

Viewpoint

The information needs and labelling preferences of food allergic consumers: the views of stakeholders regarding information scenarios

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The information provision to food allergic consumers might be improved if new information and communication

technologies were used to optimise traceability of potentially allergenic ingredients. Eight different information scenarios were developed, and their feasibility of application in European food chains discussed with different interested food chain actors in five European countries. The standardised label was chosen as a first preferred scenario, although participants were also positive about the feasibility of introducing novel ICT approaches to traceability and information delivery. Concerns were raised about accountability, upkeep of food allergy data bases, and the additional costs for the services to the food industry.

Introduction

At the present time, the only way to manage food allergy is complete avoidance of the allergens that may be present in specific food products (Astwood & Fuchs, 1996; Eigenmann, 2001; Hourihane, 2001; Pumphrey, 2000; Sampson, 2001; Taylor & Hefle, 2001). Primary prevention of allergic responses in vulnerable populations decreases the incidence of allergic responses, and reduces the socio-economic burden of food allergy for food allergic consumers (De Blok *et al.*, 2007; Van Putten *et al.*, 2006). In order to protect food allergic consumers, the effective labelling of ingredients in food products is essential, as it is intended to be the primary source of information to (food allergic) consumers in general, as well as to food allergic consumers (Eigenmann, 2001; Taylor & Hefle, 2001). The prevalence of self-reported food allergy in adults runs at 25% of the population (Miles, Fordham, Mills, Valovirta, & Mugford, 2005), although other estimations mention 5–8% of the children and 1–2% of the adults diagnosed to suffer from a food allergy (Buttriss, 2002; Rona *et al.*, 2008; Sicherer, Noone, & Munoz-Furlong, 2001). A food allergic reaction may not only cause uncomfortable skin reactions (such as itching or rashes), but may also result in severe and, indeed, potentially fatal reactions, such as anaphylactic shock (Buttriss, 2002). Thus, both individual consumers and the food industry are likely to benefit from improved labelling of food allergens.

In November 2005, a new EU directive was issued, requiring the food industry to list 12 potential allergens when these are present in food products (EU directive 2003/89/EC amending 2000/13/EC). The list of allergens includes egg, milk and dairy products, fish, gluten, peanuts, tree nuts crustaceans, soy, celery, sesame seed, sulphites,

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and mustard (Annex IIIa). Lupine and mollusc have been included on this list since 2006. Together, these allergens cause 90% of all food allergic reactions (www.eufic.org). The EU has made continuing improvements which benefit food allergic consumers. It is now required that ingredients derived from major EU allergenic foods should be declared on the ingredient list by source e.g. celery oil or soybean lecithin, with some exemptions based upon safety data. This new requirement will provide additional information to allergic consumers to aid them in their purchasing decisions. If a product consists of more than 2% of a finished product predetermined by the EU, the total content must be labelled (Annex IIIa). This new requirement will provide additional information to allergic consumers to aid them in their purchasing decisions.

Some stakeholders are not convinced that the new labelling legislation provides sufficient information to food allergic consumers (Miles, Valovirta, & Frewer, 2006; Mills *et al.*, 2004). Due to fear of cross-contamination in the absence of accurate “precautionary” or “may-contain” labelling food allergic consumers are uncertain about product safety, and may not be able to understand or interpret the information on the food labels (Cornelisse, Voordouw, Yiakoumaki, Theodoridis, & Frewer, 2007; Grunert & Wills, 2007; Miles *et al.*, 2006). For food allergic consumers, unintentional exposure to allergens when eating outside in restaurants and other catering outlets outside the home is particularly problematic, as unintentional exposures to problematic allergens may occur. Food allergic consumers cannot eat outside without making special arrangements with caterers or social contacts (Sicherer *et al.*, 2001).

The availability of foods sold loose, usually unlabelled, represents a considerable risk to food allergic consumers (Mills *et al.*, 2004). Consumer perceptions regarding inadequate labelling are reinforced by the consumer perception that there is a general lack of information about potential food allergens included in food products (Cornelisse *et al.*, 2007; Joshi, Mofidi, & Sicherer, 2002; Mills *et al.*, 2004; Nielsen, 2005). Despite this, food allergic consumers report feeling overwhelmed by the total amount of food-related information currently available (for example, information dealing with nutrition, other ingredients, and different production methods as well as allergy information) (Cornelisse *et al.*, 2007; Joshi *et al.*, 2002; Mills *et al.*, 2004; Nielsen, 2005). For these reasons, labels should be comprehensive and should deliver targeted information which directly meets the needs of food allergic consumers (Miles *et al.*, 2006; Simons, Wiess, Furlong, & Sicherer, 2005; Wood, 2002).

There is circumstantial evidence to support the idea that improved allergen labelling would benefit food allergic consumers. Food allergic and food-intolerant consumers report spending more time in the supermarket to find products they can safely eat, which potentially has a negative impact on their quality of life and economic functioning (Berstad,

Arslan, Lind, & Florvaag, 2005; De Blok *et al.*, 2007; Knibb *et al.*, 2000; Primeau *et al.*, 2000).

In a previous study, 40 Greek and Dutch food allergic consumers (or parents of food allergic children) were interviewed during the course of their grocery shopping (Cornelisse *et al.*, 2007). At the end of the shopping experiment, these consumers were presented with a range of new information scenarios for delivering information about food allergy, and questioned regarding their preferences for information delivery. Based on the opinions of the study participants, eight scenarios were developed that have the potential to help the food allergic consumer, which would have a realistic implementation chance in food shopping environments (unpublished data). The research described in this paper focuses on the feasibility of implementing novel strategies for communicating about food allergens from the perspective of stakeholders — industry, government, retailers and patient organisations — involved in the relevant food chains.

An information scenario is a combination of different information attributes which can be used to communicate with the food allergic consumer. These information scenarios have the potential to rapidly deliver personalised information to consumers in a format they prefer. The scenarios include booklets and new label design, but also the use of Information and Communication Technology (ICT) and new traceability techniques such as Radio Frequency Identification (RFID)¹. The information scenarios were discussed by different stakeholders in order to identify the views of all stakeholders regarding potential barriers and critical success factors for these scenarios.

The main objective was to test the implementation potential of information scenarios from the perspective of food chain actors and end-users. The study took place in five different European countries in order to assess the feasibility of implementing the different information strategies at a pan-European level (which more closely reflects the reality of food chains across the European market and consumers travelling across different countries). The feasibility of introducing new ICT applications to deliver information about food allergens to all end-users, particularly consumers, is also discussed.

Methods

Focus groups are a tool for collecting qualitative data from group discussions. The aim is to collect in-depth qualitative information about a group's perceptions, attitudes, and experiences on a topic exploiting group processes in order to encourage people to explore and clarify their views (Kitzinger, 1995). The main reason for conducting focus groups is to understand and explain the meanings, beliefs, and cultural factors that affect individuals' feelings, attitudes and behaviours (Rabiee, 2004). A focus group

¹ RFID: Radio Frequency Identification is a generic term that is used to describe a system that transmits the identity (in the form of a unique serial number) of an object or person wirelessly, using radio waves.

provides the researchers an opportunity to quickly identify the full range of perspectives held by the participants. Participants are provided with the possibility to interact with each other and to clarify or expand upon their contributions and explain their motivations (Powell & Single, 1996; Van Dillen, Hiddink, Koelen, de Graaf, & Van Woerkum, 2003).

The participants of the focus groups were selected because they are a purposive sample of a group being ‘focused’ on a given topic (Rabiee, 2004). Key stakeholders from five different countries (The Netherlands, Greece, Germany, Spain and Poland) were identified. These included professionals with an interest in food processing, food retailers, caterers, researchers in research institutes (e.g. Fraunhofer in Germany and TNO in the Netherlands) and laboratories (e.g. allergy analytical companies such as Eurofins), as well as regulators with an interest in food allergy, and representatives of food allergy patient groups.

A semi-structured interview protocol questionnaire was developed, which included both general and specific questions. Stakeholders answered questions about their experience with providing information to food allergic consumers and expressed their first impression about the eight information scenarios. The questionnaire was sent to the stakeholders before the focus groups were held to elicit an initial statement regarding perceptions of, and beliefs about, the different information scenarios. Table 1 provides an overview of the stakeholders responding to the questionnaire.

The questionnaire was completed by 55 stakeholders before or at the focus group. The results were analysed and summarised to provide input into the protocol for the focus groups to be held with stakeholders. In addition, the results were used to prepare a presentation which was translated into all five languages, which was used to introduce the focus group discussions to stakeholders.

In the focus groups, stakeholders discussed the eight information scenarios and exchanged their views about how useful and feasible they thought they would be. The focus group meetings took place between June and October 2006 and took between 2.5 and 4 h each. Within each country, the focus groups consisted of between 8 and 14 stakeholders. The discussions were taped, transcribed and translated into English for further analysis. The transcripts were analysed to identify which of the information provision approaches were preferred by stakeholders, together

with the reasons for these preferences, as well as potential differences in opinion between the different countries. Box 1 gives an overview of the eight information scenarios.

These scenarios reflect both the information needs of food allergic consumers and the potential provided by novel ICT driven information delivery systems, in conjunction with improved traceability systems, to deliver this information to consumers in a usable and understandable form. Besides understanding consumer preferences for different information delivery approaches, it is also necessary to understand the views of stakeholders – e.g. in the food industry and government – regarding whether or not they would be willing to implement the different approaches.

Information needs and labelling preferences of food allergic consumers: the views of stakeholders regarding information scenarios

In all the countries included in the study, stakeholder responses to the questionnaire showed that their experiences regarding the information needs of food allergic consumers had taken place as a consequence of the debate over labelling. Branching out from labels, some had used telephone “hotlines”, e-mails or the Internet to inform allergic consumers about potentially problematic foods and ingredients. The majority of respondents (69%), however, had not implemented or considered technical equipment for the information transfer. A very small minority had considered implementing infoscreens (4%), a Personal Shopping Assistant (4%), a Handheld Scanner (7%) or RFID (4%).

In the focus group meetings, the stakeholders discussed the different information scenarios, exchanged their views on feasibility regarding implementation of technical equipment and possible technical constraints, and advantages and disadvantages of the different approaches both for their organisations and for food allergic consumers.

Besides the possibilities associated with broadening (such as advertisements) the information about specific products available on the *Personal Shopping Assistant* (PSA), stakeholders were very positive about the possibility of tailoring information according to the needs of individual allergic consumers (62% positive). The immediate and direct response to the consumer’s information request was thought to be very good.

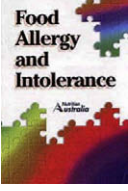
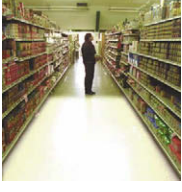
‘The positive thing about this is that you have a very direct response. You scan your product and you know right away if you can have it or not and the information could be quite extensively if you want. That is for sure a good thing’ (NL, P1 retail).

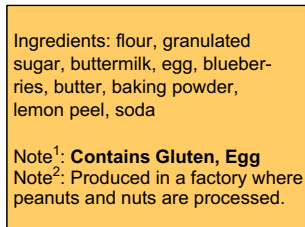
Stakeholders also suggested that the term ‘personal’ should be used carefully because there may be more food allergic consumers in one family. The use of the smart card should take account of all allergies within one family. Another issue mentioned was that the use of a PSA in the supermarket would be quite eye-catching (and potentially “stigmatising” for the people using it) and potentially

Table 1. Pattern of responding stakeholders via questionnaire or focus group meeting

Level	D	NL	GR	PL	ES	Sum
Retail/wholesaler	1	1	3	3	1	9
Manufacturer/Caterer	2	2	2	2	0	8
Raw ingredients manufacturer	2	0	2	0	0	4
Support groups	3	2	2	0	2	9
Authorities	2	3	3	0	1	9
Others (research, laboratories, IT, etc.)	4	6	0	3	3	16
Sum	14	14	12	8	7	55

Box 1. Overview of information scenarios presented to stakeholders

Information scenario	Description
1 Personal Shopping Assistant (PSA) 	A small computer with information database on allergic details. The PSA can be placed on the supermarket trolley. The information made available on the PSA will be linked with the product <i>via</i> EAN 128 or RFID (which is assumed to be on the package in the future). The information can be individualised by using a registered customer (smart) card. The consumer will get the information at the time of product selection.
2 Handheld Scanner (HHS) 	The consumer will use the scanner to get ingredients/allergy information <i>via</i> the product bar-code directly from the products. The consumer will get the information on the screen of the scanner at the time of product selection.
3 Information terminal in supermarket 	The consumer will use a touch screen which provides various options. They can choose a specific option by touching the screen. The machine provides product/ingredients/allergen information. The consumer can also obtain information about the product's location in the shop itself.
4 Information booklets 	Booklets with information about food products and food allergy which are freely available in the shop.
5 Special aisle for allergen-free products 	A special aisle for food allergic consumers in the supermarket. The consumer can find allergen-free products and extra information in a special corner of the supermarket.
6 Training of staff 	Train dedicated personnel in the supermarket as contact persons regarding food allergy and potentially problematic products.

Information scenario	Description
7 Internet shop 	Internet shop (with access available in the supermarket). The food allergic consumer can order specific products on a computer which will be delivered to the supermarket for customer collection.
8 Standardised labelling and/or symbols 	Standardised labelling and/or symbols on all food products. Allergy information could be located close to the ingredients list. Universally recognised symbols could be located on the front or back of the package.

difficult to use when, for example, a child is sitting in the trolley.

In the German focus group, the consequences of combining the PSA and Radio Frequency Identification (RFID) were discussed. At the present time, the RFID tags are not used to facilitate ingredient traceability on specific products due to their high cost. Specifically, it was stated that the price of food products would double due to the price of the tag and the associated logistics regarding introducing RFID tags in the supermarket. Against this, an RFID tag can make a single package identifiable, which would facilitate the delivery of individualised consumer information.

‘The whole aim of RFID is Individual Uniqueness of a product. RFID has without doubt a specific benefit. But we have to be clear on the data volume behind this technology. What data shall we transport?’ (DE, P6, IT).

The main problem with the PSA would be the extent to which the central database could provide accurate allergen information. The question arose as to who would be in charge of keeping the database up-to-date, as well as who would pay for it. However, it was agreed that the government should enforce and regulate the database.

Stakeholders indicated that a potential problem with all ICT information scenarios would be the difficulty of use by people not used to working with computer technology.

‘In general, we are in favour of the PSA, but only for those who are interested in it and are able to use it. Because my father who is 65 years old wouldn’t be able to use it’ (GR, P9, regulators).

‘The elderly won’t like to learn how to use it, but ultimately in future they have to learn to use that too’ (PL, P5, regulators).

Another concern about ICT information scenarios was the potential lack of security of consumer information, i.e. *privacy issues*. Consumer organisations and consumers in Greece were concerned that ICT-based information scenarios, and the PSA in particular, might be used to gather data about them that they had not agreed to disclose. However, in a potential trade-off between privacy and safety, stakeholders favoured the latter; in other words, consumer organisations thought that it was better to be safe and lose part of one’s privacy than have privacy and no food safety.

The discussions about the *Handheld Scanner* (HHS) were quite similar to the discussions about the PSA, however, most stakeholders viewed this scenario being limited compared to the PSA (42% positive). It would provide little information and it could for example not include marketing strategies (like advertisements on the PSA). The logistics would be the same as for the PSA. However, the information which could be provided to consumers would be clear, complete and could be obtained quickly by consumers. In the Dutch focus group, it was suggested that the scanner should be the consumer’s personal property, and relevant data could be downloaded from people’s home computers.

The *information terminal* was considered to represent a suitable information scenario (42% positive), if combined with a bar-code or RFID scanner, which would enable it to provide exhaustive information about food products. Again, the problem of keeping the data up-to-date was discussed. It was mentioned that it could cause an overload of information to consumers, as they would have to choose among thousands of products.

‘Imagine there are 25,000 codes in a supermarket. If you type ‘gluten-free products’ the terminal will provide a list of 24,990 products if only 10 products contain gluten. This would not be practical’ (GR, P6 retailers).

Another potential drawback associated with the information terminal was identified as customer “queuing” if several consumers wish to use the terminal at the same time. This would be time-consuming. However, compared to the PSA or HHS the information terminal represents a relatively cheap tool which could easily be combined with other information, such as products for diabetics, organic products etc.

Differences in stakeholders’ reservations (due to different experience or traditions) about potential technical and social constraints could have led to different preferences for different ICT solutions. As compared to Germany, Netherlands and Spain, in Greece and Poland the majority of stakeholders preferred the information booklet as an appropriate information scenario. Due to, among other things, the fact that fewer consumers in the latter countries have access to personal computers, and processes in general are less automated, consumers in these countries are more familiar with “traditional” type of advertising and receipt of information from companies and official authorities than ICT solutions.

Information booklets would be easy to understand and easy to use as no technical operating knowledge is required (38% positive). In comparison to the ICT information scenarios, the costs would be low. However, the consumer “handling” of the booklets was considered to be time-consuming and it would be difficult and expensive to keep them up-to-date.

‘Well, I think that that is the old, well proven method of information, provided of course that it is efficiently kept up to date — It is important that the obsolete or outdated leaflets are to be withdrawn from circulation’ (PL, P7, service).

‘As already said, the information booklet is very inappropriate for retailers. We did not have good experiences with a booklet of additives, since hardly any consumers used it. The efforts to keep this up-to-date were clearly too large’ (DE, P9, retail)

The majority of the stakeholders were not enthusiastic about the inclusion of a *special food aisle* in the supermarket (31% positive), as it would lead to an increase to the market of “special” (allergen-free) products. Although specialty aisle segments are common practice in U.S. supermarkets (for gluten-free products), stakeholders in this study commented that non-specialised food producers would not be encouraged to produce allergen-free products, which could lead to a decrease in food safety more generally. Food allergic consumers would be forced to eat special products, resulting in higher shopping costs (as special foods are more expensive) and reduced product choice.

In addition, many stakeholders thought a special food aisle would lead to stigmatisation of the food allergic consumers. Food allergic people already experience themselves as different from other people and the inclusion of

special food aisles might potentially strengthen that feeling. Another argument against a special food aisle was that it would prevent consumers making spontaneous purchases in the course of their routine shopping activities.

In Greece, manufacturers contended that, even if consumers accepted these “special” aisles, there are few products “free of allergens” which could be included in such an aisle. However, in the Netherlands, a stakeholder had experience with fitting out 1 m of shelving in supermarkets which only contained allergen-free foods. The food allergic consumers were very satisfied with the service.

‘The turnover rate of these products is low. But consumers buy also their other groceries in this shop’ (NL, P4, retail).

Many stakeholders saw problems with the *training of an allergy expert* (51% positive). The common concern was that personnel who are relatively uninvolved in food allergy (even after being trained in the topic), would be in charge of giving personalised advice to food allergic patients. It could be very dangerous to give “subjective” advice about issues where a very small amount of an allergen can be life threatening and there is no legislation to provide guidelines about how this should be done. In fact, the stakeholders expressed the view that only specialised dieticians and trained staff should give such information, and that it may be difficult to ensure the availability of such expertise in all retail environments.

‘My one objection is that such customers would visit the supermarket instead going to the medical doctor’ (PL, P5, regulators).

‘With the training of staff in the retail sector the question of availability arises: Are there always sufficient personnel available, in order to answer the questions of consumers? What kind of knowledge do these persons have to possess? Is that not much too extensive?’ (DE, P9, retail).

The high turnover rate of personnel in the supermarkets was perceived as another problem, and several “experts” would need to be trained to provide expert advice during all supermarket opening hours. To reduce costs, it was suggested that the service could be advertised for certain limited hours in supermarket “A” and a few hours later in supermarket “B” (DE, P10, consumer association).

Most stakeholders saw the benefits of a fast and convenient product search *via an internet shop* (60% positive). An internet shop would not be associated with increased costs, as the infrastructure needed for the introduction of such a shop already exists. The main additional costs would be those for sending (small) deliveries to specific supermarkets.

In several countries, for instance in the USA, Canada, Australia and the UK, allergen-free products (in particular gluten-free) are available through internet *via* specialty

vendors. This is not common practice in the countries included in this study, although one stakeholder in the Netherlands initiated an internet shop specifically for food allergic consumers in 2004. Consumers appreciated the expertise available and asked a lot of questions concerning their diet. However, at the time of writing, ordering food through the internet is not common in the Netherlands, and many people are afraid of fraud (this was also mentioned in Greece). Age and social limitations may also be relevant, in cases where internet is not easily accessible.

The *standardised label* was the most preferred method of information delivery in all focus group meetings (82% positive). In part, this was for legal reasons (no other information scenario can fulfil legal requirements for information delivery). For all participants in the focus groups, labels are of key importance in information provision for food allergic consumers.

'I believe that the most important thing is labelling, because this is where the scanner or a personal shopping assistant will receive information' (GR, P1, consumers).

The stakeholders suggested developing and implementing *internationally recognised* rules for labelling. Stakeholders from the food industry explained some of the difficulties in adding symbols to the existing food labels. The limited space on labels does not allow for inclusion of varied symbols and additional colours. The authorities made clear that there is no possibility for symbols to substitute for written ingredient lists. The emerging need for common European/ international symbols for food allergens was raised.

Several stakeholders mentioned that bar-code labelling could be combined with information provided by the internet. Consumers could then look up bar-codes and search for more information, for example, about the origin of foods and ingredients. Explanations of difficult terminology, (for example, information about E-numbers, additives etc.) could be included on such a website.

'A fully written out label is a point of discussion, because the label is too small to write everything down. Symbols are very nice if they are supplied with sufficient information on what they mean. And according to us the best channel to communicate this would be through the internet' (NL, P8, regulator).

'We think that with standardised symbols of common allergens on the package – for instance a short list of 4–5 allergens (eggs, dried fruits, wheat, milk...) – we could cover 80% of allergies' (ES, P3, retail).

The costs for implementing new labelling strategies were thought to be relatively high. The development of new legislation would be expensive for regulatory agencies. Similarly, the costs for industry would be high if labels and production processes need to be altered. Industry

stakeholders doubted whether industry would be willing to pay for these changes, unless they were enforced by legislation.

Concluding remarks and policy implications

Whilst all stakeholders agreed on the potential advantages of ICT delivery approaches, they seemed reluctant to implement them due to potential for increased costs in a highly competitive market. Traditional approaches to information delivery were preferred, although novel ICT approaches were not ruled out. There was consensus between different stakeholders in different countries regarding the need to harmonise labelling practices and internationalise symbolic labelling, but less agreement regarding how new ICT approaches could be utilised to deliver personalised information to individual consumers regarding information about allergens. In part, this was due to concerns about increased costs, but also reflected different technical and social limitations as well as cultural expectations regarding information delivery. There was also the concern of database upkeep and the responsibility for the information provided. It seems likely that information delivery approaches need to be adapted to local needs and preferences. However, improvements in ICT, as well as more widespread consumer experience of novel ICT approaches to delivering information, may improve acceptance by both consumers and stakeholders in the future, particularly if implementation costs are kept to a minimum. Restructuring the retail environment (the "special aisle" for food allergic consumers) or training additional "expert" staff were not popular options among stakeholders, and as a consequence are unlikely to be introduced in the near future.

Different actors and stakeholders involved in the food chain were aware of the need to inform food allergic consumers about potentially problematic foods and ingredients in a more user-friendly way. Although most stakeholders were positive about standardised labelling, it is likely it will only be introduced when enforced by international (EU) legislation.

As part of this activity, issues associated with font size, contrast, shiny packaging, incomplete ingredient lists, location of allergen information, and harmonisation of terminology and symbols should be addressed (Cornelisse *et al.*, 2007). For instance, the USA have a new labelling law which mandates the use of a "Contains..." (allergenic ingredient) statement below the ingredient list on packages. The stakeholders representing the authorities made clear that there is no possibility for symbols to substitute for written ingredient lists, which is also confirmed by food allergic consumers (Cornelisse *et al.*, 2007).

New ICT applications like RFID or bar-coding on foods sold loose could be used to provide information which is more complete and easier to understand. To guarantee the accuracy of all novel information strategies, these systems could be linked to improved traceability systems now in development. Such traceability systems refer to standards, the

developments of protocols of information transmission, software and hardware, linking with customers and international trade documentation systems and other aspects.

One limitation of the study was that the number of participants was limited to 55 individuals. It would be useful to conduct further research using a larger group of stakeholders in order to capture a broader spectrum of opinion from diverse stakeholder groups, and facilitate comparison of opinion between different types of stakeholders.

Further research into the implementation of novel information delivery strategies is needed to identify the potential consequences of their introduction for the food industry, including retailers, as well as for regulatory authorities and consumers themselves. For example, consumers – especially those with health problems – value nutritional labels and are willing to pay more for food products that have a complete and understandable label (Gracia, Loureiro, & Nayga, 2007; Loureiro, Gracia, & Nayga, 2006). Whether this also applies to allergen-free products is a topic worthy of further investigation.

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