels?</b></p>	<p>To assess unfamiliar foods.          To “avoid certain nutrients”.          To assess the “specific nutrient content” of different products.          To make comparisons between similar products.</p>
--	--

**Cowburn and Stockley (2004) *Consumer understanding and use of nutrition labelling: a systematic review*, Public Health Nutrition, 8(1), pp 21-28**

<p><b>Summary of findings: 129 studies included in review</b></p>					
<p><b>Do consumers seek nutritional information from food labels?</b></p>	<table border="1"> <tr> <td data-bbox="587 786 722 1010"> <p><b>Who?</b></p> </td> <td data-bbox="722 786 1394 1010"> <p>Women, those on a higher income and those of higher educational attainment.            Those with a special interest in or positive attitude to diet.</p> </td> </tr> <tr> <td data-bbox="587 1010 722 1193"> <p><b>When?</b></p> </td> <td data-bbox="722 1010 1394 1193"> <p>When not subject to time pressure.            When information is easily legible and comprehensible.</p> </td> </tr> </table>	<p><b>Who?</b></p>	<p>Women, those on a higher income and those of higher educational attainment.            Those with a special interest in or positive attitude to diet.</p>	<p><b>When?</b></p>	<p>When not subject to time pressure.            When information is easily legible and comprehensible.</p>
<p><b>Who?</b></p>	<p>Women, those on a higher income and those of higher educational attainment.            Those with a special interest in or positive attitude to diet.</p>				
<p><b>When?</b></p>	<p>When not subject to time pressure.            When information is easily legible and comprehensible.</p>				
<p><b>Do consumers understand nutritional information on food labels?</b></p>	<p>Most can “locate and retrieve” simple information. Partial understanding is achieved but “in general they reported finding nutrition labelling confusing” especially “technical” and “numerical” information.          Relationships NOT well understood between:</p> <ul style="list-style-type: none"> <li>- Calories and energy</li> <li>- Sodium and salt</li> <li>- Sugar and carbohydrate</li> </ul> <p>Understanding poorer with increasing age.          Understanding poorer with lower educational attainment.          ‘Benchmarking’ of nutrient intakes is useful to consumers.</p>				
<p><b>How do consumers use nutritional information on food labels?</b></p>	<p>To make simple comparisons between products, sometimes using a few as one or two nutrients.</p>				

**Grunert (2006) *A review of research on consumer response to nutrition information on food labels*, European Food Information Council, Brussels.**

<b>Summary of findings: 15 studies included in review</b>		
<b>Do consumers seek nutritional information from food labels?</b>	<b>Who?</b>	<p>Women more so than men.</p> <p>Parents of children living at home are more likely to.</p> <p>Older people are sometimes interested because of specific health concerns.</p>
	<b>When?</b>	<p>When foods, particularly processed foods have “low transparency” e.g. ready meals.</p> <p>When foods are unfamiliar.</p> <p>When there is no time pressure.</p>
<b>Do consumers understand nutritional information on food labels?</b>		<p>Understanding is hampered by patchy and often confused nutritional knowledge among consumers, health messages being incompletely understood or misinterpreted.</p> <p>Research on “perceived understanding” of labels is equivocal.</p> <p>Obstacles to understanding include poor legibility, obscure terminology, small font sizes, multi-lingual labels and lack of standardisation of formats.</p> <p>Front of pack signposting rated as easy to understand with no clear advantage among rival formats.</p>
<b>How do consumers use nutritional information on food labels?</b>		<p>Research to date allows “next to no understanding of how labelling information is/will be used in a real world shopping situation.”</p>

**Drichoutis et al (2006) *Consumers' use of nutritional labels: a review of research studies and issues*, Academy of Marketing Science Review, volume 2006, no 6.**

<b>Summary of findings:</b>		
<b>Do consumers seek nutritional information from food labels?</b>	<b>Who?</b>	<p>Higher-educated people more likely to.            Females more likely to.            Those with a “special interest in diet” or an awareness of diet related disease are more likely to.            Households with preschool children and married households more likely to.            Non-city or rural dwellers are more likely to.            Equivocal evidence about the effect of age and of household size.            Those who attend closely to price are less likely to search for nutritional labelling.</p>
	<b>When?</b>	<p>When unrestrained by time pressures.            When doing major grocery shopping rather than meal planning.</p>
<b>Do consumers understand nutritional information on food labels?</b>		<p>“Consumers do not perform well when they have to do math calculations or handle quantitative information”.            ‘Traffic light’ or similar formats are “preferred by consumers”.            Graphic or coloured formats are recommended.            Energy and fat are the most looked for components.            Use of technical language and units may deter or truncate consumers’ searches for information.            Confusion over health claims and nutrient contents; equivocal findings regarding the interaction of the two.            “Per 100 grams” preferred over “per serving”</p>
<b>How do consumers use nutritional information on food labels?</b>		<p>Consumers look for “negative nutrients” so as to avoid them.            Nutrient information in respect of a range of products may have a cumulative effect on perceived brand values.</p>

All of the above reviews included an eclectic mixture of study designs from diverse sources, including some research carried out for food producers and retailers. Qualitative and some quasi-quantitative studies were included, but heterogeneous study designs precluded formal meta-analyses of the data. European Heart Network (2003) and Cowburn and Stockley (2004), although differently nuanced at publication, refer to the same body of reviewed literature. Grunert (2006) has the expressed purpose of updating the work of Cowburn and Stockley for the European Heart Network (EHN). The Drichoutis (2006) paper does not include a description of its search criteria, a frustrating failing since the material included in its findings is different from that informing the others and knowledge of how it was sourced would be useful.

The common themes identified in all the reviews are as follows:

- (a) Women are more likely than men to seek and use nutritional information on food labels.
- (b) Higher incomes and higher educational attainment are identified as factors that increase the likelihood of seeking and using nutritional information on food labels.
- (c) Consumers with a special interest in diet or nutrition, or knowledge of the links between diet and disease, are more likely to seek and use nutritional information on food labels.
- (d) Lack of time at the point of purchase is identified as a major limitation on the extent to which nutritional information from labels is sought and used.
- (e) Parents with children living at home are more likely to use nutritional label information.
- (f) Consumers placing importance on price are less likely to attend to nutritional labels.
- (g) Simpler formats that do not rely on numerical information or scientific units, and that present easily assimilated information using colour or graphics, are preferred by consumers. Some nutrients (e.g. fats) have a higher public 'profile' and tend to be looked at first, sometimes to the exclusion of others. Confusion frequently exists about synonymous or related terms, i.e. salt/sodium, energy/calories, sugar/carbohydrate.

- (h) When trying to judge how well a food would fit into the overall diet, those who use nutritional information prefer to be offered a 'benchmark' of some kind to assist them.

In addition there are more equivocal findings about the effects of age. An older person may be sensitised to the health risks associated with fat or cholesterol by medical advice or targeted health education, and therefore may seek specific information. Conversely, older people may be more resistant to novelty than the young, and thus less likely to attend to additional on-pack information. Many factors identified as having an influence on label use are closely inter-related; higher education, high income and relative freedom from time pressures tend to coincide in certain individuals and social groups. Equally, a positive attitude to diet and nutritional information, identified as a predisposing factor to the use of label information, may be inhibited among those deprived of the time and resources required to exercise it.

The uses made of nutritional information on food labels may be characterised as **comparison** and **assessment**. In the case of comparison, consumers seem willing to use nutrient content to judge between similar foods, perhaps like products from different ranges or brands. In assessment, a novel food is examined to see how it might fit into the existing diet, or a habitual food may be re-assessed in the light of a health-related anxiety. In both cases it is likely that only part of the information presented will be used to make the judgement (Cowburn and Stockley, 2004). EHN (2003) and Drichoutis (2006) refer to the tendency for consumers to use labels to help them avoid 'risky' nutrients. Grunert (2006) is very specific in stating that his review of the literature did not make possible any real understanding of how label information affects purchase behaviour, or how it may influence consumers' dietary patterns.

## 5. Discussion:

The Medical Research Council (MRC) (2000) sets out a framework to inform the development of health research projects and interventions, recommending a stepwise progression from a theoretical prediction of how a health outcome might be approached to the eventual implementation of a long-term strategy. The second phase of this process is the production of a model of underlying mechanisms the intervention seeks to influence. It is clear that the mechanism of food selection and purchase is very complex and that decision-making by the individual is the product of a complex of interlocking factors. Initiatives concerned with enhancing the effect of nutritional labelling on purchase decisions would benefit from a model derived in accordance with MRC recommendations. Both Grunert (2006) and Drichoutis (2006) include diagrammatic schema within their papers.

The reviews summarised above afford some appreciation of the place of nutritional labelling of food products in the purchasing process, since the common themes uncovered ('a' to 'g' above) can all be related to factors operating in and upon the consumer to limit the influence of nutritional information. A new working conceptual model of influences on purchase decisions is presented in Figure 1, derived from the literature. In this model a broad distinction is made between 'Primary Constraints' on food selection, operating on an environmental level and outside the immediate control of the individual, and 'Personal Operators', acting within the individual and contributing to his or her conscious or unconscious choices. The principal Primary Constraints are cultural and physical (geographical) and effectively limit the range of choices open to the individual. Included here is the factor of 'affordability', market prices interacting with transport costs to reduce shopping options for many consumers. Over extended time Primary Constraints are subject to change, either through the individual's efforts to change his or her status or through secular change in the environment, but in respect of any single purchase decision they represent a fixed context.

Personal Operators within the model are diverse. They represent the dynamic interaction of factors such as gender, age, family, health, socio-economic status,

education and skills, some of which are fixed, and their manifestation as attitudes to the World. Knowledge, beliefs, interests and tastes inform the decision-making process inherent to purchasing, and mediate the way in which label information is factored into it. Some such Operators are realistic targets for initiatives seeking to affect purchasing decisions and bring about behavioural change, notably those which feed into beliefs about foods or enhance knowledge about nutrition and health. In the context of this working model, nutritional information presented on food labels might be seen as a raw material in the decision-making process, to be processed, with greater or lesser effects upon the outcome, as permitted by the predisposition of the consumer. A better analogy might be to cast nutritional labelling in the role of catalyst, enabling the decision process where the reactant factors of an informed, receptive consumer and a health-promoting product are present.

It is important to recognise that nutritional labelling is a subsidiary feature of manufacturers' and retailers' presentation of products to consumers. It may be obscured by marketing and promotional efforts, on-pack imagery, health claims (e.g. 'healthy options'), attributions regarding provenance (e.g. 'organic' status, 'local' produce, 'sustainability'), and claims to high quality (e.g. 'premium', 'finest', 'luxury'). There are also brand values that colour consumer perceptions; many consumers use trusted brands as a shortcut to perceived quality and product integrity. These other features compete for the attention of the consumer and may contribute to 'information overload'.

The constraints and operators outlined in Figure 1 have an overall effect on the extent to which a consumer will search for nutritional information and thus increase his or her likelihood of being exposed to it (Grunert 2006). The effect of such exposure on purchasing behaviour is then mediated by operators that affect the assimilation and use of that information. A final, emergent operator is that of experience. If a selected product is found to be palatable or to impart some perceived benefit it may subsequently be chosen again, and it may increase the likelihood of similar or similarly branded products being chosen via a 'halo' effect. Equally a negative experience may de-value nutritional information as a selection criterion. In terms of behaviour change the effects are unpredictable; a consumer

may make a 'healthy' choice based on nutritional information regarding one product and then reward him or herself with an indulgent choice elsewhere.

The literature reviews summarised herein suggest patterns in the ways in which nutritional labelling can affect purchasing decisions, and indicate some of the obstacles to such effects. It would be desirable to refine their findings, perhaps through the application of a meta-analytical approach to the source data; the diversity of the original research means that this would be a considerable challenge. It is probable that there is additional source literature that could contribute to our understanding, particularly with regard to the actual process of the purchasing decision and the extent to which it is conscious or unconscious. A 'scoping search' (Centre for Reviews and Dissemination, 2004) carried out to explore this option indicated a diverse body of literature but found no existing reviews of it.

## **6. Conclusion:**

The time available for the preparation of this paper did not permit an in-depth search for new material to inform consideration of the role of nutritional labelling in food purchasing decisions. It was possible however to establish that clear trends in consumer behaviour are widely reported, and that these indicate that prosperous, well educated people, especially parents and women, are most likely to seek nutritional information from food labels and to be able to interpret it usefully. Those pressured by time or placing a high importance on price are less likely to do so. These insights are not surprising, but their prevalence is important. It is possible that the price-sensitive and harried shopper is most likely also to belong to the groups within society most at risk of diet-related ill health.

The formulation of a working conceptual model derived from the literature of factors affecting food purchase decisions is justified by the complexity of the processes that take place at point of purchase. Whilst it is possible to envisage a hierarchy of factors that feed into the decision process, and to conclude that that hierarchy will differ between individual consumers and between different shopping trips by the

same individual, the really elusive goal would be an assessment of the relative magnitude of the influence each factor has. If this information could be extracted from the available material, or sought in new experimental studies, the potential value of nutritional labelling initiatives might more accurately be assessed.

## **Appendix 1: Quality Criteria**

The quality criteria applied were those also used in EHN (2003), being as follows:

Was the review conducted using transparent and replicable methods?

Did it trawl for information that was as comprehensive as possible?

Did it address a clearly focussed issue?

Did the studies that were included address the review's question?

Were the important relevant studies included, as far as it was possible to ascertain this?

Did the authors assess the quality of the studies included?

Were all of the important outcomes considered (both negative and positive)?

Quality Banding:     High Quality – meet all criteria  
                          Medium-high – intermediate  
                          Medium Quality – meet half of criteria  
                          Medium-low – intermediate  
                          Low Quality – meet no criteria

Note: The Drichoutis (2006) study was provided for inclusion by the Food Standards Agency. It was deemed important enough to warrant inclusion despite its insufficiently clear statement of methods.

## **Appendix 2: Search terms**

Although input format varies between databases, the following search strings or variants thereof were used:

(food OR nutrition\* OR nutrient OR ingredient\*) AND

(label\* OR panel\* OR information\* OR pack\*) AND

(consumer\* OR purchaser\* OR point-of-purchase OR point-of-choice OR choice\*)

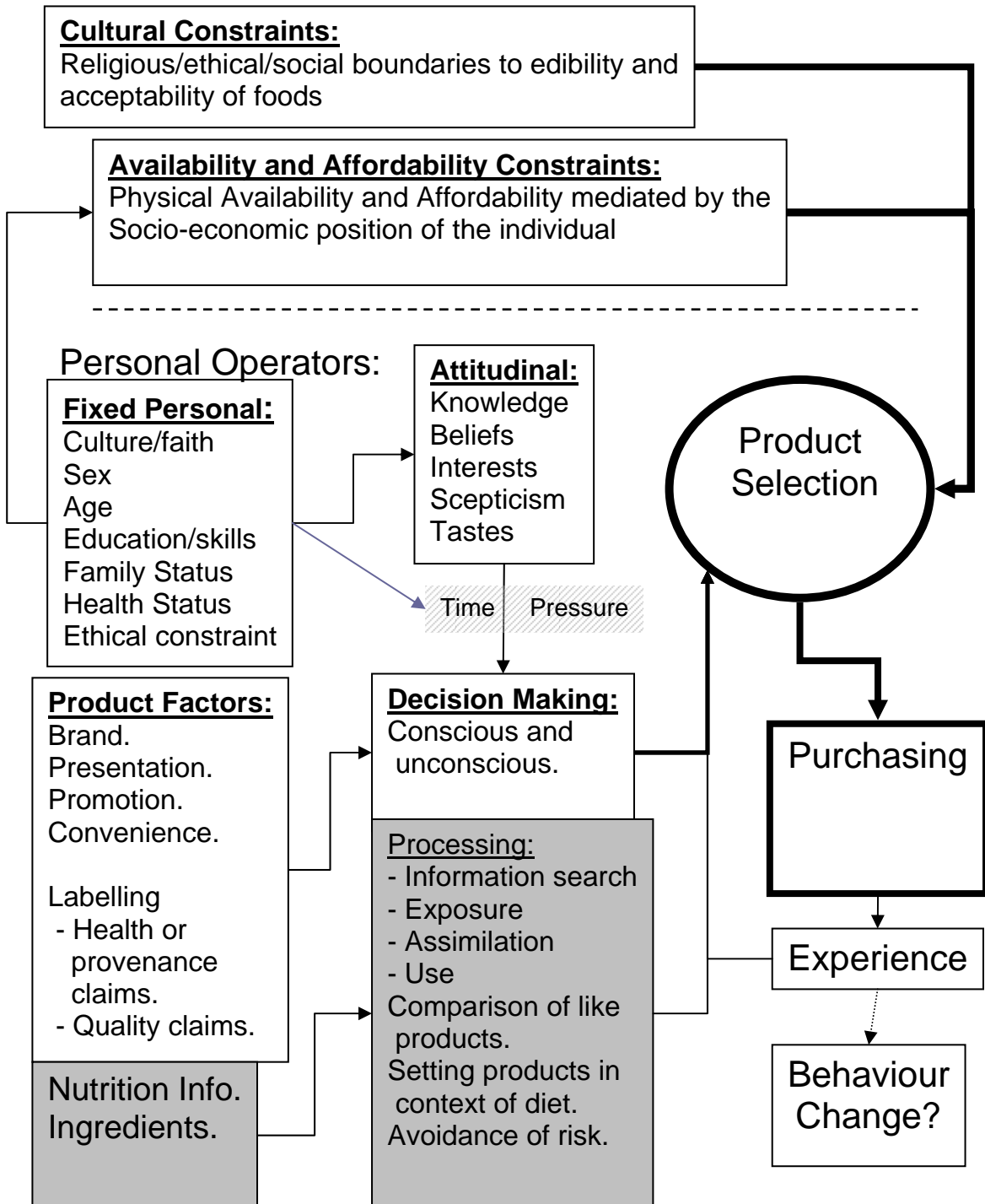
Search limits were set to include papers in ENGLISH only and, where possible to restrict searches to REVIEWS only. Search outputs were perused for relevance by TITLE and, if necessary by ABSTRACT.

## **References:**

- Centre for Reviews and Dissemination 2004 Finding studies for systematic reviews: a checklist for researchers <http://york.ac.uk/inst/crd/revs.htm> 10-03-07
- Cowburn G. and Stockley L. 2004 Consumer understanding of nutrition labelling: a systematic review Public Health Nutrition 81(1), 21-28
- Drichoutis A.C. Lazaridis P. Nayga R.M. 2006 Consumers' use of nutritional labels: a review of research studies and issues Academy of Marketing Science Review <http://www.amsreview.org/articles/drichoutis09-2006.pdf> 10-03-07
- Earp J.A. and Ennett S.T 1991 Conceptual models for health education research and practice Health Education Research 6(2), 163-171
- European Heart Network 2003 A systematic review of the research on consumer understanding of nutrition labelling EHN, Brussels
- Grunert K.G. 2006 A review of research on consumer response to nutrition information on food labels European Food Information Council, Brussels
- Hardeman W. Sutton S. Griffin S. Johnston M. White A. Wareham N.J. Kinmonth A.L. 2005 A causal modelling approach to the development of theory-based behaviour change programmes for trial evaluation Health Education Research 20(6), 676-687
- Medical Research Council 2000 A framework for development and evaluation of R.C.T.'s for complex interventions to improve Health MRC, London
- Wheeler E. 1992 What determines food choice and what does food choice determine? in Tomorrow's Food: The British Nutrition Foundation's Nutrition Bulletin Jul-92(17), Supp.1, 65-73

**Figure 1: Food purchase constraints and operators**

Primary Constraints:



© Simon Garrett 2007