

**INFLUENCES ON BEHAVIOUR
TOWARDS FOOD-RELATED
HEALTH RISKS: A PILOT STUDY**

by

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Abstract

This pilot study was designed to develop a method of eliciting information about eating behaviour, food-related health risks, and the issue of BSE/nvCJD in particular. Interest and attention in this subject area has been increasing throughout the 1990s as one health scare follows another. As yet the processes involved in public reaction to food-related risks and resulting behaviour are not fully understood.

Undergraduate students were used as a readily accessible subject source. It is accepted that this will not be truly representative of the general public, but it did allow for information to be collected and the questions to be tested on a relatively large number of people. The finalised method will be used to undertake a large scale study on members of the general public in the Norwich area.

The results show low levels of trust in the UK Government, the mass media, farmers and the food industry. The respondents were generally in favour of experts making decisions about food safety, but wanted more public consultation and involvement. Further legislation dealing with food risks was not advocated but improved information and consumer choice was popular. Most respondents were in favour of an independent Food Standards Agency, allowing for experts to make decisions whilst being independent of the Government and industry.

1. Introduction

1.1 Food safety issues in recent years

In the last 10 years food safety has become an increasingly prominent issue for both the media and public interest. The pattern of media scare followed by Government and scientific announcements started with salmonella in eggs (1988), and continued with listeria in soft cheese (1990), toxins in apple juice (1993), and E. Coli in cooked meats (1996) (Maxwell, 1997). To date management of food safety issues has not been entirely successful either in terms of the actual risk or public perception of the risk. Different types of food hazards are likely to give rise to a variety of public risk perceptions.

1.2 BSE/nvCJD

The salmonella and listeria scares were soon overshadowed by Bovine Spongiform Encephalopathy (BSE). First identified by the Ministry of Agriculture, Fisheries and Food (MAFF) in late 1986, by June 1988 BSE was made a notifiable disease. One month later, following scientific advice, the Government introduced a ban on ruminant-derived meat and bone meal. The incidence of BSE in cattle peaked at the end of 1992 and then decreased throughout the next four years (Collee and Bradley, 1997). Then, on 20 March 1996, Stephen Dorrell, Secretary of State for Health, announced that there may be a link between BSE and a new variant in human Creutzfeldt-Jacob Disease (nvCJD).

The BSE case has involved a complex and difficult combination of issues summarised by Maxwell (1997). These include:

- the political handling of risk;
- the public explanation of uncertainty in risk;
- acceptability of risk levels;
- the interface and communication between scientists and civil servants and politicians;
- MAFF's multiple role of promoting agriculture and fisheries whilst policing the production of food;
- lack of scientific evidence or knowledge;
- resistance by government and establishment scientists to consider other research;
- the involvement of other stakeholders such as supermarkets, the food industry, farmers, and so on;
- the media's role both as public information source and sensationalising the story to sell papers;
- the European dimension.

1.3 Food standards agency

In January 1998, the Government produced a White Paper on the Food Standards Agency (Stationery Office, 1998). It is proposed that most food safety matters will be transferred to the Agency, which will report to the Health Secretary (ENDS, 1998, 276). The Food Standards Agency will be established as a QUANGO and is expected to come into being in late 1999. Following a report by Professor Philip James (1997) the White Paper identified three main areas of concern: “the conflict of interest within the Ministry of Agriculture, Fisheries and Food (MAFF) between its responsibilities for food safety and its role as sponsor of the farming and food industries; fragmentation among the various government bodies responsible for food safety, and; uneven enforcement of food law” (ENDS, 1998, 276, p39).

The White Paper is not clear on methods for dealing with scientific uncertainty: “where there is a risk of serious damage to public health, lack of full scientific certainty should not be used as a reason for postponing cost-effective measures to reduce the health risks. Where it is not possible to identify a safe threshold of intake in relation to an identified hazard, any risk from exposure should be reduced to as low a level as is reasonably practicable” (Stationery Office, 1998).

In this study, we examine issues surrounding the operation of a Food Standards Agency, such as who the public trusts regarding matters of food safety, and what new legislation or regulatory procedures would be favoured. We also focus on BSE/nvCJD as a specific problem, examining issues of trust and blame which have arisen.

1.4 Cultural theory

As part of the questionnaire, we included a quantitative test of cultural theory. Cultural theory describes forms of social solidarity which shape world views and influence judgements about fairness, trust and accountability. It argues that people will react to risks in accordance with the way society itself is perceived and the legitimacy which they ascribe to institutions and rules of procedure.

Cultural Theory was originally proposed by Douglas (Douglas, 1982; Douglas and Wildavsky, 1982) and has been developed by others (Schwarz and Thompson, 1990; Thompson *et al.*, 1990; Rayner, 1992). It consists of two components. The first is the theoretical belief that adherence to a specific pattern of social relationships generates a distinctive way of looking at the world, referred to as a ‘cultural bias’, and conversely, that adherence to a certain worldview or cultural bias legitimises a corresponding type of social relations.

The second component is the definition of four viable cultural groups based on two dimensions, ‘*group*’ and ‘*grid*’. Thompson *et al.*, (1990) interpreted these dimensions as follows: “Group refers to the extent to which an individual is incorporated into bounded units. The greater the incorporation, the more individual choice is subject to group determination. Grid denotes the degree to which an individual’s life is circumscribed by externally imposed prescriptions. The more binding and extensive the scope of the prescriptions, the less of life that is open to individual negotiation.” (Thompson *et al.*, 1990, p.5). Representing these variables as a pair of orthogonal axes produces four quadrants, each one corresponding to a cultural solidarity defined by the strength of its grid and group characteristics. The four solidarities are described as follows:

- Hierarchists - characterised by strong group boundaries and binding prescriptions (high group, high grid). Hierarchists will tend to see an individual’s place in the world as defined by a set of institutional classifications, e.g. based on age or gender. These demarcations are not questioned, but justified on the grounds that they enable the society to run smoothly. Control is vested in formal, hierarchical systems of authority.
- Egalitarians - characterised by strong group boundaries but little belief in prescribed roles (high group, low grid). Egalitarians have a strong sense of society but expect each individual to negotiate their relationship with others and no individual is granted authority by virtue of their position.
- Fatalists - characterised by low group association but a strong sense of social distinctions (low group, high grid). Like hierarchists, fatalists’ autonomy is controlled by systems and institutions, but they see themselves as excluded from these institutions and therefore ‘outsiders’ with little or no power.
- Individualists - characterised by no group incorporation and no prescribed roles (low group, low grid). Individualists feel no responsibility towards other members of society and allocation of power and resources is by competition, not by position or status (Douglas, 1982; Douglas and Wildavsky, 1982; Jenkins-Smith, 1994; Thompson *et al.*, 1990).

Dake (1991) devised a set of statements about society which would provide a measure of the four solidarities, which was used in a psychometric evaluation of risk perceptions by Marris *et al.*, (1996). From the original set of 46 questions, a subset of 12, three each for hierarchy, egalitarianism, individualism and fatalism were chosen by Langford *et al.*, (1998) for use in subsequent surveys where the full version of the questionnaire could not be used due to its length. These 12 questions were chosen by hierarchical cluster analysis to be most representative of the four solidarities measured by Dake’s set of items, and worked well in distinguishing between the four solidarities (Langford *et*

al., 1998). The questions produce four continuous scales which can be analysed in relation to other factors measured in the study.

2. Method

The aim of this study was to examine the role of trust and blame in individuals perception of the food industry and BSE crisis in particular. To achieve this we developed a self completion questionnaire entitled “Eating Habits Questionnaire”. The study was undertaken at the University of East Anglia in March 1998. The questionnaires were administered to first and second year undergraduate law students, who were chosen because of their level of understanding of regulatory processes and procedures. The students were handed a questionnaire by research staff as they arrived for lectures. They were asked to complete the questionnaires in 15 minutes before the start of the lecture. The lecture periods used were delayed slightly with the permission of the lecturers to enable completion. The questionnaires were completed individually, without assistance and either returned to the researchers at the end of the lecture or placed in a box in the School of Law.

The questionnaire consisted 50 questions in six sections. These covered: past and present eating behaviour and attitudes; trust and accountability; attitudes to BSE; cultural theory questions; demographic information; and risk perceptions.

- Section 1 elicited information on consumption of various food items five years ago, any changes made since and current consumption. They were also asked to give reasons for changes to eating habits.
- Section 2 asked respondents to assess the sufficiency of the information available for making food safety decisions. They were also questioned on who they trusted to make decisions on their behalf and how they would like such decisions implemented.
- Section 3 looked at whether respondents had given up eating British beef as a result of BSE, including when and for how long. They were asked to assess their perception of the risk to the British public from BSE. This was followed by a series of questions on who they felt was to blame for the BSE crisis and who they would trust to tell them the truth about BSE. They were also asked whether they felt the British farming industry had been treated fairly over BSE and whether they should receive compensation for loss of earnings as a result of BSE.
- Section 4 consisted a series of questions developed from Carl Dake’s (1991) psychometric scales for measuring cultural theory.
- Section 5 requested personal information such as gender, level of study, age, occupation of main wage earner. Finally respondents were asked questions

about the level of risk to themselves from a variety of activities and technologies.

All of the 200 questionnaires were given out on a single day, 105 were returned complete (response rate of 52%). Eight were returned significantly incomplete or spoilt. It is acknowledged that there may be some respondent bias, as those people who feel more strongly about food safety and the trustworthiness of the Government are more likely to complete the questionnaire. For this initial pilot study the self completion questionnaire consisted mostly of closed questions. This has obvious limitations but does provide an insight into the important issues and concerns. In the larger study a mixed methodology of questionnaires linked to focus groups or semi structured interviews will be used. The data were analysed using chi-square tests, analyses of variance and logistic regression analysis.

3. Results

3.1 The sample

Of the 105 students who completed the survey, 65% were female and 35% male. The students came from a variety of geographical locations, with roughly equal proportions of respondents living in urban, suburban, rural, and a mixture of the above in childhood (19%, 35%, 26%, 20% respectively). Nearly all of the respondents were undergraduates (89%), and most of the respondents were studying for an LLB in law (83%) the remainder were studying law with an European language or diploma in law. The majority of students were from social classes I and II (57%) and social class IIIIn (20%). 39% of respondents were in the 16-19 year age group and 47% were between 20-29 years of age. 89% of the sample were British and 7% were European nationals.

3.2 Food Safety

Food safety was of particular interest to 60% of respondents, 30% of respondents were not interested, 10% were not sure. Nearly half of respondents felt they had enough information to make decisions on which foods are safe to eat (42%). An equal number felt they did not have sufficient information (44%) and the remaining respondents were unsure (14%).

When asked what additional information the respondents required to make food safety decisions, a significant proportion (of those who wanted additional information) wanted more, up-to-date, accurate, consistent, independent, reliable, honest, truthful, non-conflicting information (38%, n=16). Almost a third of respondents wanted more, better, accurate, exact labelling, giving details of ingredients and country of origin (29%, n=12). Some respondents wanted more specific information on chemicals, pesticides and supplements used, and specific health risks such as carcinogenic effects (19% n=8).

Most people felt that experts and policy makers should determine which foods are safe (64% yes, 26% no, 10% not sure, n=103). 82% of respondents felt the public should be widely consulted about food safety (14% no, 4% not sure, n=103). Trustworthiness of the Government and its agencies was important to 88% (n=101) of respondents.

Consumer organisations were most trusted to make decisions about food safety, by 79% of the respondents. The Government and its agencies, the food industry and the European Union received 33%, 26% and 33% respectively. Nearly all of the respondents said they would trust an independent food standards agency to make decisions about food safety on their behalf (94%).

Processes involved in trust and blame are much broader than individual cognitive psychology. Previous studies have shown that cultural theory can be useful in interpreting public perception of risk (O’Riordan, *et al.*, 1997). It has been used here to assess trust in regulatory arrangements and Government and other institutional agencies. The responses from the cultural theory questions were used to develop a score for each respondent for each of the four solidarities. The sufficiency of the information and who they trusted to make decisions on their behalf were analysed against sex and the four different cultural theory solidarities using logistic regression. The results of this analysis are presented in Table 1. Higher scores on the egalitarian and fatalism scales were strongly associated with respondents feeling that they did not have sufficient information to make decisions on which foods are safe to eat ($p<0.01$). A high score on the egalitarianism and hierarchy scales was mildly associated with a greater interest in food safety ($p<0.1$). Fatalism was associated with a lack of interest in food safety ($p<0.05$).

Egalitarianism was associated with trusting the Government and its agencies and the European Union to make decisions on food safety ($p<0.05$), and believing experts and policy makers should make decisions on which food was safe to eat ($p<0.01$). As a result, Egalitarianism was weakly associated with seeing the trustworthiness of government as important ($p<0.1$). Fatalism was associated with not trusting the Government or experts and policy makers to make decisions about food safety ($p<0.05$). Fatalism and being female was, however, associated with trusting the food industry ($p<0.05$). Individualism was associated with trusting consumer organisations to make decisions about food safety ($p<0.05$) and the trustworthiness of the government not being important ($p<0.05$) as they believe in market based solutions.

Only 14 % ($n=99$) of respondents advocated the introduction of new legislation as a method of managing health issues. 85% ($n=99$) wanted the information of be provided and then to be allowed to make a personal choice. Setting up of an independent panel of experts to decide on food safety issues was supported by 46% ($n=99$) of respondents.

Table 1: Logistic Regression results for cultural solidarities

	Sex Female	Egalitarianism	Hierarchy	Fatalism	Individualism
Sufficient information		- - -		- - -	
Interested in food safety		+	+	- -	
Experts and policy makers should decide which foods are safe		+ + +	+	- -	
Trust Government to make decisions on food safety		+ +	+	- -	
Trust consumer organisations to make decisions on food safety					+ +
Trust food industry to make decisions on food safety	+ +			+ +	
Trust food standards agency to make decisions on food safety					
Trust EU to make decisions on food safety		+ +			
Trustworthiness of government is important		+			- -
p <0.1 + / -	p <0.05 + + / - -	p <0.01 + + + / - - -			

NB: nearly every respondent would trust an independent food standards agency to make decisions on food safety

3.3 BSE

The term ‘BSE crisis’ was left undefined to allow respondents to use their own definition. As a result there were two ways of interpreting this question, either who had caused the infection of the UK beef cattle with BSE or who had turned the situation into a ‘crisis’.

Approximately a third of respondents had stopped eating British beef as a result of BSE (30% n=103). Most of the people who had given up British beef, had done so in the last three years (79% n=24). A few people had not given up eating beef because they were already vegetarian or had moved to the UK from another country in the last few years. As a result a larger proportion of people were currently not eating British beef (37% n=102). 67% of people felt that risk of BSE to British public, was low or quite low, 14% medium and 19% thought it was high or quite high (n=102).

In a multiple logistic regression we analysed whether respondents ever stopped eating UK beef or not because of the BSE crises. Three variables were found to be important, and these are shown in Table 2. A decision to stop eating UK beef was associated with a perception of not having enough information on which foods are safe to eat, and a belief that experts and policy makers should determine which foods are safe to eat. A general interest in food safety was positively associated with the decision to stop eating UK beef.

Table 2: Odds ratios from multiple logistic regression analysis of whether respondents ever stopped eating UK beef because of BSE

	Odds Ratio	95% CI	p
<i>Having sufficient information to make decisions on which foods are safe to eat</i>	0.30	0.09 – 0.98	0.048
<i>Experts and policy makers should determine which foods are safe</i>	5.63	1.12 – 28.31	0.036
<i>Personal interest in food safety</i> (n = 77 cases used)	4.63	0.91 – 23.57	0.065

Respondents were also asked to evaluate how big a risk they felt there was to the British public from BSE. The variable was recoded as a binary variable scoring 0 for no or low risk, and 1 for medium to high risk. The same three explanatory variables were significant in a logistic regression analysis (Table 3). Hierarchy was also associated with perception of higher risk (odds ratio = 2.84, 95% CI 1.20 – 6.73, $p = 0.017$).

Table 3: Odds ratios from multiple logistic regression analysis of whether respondents felt the risk to the general public from BSE was medium to high

	Odds Ratio	95% CI	p
<i>Having sufficient information to make decisions on which foods are safe to eat</i>	0.19	0.04 – 0.80	0.024
<i>Experts and policy makers should determine which foods are safe</i>	8.32	1.41 – 48.94	0.019
<i>Personal interest in food safety</i> (n = 67 cases used)	16.34	1.77 – 151.0	0.014

The people perceived as most to blame for the BSE crisis were the UK Government, the food industry and the farmers (Figure 1). Respondents did not believe that consumer organisations or consumers were to blame.

Respondents most trusted scientists and doctors to tell them the truth about BSE (51% and 40% respectively) (Figure 2). The UK Government, farmers, the food industry, the newspapers, television and radio, were each not trusted by roughly 60 per cent of the respondents.

Fifty-nine per cent of respondents did not think the British farming industry has been fairly treated over the BSE issue, 28% thought they had been fairly treated and 13% did not know (n=104). Sixty-three per cent of respondents thought farmers should receive compensation for loss of earnings over the BSE crisis, 18% thought they should not receive compensation and 19% did not know (n=104).

Figure 1: Who do you believe is to blame for the BSE crisis?

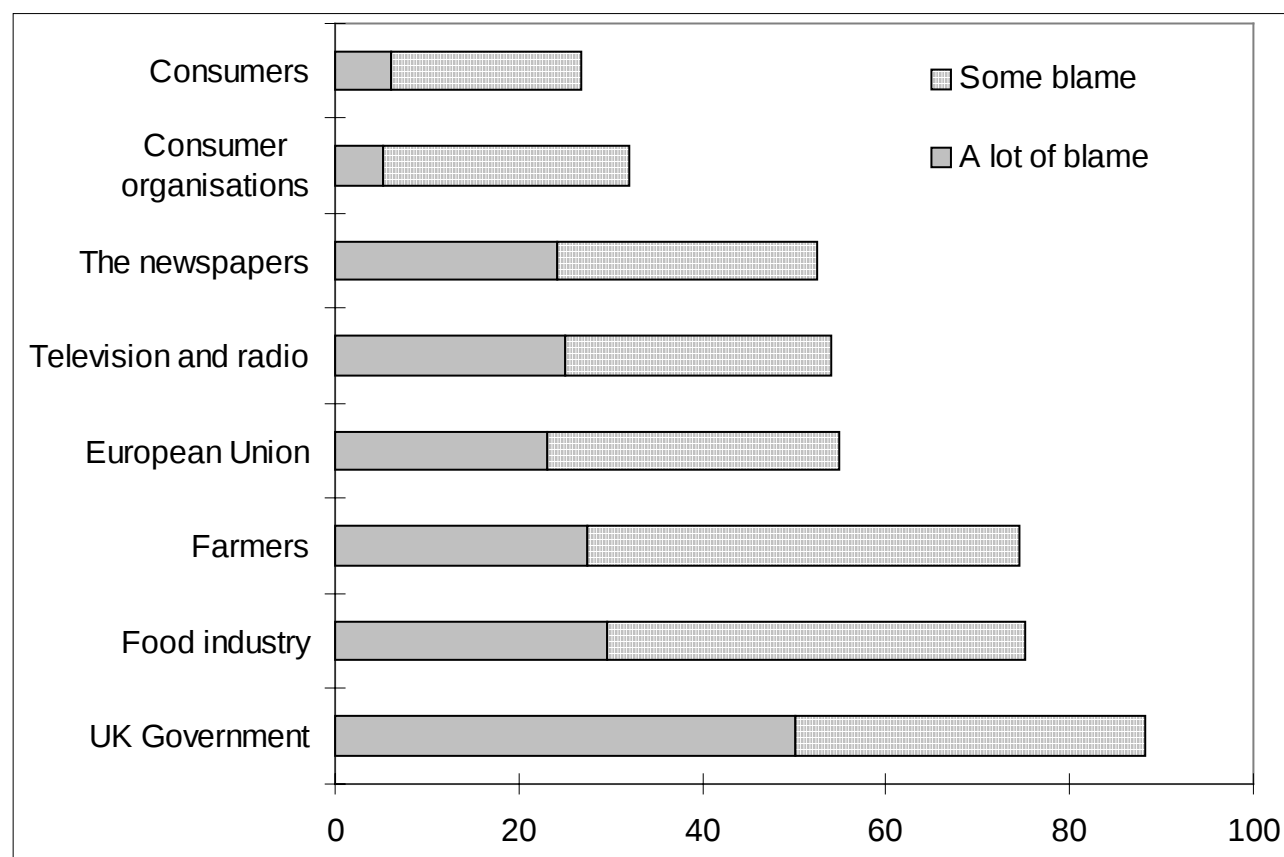
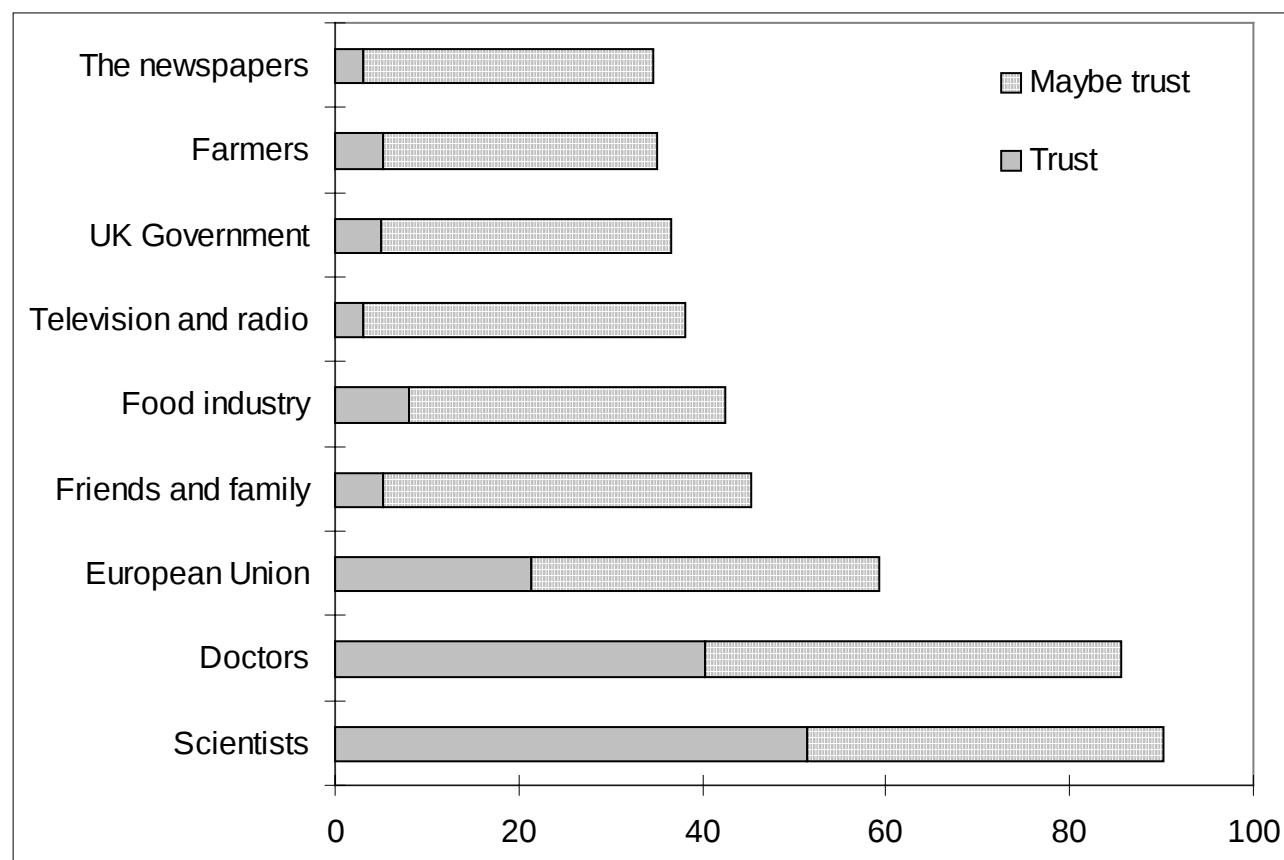


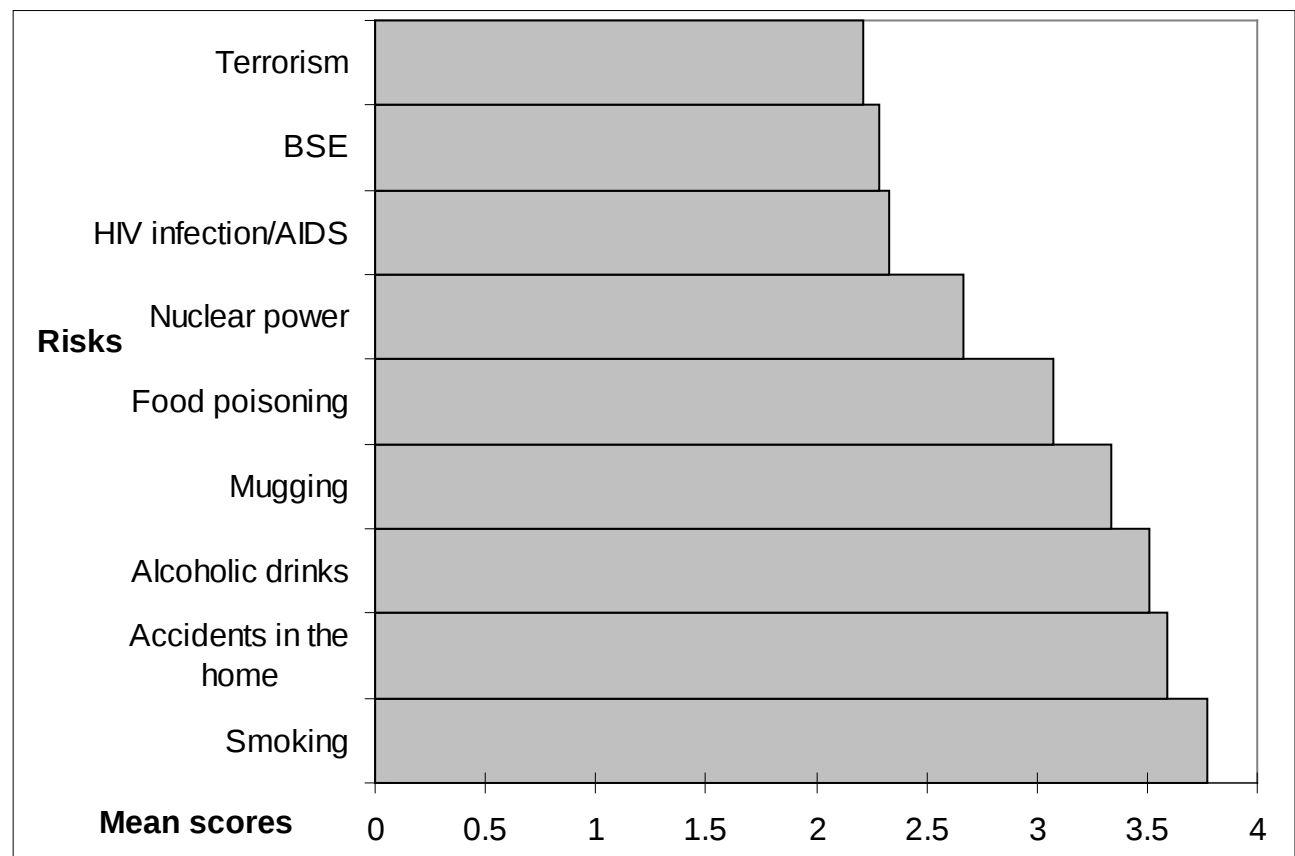
Figure 2: Who would you trust to tell you the truth about the BSE crisis?



3.5 Risks in perspective

Figure 3 shows the mean scores of risk to the individual. BSE has a relatively low risk score of just over 2. This is on a par with terrorism and HIV infection/AIDS. There is a considerable difference between perceived personal risk from BSE and the risk to the general public where a third of respondents reported that the risk as being medium or high.

Figure 3: Perception of risk to own health



3.6 Eating Habits

The most common reasons given for eating habits 5 years ago were, parental cooking (46% n=27), likes and dislikes (19% n=11) and being vegetarian or vegan (14% n=8).

More than half of respondents had changed their eating habits in the last 5 years (56%, n=59) (Tables 4 and 5). Almost half of those that had changed, had reduced their consumption of meat (44% n=24). Other changes included, eating less fat/fatty foods (7% n=4), eating more fruit and vegetables (9% n=5) and becoming a vegetarian/vegan (11% n=6). There were also a few people who increased or started eating meat (9% n=5).

Table 4: Eating habits five years ago

Percentage	never	rarely	approx. once a week	2/3 days a week	most days
beef	15	24	37	23	1
other red meat (e.g. pork or lamb)	15	17	40	24	4
processed meat products (e.g. pies/burgers)	20	39	20	20	1
poultry (e.g. chicken or turkey)	12	3	32	46	7
organic meat	73	20	3	3	1
fish	14	27	43	16	0
fruit and vegetables	2	1	2	12	83
n=105					

Table 5: Current eating habits

Percentage	never	rarely	approx. once a week	2/3 days a week	most days
beef	27	32	32	8	1
other red meat (e.g. pork or lamb)	21	33	27	17	2
processed meat products (e.g. pies/burgers)	24	41	20	15	0
poultry (e.g. chicken or turkey)	13	10	26	44	7
organic meat	68	24	4	4	0
fish	14	33	37	12	4
fruit and vegetables	2	0	3	17	78

Reasons for changes made included: leaving home to go to university (24% n=14), BSE and other health scares (19% n=11), health improvement (17% n=10), fitness and weight loss (10% n=6) and likes and dislikes (10% n=6). Many of the respondents gave secondary or tertiary reasons for changes such as cost, health and leaving home.

Overall, the number of vegetarians/vegans remained stable, but some respondents expressed that they had either become vegetarians (n=7) or started eating meat in the five year period.

4. Discussion

Longer term changes in eating habits due to the BSE crisis have been minor amongst our respondents. Our results have shown that over a third of respondents did stop eating UK beef due to the BSE crisis, but only for a limited period of time. In general beef consumption in the UK has to a large extent returned to pre-BSE crisis levels. Although overall consumption of beef remains lower than before the BSE crisis, consumption of prime cuts is almost back to previous levels. The consumption of mince and exports have not recovered (Maxwell, 1997). In this initial survey, most changes in eating habits were due to change in life circumstances on leaving home to go to university. There was, however, a noticeable desire to change eating habits for health and fitness reasons.

The primary impact of the BSE crisis has been on attitudes to food safety, the process of regulation and information provision. The majority of respondents wanted more information to be provided to the public, but were most concerned that this information is independent and reliable. The Government has lost the trust of the public with regard to food safety, but egalitarian attitudes were generally associated with a trust in experts and policy makers, and doctors and scientists were particularly trusted by most respondents. The mass media as a main source and transmitter of information were also not trusted. This lack of trust in the Government and the media, being main transmitters of information, may have a significant impact on the successful communication of other health risks.

Interestingly, the European Union was still trusted to tell the truth even though the UK Government were not. This may reflect the fact that the EU are not regarded as stakeholders in the UK farming industry. This division is broadly in keeping with a study undertaken by Frewer *et al.*, (1996) before the announcement of a possible link between CJD and BSE.

The UK Government of the 1980s took a laissez-faire approach to the regulation of the food production and agricultural industries. Responsibility was based on co-operation between the Government and the food industry rather than strict legal standards. Due to a lack of trust in Government and industry, an Independent Food Standards Agency may be the solution to the problem as it would appeal to most people, accounting for different world-views, and would be seen to put control in the hands of experts without a direct link to Government or industry. However, freedom of consumer choice, given accurate and reliable information was also seen as very important, and further legislation was not supported.

5. Conclusions

This survey demonstrates that current attitudes to food safety focus on issues of trust, accountability and blame. In the BSE crisis, the Government has particularly been viewed as a culprit, along with the food industry and farmers. Trust has been lost in current regulatory practices, and there is therefore a great deal of support for an independent agency to regulate food standards, which is distinct from industry and government. However, there is also general support for informed consumer choice, rather than paternalistic legislation.

6. Future Research

As this is a pilot study we did not aim to give conclusive results but to test the methodology and to develop an understanding of the relevant issues. In the full study we aim to look at social and geographical (urban - rural) differences in risk perception using a number of food related risks which have attracted media attention. We will use a mixed methodology of questionnaires and focus groups or semi-structured interviews on a sample of the general public.

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