The Risky Business of Food Waste: How to promote Change through Communication

Bethaney Turner and Joanna Henryks, University of Canberra, Australia

Abstract

There is a significant environmental, economic and social cost associated with food waste. In developed nations, most food wastage occurs post-consumer. Consequently, there is an acute need for effective communication strategies designed to encourage and assist consumers to reduce their domestic food waste. The development and adoption of campaigns such as Love Food Hate Waste in NSW and the national FoodWise initiative are steps towards achieving this. However, these programs have paid scant attention to the issue of food safety and, thus, have the potential to increase the prevalence of risky domestic food handling. This paper introduces the issue of food waste, places it in the context of risk communication related to food, and identifies the need to develop a richer understanding of the myriad of reasons that motivate the food handling practices of consumers in their homes. It argues that food safety messages in food waste reduction communication campaigns need to be strengthened through an incorporation of the everyday life experiences of consumers. It also advocates for greater transparency in the campaigns through an overt recognition that behavioural change around food waste may take a considerable amount of time and physical energy on the part of consumers. In this way, we contend that consumers will become more competent and empowered to perform the task of risk assessment on food in their homes.

Introduction

Approximately 40% of food in the developing world goes unconsumed as a result of inadequate storage, transportation and pest-inflicted damage (Gustavsson et al., 2011). In the developed world, such causes of food loss have been largely eradicated yet the actual percentage of food waste is comparable. In these wealthier nations, most food waste is generated post-purchase (Parfitt et al., 2010: 3065) with reports suggesting Australian households discard between $5–7.8 billion worth of food each year (Baker et al., 2009; Do Something, 2012). This has a considerable environmental impact, ranging from the wasting of water and phosphorous that went into the food's production to the resulting carbon emissions generated as it rots down in rubbish tips. As concerns related to climate change, peak oil and food security increasingly focus attention on improving sustainable living practices, the problem of food waste is starting to garner the attention of governments, community groups/social movements and the public. Indeed, it is becoming a key focus for social and environmental justice initiatives in Australia. Many of these initiatives are occurring at the grass-roots level and while not always systematic social movements, there is a growing number and diversity of collective action around food waste, including foragers, adherents of freeganism, dumpster divers and the many charities that are working to repurpose either fresh or pre-prepared food waste such as SecondBite and Ozharvest.

Communication and education strategies aimed at reducing this form of waste are also starting to be developed and adopted. NSW has adapted the Love Food Hate Waste strategy (LFHW)

from the UK, with the NSW Government's Office of Environment and Heritage (OEH) assuming responsibility for its management. The OEH is also funding smaller-scale initiatives to reduce and recover food waste in local government area around that State. In addition, the national FoodWise campaign is managed by the not-for-profit organisation, Do Something.

However, the reduction of food waste in the domestic environment carries with it possible health risks for consumers, related to illness brought about by the ingestion of spoilt, cross-contaminated or incorrectly prepared food. Food scares mobilised through ineffective risk communication have contributed to a population that is aware of risks inherent in the food system at large, but over-confident in its ability to assure the safety of food prepared in homes (Redmond and Griffiths, 2008; Frewer, 2000). LFHW and FoodWise communication campaigns are designed to provide information and education while promoting the creation of an online community, where people share the ideas and strategies they use to reduce food waste in their own homes. Information about food safety is provided, but it is not a key feature of the campaigns.

This paper contends that, in these campaigns, insufficient attention is being paid to the intimacy, complexity and embodied nature of the relationship between consumers, their waste and their everyday lived practices, values and behaviours related to food safety. It explores these issues and identifies some of the key areas that should be focused on to improve the positive health and environmental outcomes of the risk communication strategies related to reducing domestic food waste.

Exploring food waste and food safety

While the issue of food waste can no longer be ignored, until recently there has been a lack of waste data in Australia, resulting in difficulties in assessing the scope of the problem accurately (Baker et al., 2009). However from the information that is available at an individual level, food waste costs the average Australian household $616 per year, which equates to $239 per person or 145kg of food per person (Schapper, 2010). There is a general consensus that his may well be an underestimation. The most common food wasted is fresh fruit and vegetables (more than $1.1 billion), followed by restaurant and takeaway (over $1 billion), with meat and fish taking third place ($872.5 million) (Schapper, 2010).

Data appears to have been gathered more systematically in the UK. Parfitt et al. report on studies undertaken by the Waste and Resources Action Programme (WRAP) showing 'that household food waste has reached unprecedented levels in UK homes… with 8.3 Mt (millions of tons) of food and drink wasted each year… and a carbon impact exceeding 20 Mt of CO_2 equivalent emissions' (2010: 3074). There are three main categories for conceptualising food waste: avoidable, possibly avoidable and unavoidable. The first two are considered to be 'edible waste', that is food that could have been eaten at some point if people had cooked, frozen or desired to consume it. The category of 'possibly avoidable' directly relates to this issue of desire as it includes 'food that some people eat and others do not (e.g. bread crusts), or that can be eaten when a food is prepared in one way but not another (e.g. potato skins)' (Parfitt et al., 2010: 3073). The principal reasons for the loss of edible food are over-production, with people having 'cooked, prepared or served too much' and, secondly, not having consumed the food when it was in-date or before it had signs of having been spoilt (Parfitt et al. 2010).

Food waste is a social, economic, environmental and health issue. Research has identified the key consumer behaviours that produce it and communication campaigns such as LFHW and FoodWise have been developed to address these. The efforts to reduce food waste are often represented as necessary due to economic costs, the risk that wastage poses to the environment, and the ethical consequences of not making use of food. However, these communication strategies have not paid sufficient attention to the relationship between food waste reduction, health risk and people's understanding and behaviours related to safe domestic food handling. This is particularly interesting, given the population's growing concerns related to general food safety and people's high level of confidence in their own domestic food safety practices. Concerns related to outbreaks in the 1990s and the 2000s of BSE, salmonella, E-coli (most recently in Germany in 2011), debates about GM food, and a growing politicisation of what we eat in response to the 'obesity epidemic' have produced consumers who demand, and receive, more information about the food they buy from officially-sanctioned sources (Graham in Lofstedt, 2006:878). In many nations, this is coming from a wider range of institutional bodies than ever before as food safety concerns have led to the development of many 'independent food safety agencies' (van Kleef et al., 2006).

At the same time, however, there has been an increase in the number of food poisoning cases (McCarthy et al., 2007) with the number of incidents in England and Wales rising from 14,000 in 1985 to over 93,000 in 1998 (Yeung and Morris, 2001: 172). This rise suggests that, while people may be more aware of a threat to food safety, there is little behavioural change occurring in their homes in response to the food risk message. Indeed research into domestic food handling suggests that most people think about their practices with a high degree of 'optimistic bias', believing themselves to be at a lower risk of a food safety mishap than other people in society (Wilcock et al., 2004; Redmond and Griffith, 2004). This is supported by other studies such as Fischer et al., who report on people feeling they have greater knowledge of food handling practices and a higher degree of control over food safety in their homes than an average person. This 'optimistic bias', according to Frewer (2000: 32), makes it is more difficult for food safety and related public health messages to be conveyed and taken up by the public. Furthermore, in a study of consumers in South Wales, Redmond and Griffith found that many consumers feel confident in their food handling skills and these 'perceptions of invulnerability… may cause consumers to think interventions are meant for others rather than themselves' (2004: 307). In fact, few people are aware that 'at least 60% of food poisoning originates in the home' (Worsfold and Griffith in Wilcock, 2004: 57). Therefore, communication strategies designed to encourage people to rethink their food waste, must, at the same time be able to target effectively those consumers who may have an over-confidence in their food handling practices and an unsubstantiated feeling of control over domestic food safety – an over-confidence that could jeopardise their health (Redmond and Griffith, 2004).

Risk Communication and Food Safety

The principles of risk communication drive the manner in which food safety is presented to the public. Lofstedt (2006) outlines four key theoretical concerns in the communication of food research: how to communicate uncertainty and be transparent; the issue of social amplification – whereby 'psychological, social, institutional and cultural processes' impact on an individual risk perception; stigma – how to avoid specific foods being incorrectly represented as dangerous or bad); and trust – which usually relates to the faith citizens have in the authority providing the

food risk information. It has also been suggested that communicators should be willing to discuss the fact that it is not possible to attain 'zero risk' when dealing with food safety (Griffith et al., 1998). Increasingly, research is suggesting that, due to the inability to trust the food system absolutely, from production to consumer handling, consumers must be more involved in the risk assessment process. As Redmond and Griffith point out, 'communication messages should increase personal relevance and empower consumers to have control over their own food safety', going on to note that, '[t]his may be beneficial in the development of future social marketing based food safety education initiatives' (2004: 310). Furthermore, Fischer et al., suggest that consumers should be seen as 'risk manager[s], with responsibility for self-protection' (2005: 503-504). While there have been a number of studies reviewing these concerns, there has not been a concentrated body of work produced, which explores the issue of food risk communication as related to efforts to promote domestic food waste reduction. As a reduction of food waste becomes a key part of sustainable living initiatives, more work is needed to secure both positive environmental and health outcomes.

The literature on risk communication acknowledges that there is a significant divide between experts' and laypersons' understandings and interpretations of risk and that, traditionally, the focus has been on experts needing to inform and educate the public to bring about transformative behavioural and attitudinal change (Kirka et al., 2002). However, over the last decade, more research has been carried out to understand the multiple factors influencing an everyday person's risk perception (For an overview, see McCarthy and Brennan, 2009). 'At its best,' as Lofsted points out, 'risk communication is not a top-down form of communication from experts to the lay public. But rather a constructive dialogue between all those involved in a particular debate about risk' (2006:871). The work of Slovic on the psychometric paradigm has been important in promoting this shift in the 1990s through recognition and understanding of the psychological underpinning that informs consumers' understandings and beliefs about risk (Miles and Frewer, 2001). However, researchers have increasingly identified the limitations of this approach and the need for more qualitative methods to be used to further understand how and why people assess risk in relation to food hazards so differently to the 'experts' (Miles and Frewer, 2001; Hansen et al., 2003).

In response to this, within the field of risk communication, particularly related to research into food issues, there is a growing recognition and appreciation of the complexity of an individuals' everyday lived experiences, how these may give expression to their ethical systems and core values, and how this then impacts on decisions made about food risk. This is exemplified by Hansen et al., when they state:

> It seems that, if we are to build a complete picture of consumer attitudes toward food safety, we will need a broad understanding of the symbolic meanings that attach to different types of food, the circumstances in which it is bought and consumed, and the wider societal context in which its production and consumption takes place" (2003: 508).

People make decisions related to food purchase, handling and consumption for a myriad of reasons related to elements such as 'tradition, habit, pleasure or financial constraints' (Shaw in McCarthy et al., 2007: 552). The work of van Kleef et al. reaffirms the 2005 findings of Berg et al. by identifying that 'food consumption is largely a matter of routine behaviour or habit' (2006: 52). In a study of consumer interaction with risk communication related to specific 'food scares'

in Germany, Greece, Norway and the UK, Van dijk et al. noted that information was not taken up uniformly, instead, observing that the communication messages were impacted on by 'cultural variation' which they suggest may be 'rooted in historical precedents' (2008). This is echoed by Knox's research, in which she draws attention to the 'social and cultural' influences on risk perception noting that 'food choices and food risk perceptions across societies are… motivated by culturally relevant ethical concerns' (2000: 101).

Effective risk communication strategies related to reducing domestic food waste can only be developed if we have a strong understanding of the values and ethics motivating food handling and consumption practices. Some researchers also suggest there is a need to explicitly research the link between these 'values' and the role of emotion in decision-making processes related to food safety (van Kleef, 2006), referring to this as the affect heuristic (Fischer, 2005; Verbeke et al., 2007). Fischer et al. highlight the potential significance of emotion and the need for further research on this issue when they write:

> Among the different actions humans conduct daily, food consumption is likely to be among those most likely to be influenced by emotion. Many food-related decisions are at least partially made through affective evaluations. One of the basic emotions, disgust, is clearly related to food safety… Despite these indications of the importance of affect in food-related issues there is little research specifically focusing on affect and risk perception of food safety and on safe food handling (2005: 508).

This paper aims to flesh out some of these issues in relation to people's engagement with waste in Australia. In doing so, it maps out some of the complexities of everyday lived experiences that must be factored into the communication strategies designed to promote a reduction in food waste, while simultaneously ensuring food safety.

Mapping the complexities of food waste: The role of emotions, bodies and time

Existing food waste research mostly looks at the problems inherent in international agri-business (or groups challenging the dominant food system), the environmental impact of waste, the cost incentive to reduce waste, and the potential for positive societal or community impacts – in terms of social justice – if food waste is repurposed through organisations such as Secondbite and Ozharvest. In the literature, there has been no specific focus on the health aspects related to reducing food waste in domestic homes. This section explores this issue by taking up Fischer et al.'s (2005) calls to better understand the role of emotion, and expands this to include the role of the body, in people's relationship to food waste. Here we explore the intimacy, complexity and embodied nature of the relationships between citizens and their everyday life experiences with food waste and suggest ways in which this could be factored into the health communication elements of strategies designed to reduce domestic food waste.

Hawkins (2006) articulates the need for a new ethics of waste, asking citizens to think through the productive and potentially positive relationships we can form with waste. Such ideas challenge accepted societal values whereby, in the developed world, the majority of our bodies have been habitualised into the routines required to eliminate or hide waste. Cleanliness is about removing it from our homes, putting it in the bins, having it taken away. However, most food justice groups and the communication strategies of LFHW and FoodWise are calling for a more

creative, a more engaged and a closer relationship with food waste. Foragers and adherents of freeganism and dumpster divers are some of the more radical categories that have sprung up to challenge the way people think about food waste. The charities such as Second Bite and Ozharvest have also promoted a rethinking of the possibilities of repurposing what once would have been waste. However, in these examples, the food no longer being wasted is either publically available and free or a left-over from commercial businesses. In the latter case, the repurposing is often a way of challenging the many inbuilt inefficiencies in the international industrial food system that produce such unnecessary excesses at many points along the commodity chain. In the case of dumpster divers, in particular, their actions can be conceived of as an openly ethical and political act.

People engaged in the activities outlined above demonstrate the capacity and willingness to change their habits and bodily actions to engage more productively with the food system (Edwards and Mercer, 2007). For this group their bodies are intimately engaged with waste, or with a rethinking of it. As Edwards and Mercer in their study on freeganism point out, they don't rely on the declaration of the industrial food system (so, use-by or best-before dates) to make a decision about what to eat. Instead, 'they use their innate senses of touch, taste and smell' to make their food choices (Edwards and Mercer, 2007: 290). While dumpster divers are a minority in society, it is this ability to take a sensorial approach to food quality and safety that is one aspect of what is being asked of people in the LFHW and FoodWise campaigns. A major problem here, however, is that it is very difficult to facilitate people's ability to do this safely through the use of communication strategies. These are bodily practices and sensorial experiences. The type of knowledge and capacity to assess what is safe to eat without resorting to labelling (which some argue is too cautious in its approach and is, thus, identified as contributing to the food waste problem) is a habitualised skill usually learnt in the home. However, we know that since the advent of the industrial agriculture system, people (particularly those in cities) have become increasingly disconnected from the food system. Less of this knowledge and ability is being passed on in domestic kitchens. Whilst these campaigns are making a concerted effort to provide information for people to fill this knowledge gap, more is needed, particularly in relation to promoting a level of food competency that will ensure a safe reduction in food waste. These campaigns must acknowledge that these competencies will take a significant investment in time on behalf of the consumer to achieve.

The Love Food Hate Waste campaign in NSW is designed, according to its website, to: 'help you avoid food waste, save time and money and reduce your environmental impact by planning better, shopping smarter and storing food effectively'. It also encourages people to share their tips to avoid food waste, and many people have taken up this opportunity compiling a rich and useful information resource for those motivated to reduce food waste in their household. However, while most people identify a desire to reduce their food waste, their behaviours do not always work in consonance with these values and beliefs. A policy brief produced by the Australia Institute in 2009 identified that 84% of Australian consumers express a sense of guilt at discarding food, but this does not prompt them to alter their behaviour.

Guilt and moralising do not always motivate action. This is evident in research into demand management strategies designed to reduce water use. While they work to some extent, they don't achieve the radical reduction that is usually desired (Strang 2004; Allon and Sofoulis 2006; Po et al. 2005; Gilg and Barr 2006). Some suggest that such approaches actually limit the engagement of the community in sustainable ecological living. Indeed, Allon and Soufoulis point

out that, in relation to water, ‘efforts to simply persuade or “demand” that people use less water, take fewer, shorter showers, or rip up their lawns and plant natives, are unlikely to succeed on their own.’ because ‘The social and cultural values underscoring the importance of the daily shower or the lawn as a contemporary sign of identity are likely to simply work against and ultimately override the need for change’ (2006: 54). These social and cultural values relate to personal normative beliefs, a sense of identity and also habitualised bodily actions and emotions. When working on food waste, researchers should not forget that people encounter it on a daily basis and deal with it through ingrained, habitualised bodily actions. Not only is the food we consume related to traditions, habits, values and beliefs, but so too is the food we waste. The micro-political level of individuals, their habits, behaviours, and ethics and their resulting complex understanding of – and relationships to – food waste need to be given greater attention in the development of communication strategies designed to reduce domestic food loss. There also needs to be more transparent acknowledgement of the investment of time it may take to alter these habits.

The Love Food Hate Waste campaign suggests saving waste can save time. However, engagement with food, the food system and food waste, takes time and bodily energy. Storing correctly, learning new recipes or cooking techniques, checking regularly and then composting or redistributing can be an on-going and time-consuming process. This issue of time is particularly relevant to risk communication related to food. Perceived time pressures are commonly cited as the reason people consume less healthy ‘fast or ready-made food’. To consume these products regularly, people must have trust in the food system. In fact, as Siegrast has found, consumers who most readily take on the food messages provided by the authorities are those who don’t have ‘the interest, time, ability, knowledge and/or other resources to personally make decisions and take actions’ (Siegrist et al. in McCarthy and Brennan, 2009: 553; see also Poortinga and Pidgeon, 2005). People who identify in this way are engaged in a process of trade-offs whereby, to save time, they may be willing to ‘accept the potential risk associated with less than ideal food handing practices’. McCarthy and Brennan (2009) assert that the first thing that needs to happen to alter food handling behaviour is to persuade people to ‘alter their time and energy priorities’. They go on to point out that to effect such significant behavioural change we need to know more about these consumers: what they know; where and how they practice food safety; their food habits and history; and details about their everyday life experiences and practices.

So it is our contention that risk communication strategies designed to reduce food waste need to represent the issue of time more accurately. The literature in the field indicates that the communication of uncertainty, and the need to be transparent in providing information, are key to the success of food risk communication messages (see Lofstedt, 2006). Consequently, communication strategies must acknowledge that reducing food waste will, for many, require a significant investment of time and bodily energy. The importance of a rethinking and revaluing of time to broader practices of ethical consumption has previously been identified by Parkins and Craig who note that such practices of consumption are ‘premised on an alternative approach to the consumption of time – how we use time, how we value time, how we measure time’ (2010: 190). They also point out that: ‘…in order to better understand the practices of ethical consumption, and sustainable living more generally, we need to acknowledge the emotional, sensory and material dimensions associated with such activities’ (2010: 190). The current strategies adopted by LFHW and FoodWise do not adequately attend to these issues.

Conclusion

There is a significant environmental, economic and social cost associated with food waste. The majority of food wasted in developed nations occurs post-consumer. Consequently, there is an acute need for effective communication strategies designed to encourage and assist consumers to reduce their domestic food waste. The development and adoption of campaigns such as Love Food Hate Waste in NSW and the national FoodWise initiative are steps in the right direction towards achieving this. However, these programs have paid scant attention to the issue of food safety and thus have the potential to increase the prevalence of risky domestic food handling. To avoid this, these campaigns need to incorporate a more in-depth understanding of the habits, practices and beliefs that inform consumers' perception of food risk in their homes. More research into these everyday lived experiences is needed, particularly in relation to exploring the role of emotion and reliance on senses to assess food risk. These communication campaigns should also adopt best practice from the field of food risk communication research that clearly points to the need for transparency, if messages are to be effectively communicated. There should be an acknowledgement of the time and bodily energy that will be required of consumers to change their food handling practices and greater focus on the fact that food safety cannot be guaranteed. In this way, we may well more effectively empower consumers to act as risk assessors more capable of significantly reducing their food waste without resulting in adverse health outcomes.

References

Allon, F., and Sofoulis, Z., 2006, 'Everyday water: Cultures in transition', *Australian Geographer,* 37 (1), pp. 45–55

Baker, D., Fear, J. and Denniss, R., 2009, *What a waste: An analysis of household expenditure on food,* The Australia Institute

Edwards, F., and Mercer, D., 2007, 'Gleaning from gluttony: An Australian youth subculture confronts the ethics of waste', *Australian Geographer,* 38(3), pp. 279–296

Gilg, A. and Barr, S., 2006, 'Behavioural attitudes towards water saving? Evidence from a study of environmental actions' *Ecological Economics,* 57, pp. 400–414

Gustavsson, J., Cederberg, C., van Otterdijk, R., and Meybeck, A., 2011, *Global food losses and food waste: Extent, cause and prevention,* Food and Agriculture Organisation of the United Nations

Fischer, A.R.H., de Jong, A.E.I., de Jone, R., Frewer, L.J. and Nauta, M.J., 2005, 'Improving food safety in the domestic environment: The need for a transdisciplinary approach', *Risk Analysis,* 25 (3), pp. 503–517

Frewer, L., 2000, 'Risk perception and risk communication about food safety issues', *British Nutrition Foundation Nutrition Bulletin,* 25, pp. 31–33

Frewer, L.J., and Miles, S., 2003, 'Temporal stability of the psychological determinants of trust: Implications for communication about food risks', *Health, Risk and Society,* 5 (3), pp. 259–271

Griffith. C., Worsfold, D. and Mitchell, R., 1998, 'Food preparation, risk communication and the consumer', *Food Control,* 9 (4), 225–232

Hansen, J., Holm, L., Frewer, L., Robinson, P. and Sandoe, P., 2003, 'Beyond the knowledge deficit: Recent research into lay and expert attitudes to food risks', *Appetite,* 41 (2), pp. 111–121

Hawkins, G., 2006, *The ethics of waste: How we relate to rubbish,* Rowman and Littlefield, Lanham, Maryland

Kirka, S.F.L., Greenwood, D., Cadea, J.E. and Pearman, A.D., 2002, 'Public perception of a range of potential food risks in the United Kingdom', *Appetite,* 38

Knox, B., 2000, 'Consumer perception and understanding of risk from food', *British Medical Journal,* 56 (1), pp. 97–109

Lofstedt, R. E., 2006, 'How can we make food risk communication better: Where are we and where are we going?', *Journal of Risk Research,* 9 (8), pp. 869–890

McCarthy. M., Brennan, M., Kelly, A.L., Ritson. C., de Boer, M. and Thompson, N., 2007, 'Who is at risk and what do they know? Segmenting a population on their food safety knowledge', *Food Quality and Preference,* 18 (2), pp. 205–217

McCarthy, M., and Brennan, M., 2009, 'Food risk communication: Some of the problems and issues faced by communicators on the Island of Ireland (IOI)', *Food Policy,* 34 (6), pp. 549–556

Miles, S. and Frewer, L.J., 2001, 'Investigating specific concerns about different food hazards,' *Food Quality and Preference,* 12 (1), pp. 47–61

Parfitt, J., Barthel, M., and S. Macnaughton, 2010, 'Food waste within food supply chains: Quantification and potential for change to 2050', *Philosophical Transactions of the Royal Society Biological Sciences,* 365, pp. 3065–3081

Parkins, W., and Craig, G., 2010, 'Slow living and the temporalities of sustainable consumption,' T. Lewis and E. Potter (Eds), *Ethical Consumption: A critical introduction,* Routledge, London

Po, M., et al., 2007, 'Predicting community behaviour in relation to wastewater reuse: What drives decisions to accept or reject?', *Water for a Healthy Country: National Research Flagship,* CSIRO Land and Water, Perth

Poortinga, W. and Pidgeon, N.F., 2005, 'Trust in risk regulation: Cause or consequence of the acceptability of GM food?', *Risk Analysis,* 25 (1), pp. 199–209

Redmond, E.C. and Griffith, C.J., 2004, 'Consumer perceptions of food safety risk, control and responsibility,' *Appetite,* 43 (3), pp. 309–313

Schapper, J. and Chan, S., 2010, 'What is wrong with food waste?', *Food Australia,* July

Strang, V., 2004, *The meaning of water,* Berg, Oxford, UK

Van Dijk, H., Houghton, J., van Kleef, E., van der Lans, I., Rowe, G. and Frewer, L., 2008, 'Consumer responses to communication about food risk management' *Appetite,* 50 (2–3), pp. 340–352

Van Kleef, Frwer, L.J., Chryssochoidid, G.M., Houghton, J.R., Korzen-Bohr, S., Krystallis, T., Lassen, J., Pfenning, U. and Rowe, G., 2006, 'Perceptions of food risk management among key stakeholders: Results from a cross-European study', *Appetite,* 47 (1), pp. 46–63

Verbke, W., Frewer, L.J., Scholderer, J. and De Brabander, H.F., 2007, 'Why consumers behave as they do with respect to food safety and risk information', *Analytica Chimica Acta,* 586 (1–2), pp. 2–7

Wilcock, A., Pun, M., Khanona, J. and Aung, M., 2004, 'Consumer attitudes, knowledge and behaviour: A review of food safety issues', *Trends in Food Science and Technology,* 15 (2), pp. 56–66

Yeung, R.M.W., and Morris, J., 2001, 'Food safety risk: Consumer perception and purchase behaviour', *British Food Journal,* 103 (3), pp. 170–186