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Managing uncertainty about food risks - consumer use of food labelling

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General consumer knowledge of and engagement with the production of food has declined resulting in increasing consumer uncertainty about, and sensitivity to, food risks. Emphasis is therefore placed on providing information for consumers to reduce information asymmetry

regarding food risks, particularly through food labelling. This study examines the role of food labelling in influencing consumer perceptions of food risks. In-depth, one-hour interviews were conducted with 24 Australian consumers. Participants were recruited based on an *a priori* defined food safety risk scale, and to achieve a diversity of demographic characteristics. The methodological approach used, adaptive theory, was chosen to enable a constant interweaving of theoretical understandings and empirical data throughout the study. Participants discussed perceiving both traditional (food spoilage/microbial contamination) and modern (social issues, pesticide and 'chemical' contamination) risks as present in the food system. Food labelling was a symbol of the food system having managed traditional risks, and a tool for consumers to personally manage perceived modern risks. However, labelling also raised awareness of modern risks not previously considered. The consumer framing of risk presented demonstrates the need for more meaningful consumer engagement in policy decision making to ensure risk communication and management meet public expectations. This research innovatively identifies food labelling as both a symbol of, and a tool for, the management of perceived risks for consumers. Therefore it is imperative that food system actors ensure the authenticity and trustworthiness of all aspects of food labelling, not only those related to food safety.

Keywords

consumer; food; food labeling; risk; risk perception

Introduction

Food risks are unique in that consumers face them every day (Fischer & De Vries, 2008). However, research exploring food risk often focusses on consumer perceptions of expertly defined risks, stating that consumers overestimate the risk posed by some hazards and underestimate others (Ueland et al., 2012; Verbeke, 2005; Williams, Stirling, & Keynes, 2004). Modern food systems have been described as highly institutionalised, 'unpredictable, fragmented, and contradictory' (Kjaernes, 2012, p. 153; Poppe & Kjaernes, 2003), and, as such, general consumer knowledge of and engagement with the production of food has declined (Meyer, Coveney, Henderson, Ward, & Taylor, 2012). This contributes not only to an increasing divergence in the concerns of producers and consumers regarding what constitutes food risk (Brom, 2000), but also evermore consumer uncertainty and anxiety regarding these risks (Meyer et al., 2012). As such, the study of food risk as it is understood and framed by different agents within the food system is increasingly relevant. Emphasis is placed on the importance of providing information for consumers to make 'informed food choices', presumably, in part, mitigating food risks. In modern food systems, food labelling plays a primary role in facilitating information exchange between consumers and the food system. Therefore developing an understanding of how food labelling influences consumer food risk perceptions is essential.

This paper utilises Beck's (1992; 1994) account of reflexive modernisation to conceptualise risk, founded on the premise that 'risks count as urgent, threatening and real or as negligible and unreal only as a result of particular cultural perceptions and evaluations' (Beck, 2009, p. 13). Beck (1992, p. 20) describes reflexive modernisation as a process by which late industrial societies are moving towards 'risk society'; that is to say, a process representing a transition between a society preoccupied with the distribution of wealth created through industrialisation, to a 'risk-distributing society'. In the latter, risk society is where science and industry work to prevent and manage hazards through rationalisation, and citizens are reflexively aware of new forms of risk created through the successes of industrialisation (Beck, 2009). Risk society is therefore characterised by an awareness that many uncertainties faced today are not resolved by, but conversely, originate from human knowledge (Giddens, 1994). As such, reflexive modernisation involves the projection of

blame for risks outwards (to science and industry for creating hazards), but there is a concomitant internalisation of self-responsibility for seeking knowledge regarding, and therefore managing, risk in everyday life (Tulloch & Lupton, 2003). The problem of consumer food choice exemplifies the attribution of blame to external forces for risk creation, and the internalisation of responsibility for managing risks.

Food risks are commonly framed as threats to safety or quality (Verbeke, 2005). However, another distinction that usefully flows from the thesis of Beck's risk society is that of 'traditional' and 'modern' risks (Beck, 1992; Buchler, Smith, & Lawrence, 2010). This distinction differentiates risks based on their cause; delineating hazards by their origin (either naturally occurring or brought about by industrialisation) is a fundamental concept of reflexive modernisation (Giddens, 1994). 'Traditional' risks are those that have always been present in nature, not created through human control and therefore with an element of fate and mysticism. Buchler et al. (2010, p. 355) define traditional food risks as food microbial contamination and spoilage. Conversely, risks produced through human technologies, interventions and due to human decision making here are termed 'modern' risks (Beck, 1992). We use the term 'modern' not with the intention of demarcating a particular era of time, but rather to affirm Beck's thesis that these are risks of modernisation, the global products of industrialisation and human intervention. In contrast to 'traditional' risks, these have much larger scope of impact and are much more difficult to see, contain and manage (Beck 1992). For Buchler et al. (2010) modern risks are those brought about by biotechnology in food production, classifying food additives, chemicals, pesticides and their associated regulation as areas of modern risk for investigation in their study. Given the divergent origins of modern and traditional risks, it is reasonable to consider that consumers may manage them differently in their everyday interaction with food.

The conceptual purpose of risk management for individuals is twofold: to help feel a sense of control related to perceived threats, and to make sense of harm should it occur, thereby managing uncertainty and anxiety regarding threats and dangers (Lupton 2013). The aim is to reduce feelings of uncertainty and vulnerability, whether realistically it is possible to have any control over risk or not (Lupton, 2013). However, in risk society where modern risks are

invisible, global and incalculable (Beck, 1992), ‘risk meanings and strategies are attempts to tame uncertainty, but often have the paradoxical effect of increasing anxiety about risk through the intensity of their focus and concern’ (Lupton 2013, p. 19). Knowledge therefore becomes an important and powerful tool in both managing and creating uncertainty regarding risk for all members of risk societies (Fox, 1999). In the case of food, labelling is the central communication pathway between consumers and the food system; it is the conduit of understanding and information for individual food products. Given its role in knowledge transfer in food systems—which is reliant on the probity of manufacturers who may or may not fully declare all product aspects consumers see as relevant—food labelling inevitably contributes to consumer perceptions of food as a risk.

Previous research links consumer label reading behaviour with management of perceived food risks. Dörnyei and Gyulavári (2016) state the primary motivation for label information search is avoiding health-related risk, naming ‘fear’ as a ‘general personal factor’ motivating label information search. This is supported by Williams et al. (2004) and Lupton (2005) who found Australian consumers use labelling to avoid ingredients they believe to be unhealthy or dangerous. Similarly, Kraus (2015) found that an important motivator for the purchasing of functional foods were ideas about health risks. Pinto et al. (2015) also found perceived risk of food-borne disease was correlated with label reading. Abstracting this idea beyond health concerns, Hall and Osses (2013) comment that consumers use of different labelling components generally reflects their personal concerns regarding food.

However, previous research has utilised survey methods, only briefly touching on label information search and food risk as part of wider discussions of food label use. Thus, the role of labelling in influencing uncertainty regarding perceived food risks for consumers remains to be thoroughly explored. Unlike previous research, this study sought to examine participants’ framing of food risk generally, and not how these risk perceptions influence specific food choices. This study provides novel insights through focussed examination of consumers’ interaction with food labelling and how it influences uncertainty regarding perceived food risks. The study objectives were:

1. [to describe the risks consumers perceive to be present in the food system, and](#)

2. to explain how consumers used labelling information to facilitate the management of uncertainty relating to these risks.

Methods

This study used the methodological approach of adaptive theory (Layder, 1998). Adaptive theory is an adaption of Glaser and Strauss' Grounded Theory (Gordon, Lockwood, Vanclay, Hanson, & Schirmer, 2012; Layder, 1998), which emphasises the generation of new theory that is not isolated from useful existing bodies of knowledge. Briefly, Central to the processes of adaptive theory is the use of ~~utilises~~ extant theory throughout the entire research process, enabling emerging theory to be connected with an the ongoing established body of theoretical concepts and firmly applicable and locatable in current knowledge bases (Bessant & Francis, 2005; Layder, 1998). Importantly, the body of concepts and theoretical ideas taken into the research is 'not inviolable but entirely provisional, to be modified, abandoned, confirmed or retained' as needed by the empirical data (Layder, 1998, p. 58). Adaptive theory therefore requires that research design and analysis involve iterative and harmonised analysis of extant theory and empirical data (Gordon et al., 2012). Layder (1998) is clear that theory should be used flexibly, not concretely, to "help to both organize the data and stimulate the process of theoretical thinking" (p. 54), rather than provide a pre-ordered set of theoretical ideas to be empirically tested. Thus, the constant interweaving of theoretical understandings and empirical data was a feature of this study.

Theoretical sampling (Layder, 1998) was used to recruit participants between May and July 2014. Sampling was based on an *a priori* defined food safety risk scale (low, moderate and high risk) as population representative studies show consumers with diet-related health conditions are more likely to engage with food labelling (FSANZ, 2008). Sampling thus incorporated elements of extreme sampling where participants who are likely to have the most knowledge and experience relating to a topic are actively sought. The aim of this sampling approach is not to gather a population representative sample, but to ensure all potential perceptions of risk and ways of managing uncertainty regarding those risks are captured within the sample (Nicholls, 2009). This approach is outlined in Layder's (1998)

theoretical sampling, and is a common approach in qualitative research. Low risk consumers were those who did not identify themselves as having special dietary requirements. Moderate risk consumers were those with food intolerances or non-acutely life threatening dietary conditions such as coeliac disease or Type 2 diabetes. High risk consumers were those with (or who shopped for others with) life threatening dietary considerations such as food allergy. We also sought to recruit consumers from a range of food markets, and with varying demographic characteristics (age, gender, place of birth) as these factors have been shown to influence perceptions of risk (Buchler et al., 2010) and attention to food labelling (FSANZ, 2008). A range of recruitment approaches were used to target the population groups outlined above. High risk participants were recruited through advertising with Allergy and Anaphylaxis South Australia, while moderate and low risk participants were recruited through posters in supermarkets, gyms and malls. Recruitment ceased when all theoretical sampling dimensions had been adequately represented, and the data were found to be saturated (no new ideas or themes were being raised by additional participants) (Mason, 2010). Participants were reimbursed \$30 for expenses associated with taking part in the research. Ethics approval was granted by the Flinders University Social and Behavioural Research Ethics Committee (SBREC6429).

In-depth, face-to-face interviewing was chosen as the primary method of data collection. Interviews were typically of one hour duration and were loosely structured around the main themes of shopping considerations (including management of concerns relating to food), use of labelling, comparisons of labelled and unlabelled products and trust in the food system. This paper chiefly draws on participants' considerations relating to food and their comparison of unlabelled and labelled package prompts. Participants were asked to describe their shopping practices in general and food risk/concerns were spoken about spontaneously, with probing used to expand discussion. In this way food risk was not narrowed to an exploration of food safety, but reflected the perceptions and concerns of this group of participants, enhancing authenticity (Fade, 2003). When participants did not spontaneously discuss concerns, they were asked if there was anything they worried about regarding food. Importantly, the interviews did not focus on participants' specific food choices. While discussions of food choice are unavoidable in a study of this nature, these were used to elucidate the areas of risk perception presented by participants, and not how

these different areas were traded-off in food choice decision making. Images and real examples of packaging were used as prompts for discussion (Eden, Bear, & Walker, 2008) ([Table 1](#)) and more detail about prompts can be found in Tonkin *et al.* (*forthcoming*). Given some foods are perceived by consumers to hold more inherent risk (Poppe & Kjaernes, 2003) we also included a range of foods from low (packaged tea) through to high risk (fresh meat) (Kjærnes, 2006). Finally, a pair of real chocolate packages and a pair of real tea packages, both including one labelled and one packaged but minimally/unlabelled, were included as a comparison (Figure 1). All packages in these comparisons were sealed and the chocolate products were visually identical. Participants were asked ‘are there any meaningful differences between these two products?’ when presented with the comparisons.

Analysis followed that outlined by adaptive theory (Layder, 1998), [and was consistent with other studies using this approach \(Bessant & Francis, 2005; Emlet, Tozay, & Raveis, 2011; Gordon et al., 2012; Gross, 2007; Scott & Carr, 2003\)](#). Each audio-recorded interview was transcribed whole and coded using a set of codes elicited from the data itself (provisional coding). Analysis was managed using NVivo 10 (QSR International, Doncaster). Theoretical memo-writing (Layder, 1998) was used to summarise interviews and develop the emerging themes, connecting them with theory. Individual transcripts were read, coded and summarised multiple times by the primary author. The concept of ‘risk’ was used to group transcript sections, which were then separated into the categories of ‘health risks’ and ‘social, moral, ethical risks’ based on evident differences in participant framing. Social, moral and ethical risks were defined as those unrelated to the participant’s own health, encompassing issues of social justice and harm to the environment, animals or people working within, or otherwise impacted by, the food chain. Consistent with adaptive theory, existing literature was then reviewed to develop a framework through which participants’ risk framings could be linked with how labelling was used to manage them. It was found that ‘social, moral, ethical risks’ and discussions of health risks including a human action component (use of pesticides, additives, addition of macronutrients for taste alone, carcinogenic food processes) were theoretically consistent with ‘modern’ risk as outlined by Beck (1992). Similarly, participants’ description of health risks inherent in food, like food poisoning related to food spoilage, were consistent with ‘traditional’ risks (Buchler et al.,

2010) (Table [2](#)). This new grouping of participants' risk framings assisted with making sense of the seemingly contradictory roles played by labelling in helping participants to manage risk and uncertainty, thus expanding the depth and explanatory power of the analysis. The developing analysis was presented to the wider research group at fortnightly meetings in visual, verbal and written forms. This enabled critique of process and outcome, ensuring robustness of data and analysis, and analyst triangulation (Fade, 2003).

Results

The demographic characteristics of the 24 interview participants are given in Table [3](#). The ways in which participants discussed food risk are presented below, followed by a description of participants' perceptions of traditional and modern risks. These descriptions provide the foundation for the subsequent findings, those exploring how food labelling facilitates the management of—but also creates and fosters—uncertainty regarding risks. The findings are integrated and summarised in Table [4](#).

Consumer framings of food risk

Participants typically initiated discussions of risk using the terms 'quality' and 'safety'. When asked to define quality attributes participants usually described them in terms of risk;

‘So I tend to go for like the cold pressed and just the higher quality ones [oils]. I mean you pay a bit more; it's just a bit better because of the carcinogenic risks and stuff’ (Lewis).

While risks associated with both packaged and fresh foods were discussed, participants predominantly focussed on risks uncontrollable through home based practices. Participants were very risk-aware, ‘I like checking food because I want to make sure what I eat is healthy and safe’ (Leo). Those with young children were usually the most risk averse, and in general, parents perceived risks to be more relevant to their children than themselves, as shown by this quote from Lucy ‘Yeah so, I guess having a daughter like, we always did take care of what we ate but having a child I guess makes it even more important’. Notably, not all consumers expressed concern regarding all the risks discussed in this paper. It was often the case that participants who perceived a specific risk intensely showed little consideration of

other risks, as demonstrated by this mother of a child with a food allergy, 'If it's not related to allergies I try not to over think these things. I don't tend to necessarily think laterally about that sort of stuff [fair trade, organic processing]' (Isla). Overall, thoughts and behaviours relating to risk were discussed by participants as a familiar part of their everyday lives.

Traditional Risk. Traditional risks mentioned by participants were those related to allergy or ill-health caused by food spoilage or contamination, and participants clearly defined the consequences as acute and visible health issues. These perceived immediate health risks included microbial contamination due to food spoilage or hygiene issues in growing, processing and preparation. Acute allergic reaction in response to food contamination was another risk identified by participants. Traditional risks were raised infrequently, and overall consumers displayed confident expectations that although these were risks inherent in eating food, the food system was managing them, 'I think that just normal first world things. I expect the food to be hygienically stored or hygienically sealed' (Thomas). Both primary (strict regulation of farming and processing practices) and secondary system factors (monitoring and testing of products) were identified by participants as evidence of this. Different types of foods were considered more risky, 'But it's tea so I'm not overly worried by it' (Oliver) and over half of the participants who discussed this type of risk specifically contrasted Australian and imported foods. Different purchasing locations also influenced the level of perceived traditional risk,

'...for instance what's in the hot food section, the roasted chickens... I would buy that chicken in, you know, a big supermarket because they cannot risk losing their reputations. But for those small deli and grocery store [*sic*] I wouldn't buy those products' (Leo).

Participants with more personal experience of food production processes were less concerned about traditional risks,

'Well I've always worked in manufacturing environments so I guess I kind of, it doesn't really [worry her] because I know that things have to be processed the way they do to meet cost requirements for the business that's doing it' (Lucy).

Thus traditional risks were those which had clear and visible outcomes, were naturally occurring in food and participants generally assumed they were mitigated by food system actors.

Modern Risk. The broad categories of modern risks described by participants were health issues caused by contamination with harmful products during production (system-generated risks), and social, ethical or moral issues brought about by food production.

System-generated health risks. Perceived system-generated health risks were the most frequently raised type of risk, with every participant describing one or more of the risks categorised here. These were presented by participants as ‘carcinogenic’ food processes, foods contaminated with ‘chemicals’, unsafe additives and preservatives, farming practices that led to contamination (for example hormonal) and a lesser but still discussed form was poor nutritional profile of food products leading to chronic disease, ‘There’s plenty that I worry about in regards to food...definitely you hear a lot about the carcinogenic stuff and things like MSG. The additives are probably a big one’ (Lewis). Genetic modification issues were discussed but were not a primary concern for these participants. These perceived risks were most often opaquely described and seemingly difficult to define for consumers, ‘you just know Cheerios are bad for you’ (Grace), but had long-term implications, ‘with the soy milk again it’s how is that affecting...how will that affect, not maybe tomorrow but in 10 or 20 years’ time?’ (Lewis). Infrequently the consequences of these risks were identified directly, and these were outcomes like cancer and the ‘obesity epidemic’; ‘I mean what preservative? There are links to cancers and things like that with some of them and I’d really like to know which ones they are’ (Lucy). Participants who had children with a food allergy frequently articulated concerns about additives and preservatives, which they identified as being brought about through frequent label reading. Two participants perceived system-generated health risks so intensely that they discussed food in terms of a dichotomy, food and not-food (for example processed cereals), ‘So I think I’ll be teaching them [her children] about food labelling when the time comes, how to know what’s food and what’s not’ (Fran). As such, system-generated health risks were the most frequently considered type of risk for participants, and were those discussed as having less visible, but important long-term consequences.

In contrast to traditional health risks which were seen as being naturally present in food and mitigated by food chain actors, system-generated health risks were predominantly perceived as being created and perpetuated by food chain actors,

‘The great agricultural experiment we are... there’s all these chemicals out there that we wash our food in repeatedly that we’ve got no idea about the long-term effects of... But that’s all government regulated which is kind of wrong...’ (Henry).

The majority of these risks were identified as things consumers needed to address themselves, there was no expectation that others would be helping to manage these risks, ‘Maybe like health-wise I wouldn’t really expect it [Australian food] to be too healthy, and that would be something that I would look into myself’ (Chloe). The only exceptions were two participants who had a farming background who felt the system was well controlled with regard to perceived system-generated health risks, but only local Australian food,

‘And because Australia does have such a good... What’s the word...? You know they keep an eye on what’s going into products and all of that... Sometimes too much maybe but I like that idea and you read often foods that have come from other countries that the animals have been pumped with all sorts of things’ (Liz).

Like traditional risks, perceived system-generated risks were particularly associated with imported foods, either through personal experience or through news media, ‘I think it’s important to support local products because they are *safer* and they are healthier’ (Leo, his emphasis). A quarter of participants used strong language around the safety of imported foods, particularly older participants, those living in rural areas and those with farming connections. Therefore, participants expressed needing to take personal control, or making active food choices to avoid these risks which they saw as being *created and perpetuated* by the food system.

Social risks. The second type of modern risk identified by participants was a social framing of food risk; risks to society or their ethical and moral integrity brought about by food production practices. These risks were typically secondary to health concerns, however

were central concerns for a small number of participants and raised by the majority as peripheral worries. Participants' discussion of these risks centred on the implications of transporting food long distances and the negative environmental implications of conventional farming,

‘...obviously if you produce things out of season or transport them long distances there’s a lot of energy used and a lot of other things. So I’m really trying to avoid those factors’ (Isaac).

Other social risks participants expressed were human costs in food production, discussed as fair market practices and trade, ‘...tea is one of those processes that when you’ve got big companies buying a lot, are other people at the other end actually being paid what they need to be paid and being looked after the way they should?’ (Lucy). A similar social risk articulated by almost all participants was that of losing local production and unfairness towards local food producers, ‘...I don’t think we need to have other oranges because our people that are growing this stuff have to live. And if we’re buying Californian oranges, well the Riverland people, what are they living on?’ (Anne). The framing of this situation as a risk was enhanced by the perception that Australian food is safer, linking this risk of loss of local production to health risks in general. Therefore, again participants discussed social, ethical and moral risks as being outcomes of a globalised food system, requiring personal consideration and management.

Labelling and managing perceived food risks

The preceding section described participants' framing of food risks. The following sections discuss how food labelling facilitates the management of uncertainty about these risks, and how this differs based on whether the perceived risk is traditional or modern. The participants in this study appeared to demonstrate two separate pathways by which uncertainty regarding perceived risks was managed using labelling: food labelling acting as a *symbol* that *someone else* has managed risk for them (left pathway in Table 4), and an active interaction whereby food labelling is used as a *tool* to *personally* manage perceived risks (right pathway in Table 4). [Here the term ‘symbol’ is used to represent the idea of a summary-construct; a representation or sign of a greater concept. It is not intended to](#)

[mean an identifying mark, such as an emblem or logo.](#) It is important to note that both pathways may be utilised by a single participant—albeit for the management of different risks—even within the same product. These data arose from the section of the interview where participants compared labelled and un/minimally-labelled chocolates and tea (Figure 1).

Delegating control of risk management to others – labelling as a symbol. The symbolic role of labelling describes the role labelling played for participants before the reading or processing of labelling content. For all participants the simple fact that certain label elements were present *at all* influenced risk perception and uncertainty management, regardless of what was written or pictured,

‘When I look at the use-by date on the top, I believe that date, and that that’s a conservative date that I can safely eat that food because a government has mandated that certain safeguards have to be in place’ (Thomas).

Participants’ reactions to unlabelled products appeared to demonstrate that labelling was a symbol of hygienic processing systems; safe food in terms of traditional risk. When comparing labelled and un/minimally-labelled products, consumers articulated concerns regarding traditional risks, ‘...you might sort of suggest that a product that appears to have been more processed or packaged is safer just because it’s, it’s, it’s not been done in someone’s backyard’ (Oliver). For two participants purchasing an unlabelled chocolate was such a risky prospect that they could not understand the question,

‘Chloe: If, if that say came in sort of a similar packaging to the [labelled chocolates] then...I don’t know actually.

Interviewer: So you said “if it was packaged the same”, so is that like...?

Chloe: Yeah just with like the labelling and yeah the table [nutrition information] and everything’.

A lack of labelling did not preclude purchase for the majority of participants, but all articulated that unlabelled products required a direct encounter with the producer/seller, ‘I would still be cautious, it’s not like I’m gonna jump at stuff that has just been chucked in a bag’ (Ruby). For a minority however, even a face-to-face encounter could not replace the

reassurance provided by labelling regarding traditional risks, as demonstrated by Margaret, a low risk consumer, when asked if she would seek this information from a vendor,

‘Margaret: Well I might, I might. But I doubt if I’d buy it.

Interviewer: You probably still wouldn’t buy it anyway?

Margaret: No, unless it was something that really took my fancy. But I mean mostly... Unless it was... No it would be most unlikely’.

Therefore for these participants food labelling—regardless of its content—appeared to act as a symbol of systems of production and manufacture that result in safe food in terms of traditional risk.

Personal management of risk – labelling as a tool. The second pathway to managing uncertainty apparently demonstrated by participants was an active use of food labelling to personally make food choices to avoid perceived risks (right pathway in Table 4). Unlike the symbolic pathway, this involved reading and interpreting labelling, and the messages communicated by labelling were important,

‘So you know the nuclear crisis in Japan? After that happened I took extra care about seafood that I’m buying. I always check the country of origin because the nuclear waste leaked into the ocean... So I check the country of origin and relate them to the news’ (Leo).

This pathway appeared to be demonstrated when participants discussed modern perceived risks, and is consistent with their framing of modern risks as being created by food system actors, and requiring personal management, ‘So if the companies do still make products with for example the 133 number for colours at least people know that it’s there; “okay, am I going to risk side-effects or am I just going to” ...’ (Ruth). This pathway was frequently discussed relating to perceived modern risks associated with imported foods,

‘Again, the food coming into Australia, they don’t need to meet those standards [regarding pesticide use] so we don’t know what we’re putting in our bodies. And it is a concern especially when you start to think about it. So...I will purchase vegetables that say “made in Australia” or “grown in Australia”, not if it says from Taiwan or something...China...’ (Paula).

Participants expressed using a variety of label elements to reassure about different risks; however branding information was often described as a shortcut for this process, 'I'd look for brands that I trust, and that's probably more just a way of fast tracking the, checking the ethical or otherwise considerations' (Oliver).

Participants describing a heightened anxiety about perceived risks were clear that label reading was an important strategy enabling them to feel safe in using the conventional food system,

'Interviewer: So it sounds almost like - and correct me if it's wrong - overall you feel like things are a little bit out of control in terms of the wider food system and what they're putting into food and all of that, but labelling helps you feel like you've got a little bit of control over that and then you can sort of monitor what goes in and out of your house?'

Yes. Yes, you know I'm trying to do it well but I'm not 100%... So I do make decisions based on that' (Fran).

As such, participants described using labelling as a tool for their own personal management of perceived system-generated risks.

Prerequisites for using labelling to manage uncertainty. Labelling could only be used to manage uncertainty if the information it presented was trusted. For all but a minority of participants trust in labelling needed to be supported by other forms of social control, 'I couldn't do it [ensure food safety] all by myself; I have to rely on the labelling. And I do trust food labelling because if they are not approved they wouldn't be able to put it on the package' (Leo). Further social controls participants discussed included reputation, regulation, monitoring and prosecution for misconduct,

'I'm cynical, but I have to trust. But... And I'm distressed, which is why I was talking about policing, when that trust is failed. Which it is. Case in point being the soy things that I bought the other day that were in a packet; looked like that, only it said "soy something"; [mimics examining packet] no nutritional panel, no ingredients, no country of origin... somebody should've gone "Oi, you can't sell that"' (Henry).

Four participants, while still personally managing uncertainty through active choices, felt they could not use labelling as a tool to achieve security about the risks they perceived to be present in the food system. While they described trying to utilise labelling in this way, they explained that the only method they had found to feel safe was procuring food through direct agricultural links,

‘So the labelling fails dramatically. Yeah so the labelling doesn’t tell you much at all. That’s where you’ve got to go back to a relationship with the person that produces it and in the main try to keep away... Well try to avoid where possible the processed food or food that’s processed from processes that you’ve got no control or no trust in’ (Isaac).

All four of these participants also described managing risk by growing their own produce, ‘so you know there’s no pesticides on it, there’s no chemicals; it’s whatever you’ve put on it’ (Paula). These participants had a number of characteristics in common; all had education to a Master’s degree level or higher, had personal experience with food production in some form, and were highly reflexive about perceived modern risks,

‘It’s linked to food safety and sustainability...food safety; if you’re buying from the person that grows it, like through farmers’ markets, then you can feel a lot...generally feel a bit more confident about what they’ve done... And I think in terms of [pesticide] tests of fruits and vegetables, yes there’s...there can be high tests in terms of some growers that have struggled to meet the proper standards. Now if you [buy] from somebody you know and you’ve seen their practices then you can feel a lot more confident about, about those things’ (Isaac).

Interestingly, one participant contemplated whether this achieved actual or just perceived control, ‘So basically I like to have that direct link...So you know, I don’t know whether I’m eating healthy or not but it would be nice, it’s nice to try and make a choice’ (Bruce). Two further participants who also expressed extreme worry regarding perceived modern risks discussed attempting to utilise direct agricultural links but finding this too impractical and expensive, used other strategies to manage uncertainty, ‘I try to make a lot of stuff from scratch so that I know what’s gone in it. And then really, I don’t stress much’ (Abbey).

Consumer trust in labelling was therefore essential for its role as a symbol or tool for the management of uncertainty and risk.

Labelling fostering uncertainty about perceived risks

While labelling facilitated the management of uncertainty for participants regarding some risks, it concurrently functioned to foster and create uncertainty about others. The symbolic role of labelling in managing but also fostering perceived risk, and how that intersected with the type of risk, is exemplified in the following quote. Abbey contrasts traditional and modern health risk considerations in response to unlabelled chocolates,

‘Definitely [there is a difference], automatically you think this one’s [unlabelled] healthier because you think it’s come from a market or something; bit less processed, less big manufacturers, maybe better quality control in a sense. Yes the... I would naturally, psychologically, think it’s a healthier choice. Even if it is a chocolate. But then that’s a false sense of security because the food safety and that... “well we don’t know; does your cat run along your counter?” like where is the quality... You know...?’

In this way labelling acted as a symbol of modern risks participants had previously considered.

Additionally, over half of the participants described incidents where labelling had caused self-confrontation about modern risks they had not previously considered, resulting in uncertainty which extended beyond simply that product,

‘And I remember years ago being stunned that anyone thought to assure me that... What was it...a snake or a jube would be 99% fat free... I never stopped to think that a lolly might contain fat. Perhaps it would? It actually brought a concern to my mind that had never been there’ (Thomas).

Reading and processing labelling appeared to trigger reflexivity regarding risk in the food system. Participants described discovering ingredients and food processing practices they perceived to be risky; ingredients, claims, warnings labels that they perceived to indicate that labelled food is artificial,

‘Having all these food allergies, reading labels, you read all the other crap that’s in there. So even if it is dairy and egg free I often put it back because I go “Well what’s that number? What’s that weird name?” and I won’t have them eat that’ (Grace).

Further, particular labelling elements were interpreted as confirmation that dangerous substances are present in the food supply, ‘And it shouldn’t have to say “contains phenylalanine¹” in it, because that’s a warning to people. So it should... If it’s a warning to people you’ve got to know that you need to be warned’ (Henry). In this way labelling appeared to play a role in creating uncertainty about previously unconsidered modern risks for participants, triggering a switch from the low (left pathway in Table 4), to the higher reflexivity pathway for managing uncertainty regarding risks (right pathway). As such, labelling played a role in creating concern about previously unconsidered modern risk for these participants.

Discussion

The key findings emerging from this study are: food risks described by consumers can be characterised as both traditional and modern risks; the type of risk influences how labelling is used to manage uncertainty and perceived vulnerability (either as a *symbol* of traditionally safe systems, or a *tool* for the personal management of modern risks); and finally, that labelling can also act as both a symbol of, and trigger for concern regarding, potential modern risk. The following discussion sequentially expands upon and discusses the implications of each key finding.

The framing of food risk by participants in this study broadly supports research conducted in the last decade in Australia (Buchler et al., 2010; Lupton, 2005; Williams et al., 2004) and globally (Behrens et al., 2010; Hall & Osses, 2013; Tucker, Whaley, & Sharp, 2006). The emphasis placed on system-generated health risks by these participants is consistent with a population representative survey by Williams et al. (2004) showing double the concern in

¹ In Australia foods containing phenylalanine (aspartame) must include this warning label; however it is only relevant to people with the genetic disorder phenylketonuria.

the Australian public about pesticides, additives and preservatives (modern risks) compared with food hygiene, and bacteria (traditional risks). This is supported by research suggesting that lay individuals perceive 'unnatural' hazards where blame can be attributed to an individual to be more severe than those occurring naturally (Hansen, Holm, Frewer, Robinson, & Sandoe, 2003). Consumers not only care about traditional risks like microbial contamination and food spoilage, but perceive risks related to long-term health, as well as the health and wellbeing of other people, the environment, and animals (Miles & Frewer, 2001). This is consistent with a sociological framing of food consumption (Knox, 2000).

Risks by definition involve threats to outcomes we value (Fischhoff & Kadavy, 2011), therefore this framing of food risk provides insight into the outcomes consumers value in food production. They bear little resemblance to those underpinning the rational assessment of risk that remains central to the work of risk-assessors, government policy makers and regulators working in the sector. Decision making in these areas privileges scientific knowledge, balancing the often competing valued outcomes of productivity maximisation, industry growth and public health (Hansen et al., 2003). As such, we support the conclusions drawn by Hall and Osses (2013), who emphasise the importance of acknowledging the divergent framings of risk, and therefore the underlying values driving risk perceptions, in food risk communication and management. This research suggests that food system actors will meet consumer expectations regarding food risk management only when privileged outcomes extend beyond simply public health and safety to reflect the additional health, social and environmental values of the public also.

Food labelling acting as a symbol of both the food system's management of traditional food risk, but also the potential for modern risks is consistent with Beck's theory of reflexive modernisation (1992; 1994, 2009). Modern food systems characteristically employ rationality and technology to exercise control over preventable food-borne illness. In this study participants articulated a confident expectation that the food system minimises traditional risks as far as possible, indicating a situation of trust (Giddens, 1990). Therefore labelling was symbolic of the successes of industrialisation in managing traditional risks, enabling reduced uncertainty about these risks for participants. As such labelling can be

thought of as providing informal risk communication between the food system and consumers, currently providing reassurance regarding traditional risks.

However, data suggest that labelling was concurrently a symbol for previously considered, and a trigger for reflexivity regarding unconsidered, modern risks. Participants articulated a personal responsibility for and used labelling as a tool to manage modern risk. Participants described a host of health, social and environmental risks being introduced by human decision making during food production; risks created and perpetuated by an industrialised, globalised, disembedded food system. In 'risk society' the public are less referential to science than was previously the case, as many risks they perceive in the world are created through science, 'scientific knowledge about risk is incomplete and often contradictory, failing to solve the problems it has created' (Lupton, 2013, p. 87). Food labelling was shown here to play an important role as a tool for facilitating participants' active management of perceived system-generated risks. Therefore our findings support and extend those of previous research (Dörnyei & Gyulavári, 2016; Kraus, 2015; Pinto et al., 2015; Williams et al., 2004), positioning labelling as a critical uncertainty management tool for consumers.

Given the obvious requirement for consumer trust in labelling for it to be used in this way, ensuring the trustworthiness of food labelling information becomes paramount. In Australia, due to the prioritising of food safety risks in financially constrained regulatory environments, many of the label elements consumers are seeking to use to manage uncertainty about modern risks important to them – those falling within the 'consumer values issues' category – are left to industry to self-regulate (ANZFRMC, 2011). This reflects the mismatch in core values between consumers and policy agendas. This once again emphasises the need for meaningful consumer engagement and consultation in the formation of food policy and regulation.

This research adds to current understandings of consumer perceptions and management of risk by firstly recasting social, moral and ethical food risks as 'modern' risks. Secondly, the characterisation of labelling as both a symbol and tool by consumers for the management of uncertainty associated with food risks is entirely novel. Finally, the identification that labelling can act as a symbol to both reassure, and raise concerns, for consumers regarding risks is also new. As such it provides a much more nuanced understanding of both consumer

framings of food risk, and how consumers negotiate food labelling as a conduit to the food supply.

The use of adaptive theory (Layder, 1998) is a major strength of this study as it enabled a far more explanatory and useful understanding of this topic through the constant connection with social theory. A further strength is the use of qualitative methods facilitating deeper exploration and a more complete conceptual development of the topic, which has been previously described as complex and difficult to explain through unifying theories (Frewer, Shepherd, & Sparks, 1994). While we cannot make claims to representativeness based on the perceptions of this sample, the types of risk identified by these participants are similar to those raised by participants in larger, more representative studies of Australian consumers. Additionally, participants were free to express, and relatively emphasise, all their concerns relating to food production and consumption. This is an especially useful approach given that currently the research in the area is dominated with survey methods, in which researchers, not participants, delimit the risks to be evaluated. Reliance on self-report methods has previously been identified as a major weakness of current labelling research, primarily as it limits the ability to identify 'real-world' perceptions and use of labelling (Grunert & Wills, 2007). While this study utilised some observational data, it is unlikely this would satisfy proponents of the real-world setting as this was not conducted in a supermarket. Therefore this presents an opportunity for future ethnographic research to test the conceptual propositions developed through this exploratory research.

Conclusions

This research presents a novel perspective in the wealth of food risk literature, identifying food labelling as both a symbol of, and a tool for, the management of perceived risks for consumers within globalised food systems. Ultimately trust in labelling is always required as regardless of the pathway for uncertainty management there is a knowledge gap. Therefore it is imperative that food system actors ensure the trustworthiness of food labelling. The discrepancies in both the core values underpinning how risk is framed, and therefore the priorities for government intervention in food labelling, must be addressed through meaningful consumer engagement in policy decision making.

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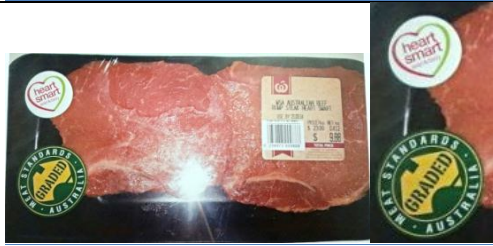
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Figure 1. the labelled and un/minimally-labelled chocolate and tea used as prompts in interviews

Table 1. Examples of packaging prompts used in interviews, with detail about label elements

Prompts chosen with specific label elements



Meat including 'meat standards graded' and 'Heart Smart' labels



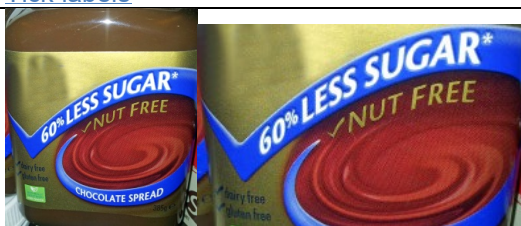
SAFCOL tuna including environmental label elements and '99% fat free' label



Cereal with extensive nutritional information and Australian made and Heart Foundation Tick labels



Herbal tea including many organic certification labels



Nut spread including 'nut, dairy and gluten free' labels and nutrient content claim



Nerada tea including 'pesticide free' label



Milk containing health claim label 'reduces cholesterol'



Soy milk including nutrient content claims, 'non-genetically modified' and 'Australian grown' labels

Table 2. The re-categorisation of risk types

Original risk category	Social, ethical, moral		Health
Original sub-categories		Introduced through human action	Inherent in food
Examples	Unfair trade, environmental destruction	Pesticides, additives	Allergens, spoilage
Theoretical risk category	Modern	Modern	Traditional

Table 3. Participant characteristics

Pseudonym	Gender	Age group	Shopping location	Place of birth	Food risk level	Shops for children
Colin	M	25-34	Supermarket	OA ^a , English language	Low	No
Lucy	F	25-34	Supermarket	Australia	High	Yes
Ruth	F	45-54	Alternative	OA, English language	Moderate	Yes
Isla	F	25-34	Supermarket	Australia	High	Yes
Ruby	F	18-24	Supermarket	Australia	High	No
Paula	F	35-44	Supermarket	Australia	High	Yes
Grace	F	25-34	Alternative	Australia	High	Yes
Thomas	M	55-64	Alternative	OA, English language	Low	No
Oliver	M	35-44	Supermarket	Australia	Low	No
Jack	M	>65	Alternative	OA, English language	Low	No
Hannah	F	>65	Alternative	OA, English language	Low	No
May	F	>65	Supermarket	OA, Non-English	Low	No
Margaret	F	>65	Supermarket	Australia	Low	No
Anne	F	>65	Supermarket	Australia	Moderate	No
Abbey	F	35-44	Supermarket	Australia	Low	Yes
Isaac	M	55-64	Local only	Australia	Low	No
Leo	M	18-24	Supermarket	OA, Non-English	Low	No
Fran	F	25-34	Supermarket	Australia	Moderate	Yes
Bruce	M	45-54	Local only	Australia	Low	No
Henry	M	45-54	Alternative	Australia	Low	No
Chloe	F	18-24	Supermarket	OA, English language	Low	No
Amelia	F	45-54	Supermarket	OA, Non-English	Low	Yes
Liz	F	55-64	Supermarket	Australia	Moderate	Yes
Lewis	M	18-24	Local only	Australia	High	No

^a OA, outside of Australia

Table 4. Key characteristics of the two pathways for managing uncertainty about risk using labelling

Role of labelling	Labelling as a <i>symbol</i>	Labelling as a <i>tool</i>
Uncertainty management pathway	Delegating control to others (trust)	Personal control through active food choices
Origin of risk	Naturally occurring	System-generated
Type of risk	Traditional risk	Modern risk
Level of perceived risk	Lower	Higher
Level of reflexivity regarding risk ^a	Lower	Higher
Level of reflexivity regarding trust ^a	Lower	Higher

^a Reflexivity meaning a consideration of the conditions relating to the situation of risk or trust (reflection), and an active rather than passive response to those conditions (Lupton, 2013).