

# Food Scares and Trust: A European Study

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## Abstract

*The complex interactions between the determinants of food purchase under risk are explored using the SPARTA model, based on the theory of planned behaviour, and estimated through a combination of multivariate statistical techniques. The application investigates chicken consumption choices in two scenarios: (a) a 'standard' purchasing situation; and (b) following a hypothetical Salmonella scare. The data are from a nationally representative survey of 2,725 respondents from five European countries: France, Germany, Italy, the Netherlands and the United Kingdom. Results show that the effects and interactions of behavioural determinants vary significantly within Europe. Only in the case of a food scare do risk perceptions and trust come into play. The policy priority should be on building and maintaining trust in food and health authorities and research institutions, while food chain actors could mitigate the consequences of a food scare through public trust. No relationship is found between socio-demographic variables and consumer trust in food safety information.*

**Keywords:** *Chicken; consumer behaviour; food safety information; risk perception; theory of planned behaviour; trust.*

**JEL classifications:** *D81, D83, D12.*

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## 1. Introduction

There is considerable empirical evidence that different consumers respond to food risk communication in different ways. This implies that policy-makers and food firms cannot rely on a single public information strategy for emerging food risks. Furthermore, the impact of food safety information varies significantly according to the sources providing it.

Over recent decades the European market has been hit by multiple food scares which led to the creation of the European Food Safety Authority (EFSA), with responsibility for establishing a rapid alert system and managing communication in the event of a food crisis. A growing body of research investigating the factors that determine consumer response has been developed to provide some scientific basis for the EFSA tasks. However, issues surrounding households' information processing and subsequent food choices in a situation of increased perceived risk – hence increased levels of involvement – are likely to be culturally specific and hence too varied to admit of a common European Union (EU) response.

While no unequivocal evidence is available for determining the role of socio-demographic characteristics in processing food safety information, Frewer *et al.* (1996) clearly suggest that the country effect is important. Furthermore, Europe-wide scares, such as the 1996 bovine spongiform encephalitis (BSE) event, provide evidence of country differences in their responses to the food scare. According to FaoStat data (FAO, 2006), 1997 beef consumption levels in the UK are only 1.7% lower than that in 1995, whereas in Italy per capita consumption fell by 3.9% and in Germany by 7.4%, regardless of the fact that cases of BSE in Italian and German cows were negligible as compared with those in the UK. There is no single explanation for these cross-country differences. Media communications were different in each country; for example, while in most European countries the focus was on the animal disease, the German media put more emphasis on the potential links between BSE and the related human variant, Creutzfeldt-Jakob disease. Secondly, social networks and the preferred sources of information differ across EU countries. A third relevant factor which is likely to differ across countries is the level of trust that citizens have in institutions, the media, scientific bodies and other sources of food safety information.

The aim of this study was to explore the complex interactions between the determinants of food purchase under risk, within a cross-cultural EU case study to investigate chicken consumption choices in two scenarios: (a) a 'standard' purchasing situation; and (b) purchasing following a hypothetical *Salmonella* scare. A survey was conducted across five European countries, France, Germany, Italy, the Netherlands and the United Kingdom. The choice of chicken as the target product was based on the following arguments: (a) it is widely consumed across Europe; (b) it is subject to a number of potential hazards; (c) at the time of the survey (May 2004) it was not subject to any particular media attention, which could bias the survey response. While the dioxin crisis in Belgium in 1999<sup>2</sup> and the major avian influenza news in 2005 (preceded by other smaller scale flu scares in previous years) have raised consumer concerns for poultry safety, risk perception is relatively low

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<sup>2</sup>See Verbeke (2001) for an extensive discussion of the dioxin crisis and its impact on meat consumption behaviour.

compared with other foods and red meat, as confirmed by the survey outcomes. However, some of the specificities of poultry products need to be taken into account. Consumers perceive microbiological risks like *Salmonella* as the most relevant (Yeung and Morris, 2001). These risks, including avian flu, allow for consumer counteraction, like cooking poultry, while other risks, such as BSE in beef, can be only avoided by not eating certain cuts of beef. With this limitation in mind, the present study explores chicken-purchasing behaviour in relation to perceived risk and trust in food safety communication.

The study should contribute to the policy debate on how to target consumers with accurate and relevant food safety information through examining whether: (a) social networks are equally important sources of information across EU countries; (b) the level of trust that citizens have in institutions, the media, scientific bodies and other sources of food safety information differs across countries; and (c) consumers can be segmented and targeted according to demographic characteristics. The results presented here are a synthesis from a wider European Project, details of which can be found elsewhere.<sup>3</sup>

## 2. Research Background and Theoretical Framework

With an increasing awareness of food safety issues by the general public, evaluating the perceived risks associated with food purchasing and consumption is important for the provision of effective policy communication in this area. There is a growing and varied body of economic analysis of food safety issues, with respect to risk and trust (for a detailed review, see Lobb, 2005).

In this paper, we focus on consumers' difficulties in assessing risks related to food hazards and their associated dependence on social and political sources to provide appropriate information. The model introduced in this paper is based on the theory of planned behaviour (TPB) (Ajzen, 1985, 1991), a successful analytical tool for a range of behaviours, often associated with risky or health-related actions such as smoking, risky driving, physical activities and exercise, or contraception (see Conner *et al.*, 2003 for an extensive list of applications). The TPB framework has also been applied to food choices, e.g. Cook *et al.* (2002) investigate consumer attitudes to genetically modified (GM) foods, whereas Dennison and Shepherd (1995) explore adolescent food choice. In another study which looks closely at the impact of information on consumer choice, McEachern and Schröder (2004) investigate the effects of value-based meat labelling on purchasing intentions. The implications of applying the TPB model to different countries are discussed in Kalafatis *et al.* (1999), who analyse the intentions of purchasing environmentally friendly products in the UK and Greece and find that their determinants have different weights in the two countries.

The TPB framework, developed from the theory of reasoned action (TRA) (Ajzen and Fishbein, 1980), defines human action as a combination of three dimensions: behavioural beliefs, normative beliefs and control beliefs. Behavioural beliefs (i.e. beliefs about the outcome of the action) produce either a positive or a negative

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<sup>3</sup> See reports on the trust website (<http://www.trust.unifi.it>) and UK-specific findings in Lobb *et al.* (2007). A detailed account of all project results relating to the SPARTA model is also available from the authors on request.

attitude towards behaviour; normative beliefs refer to subjective norms or perceived social forces (expectations of family members, colleagues and friends, doctors, religious organisations, etc.); and control beliefs lead to perceived behavioural control (availability, price, etc.). All these produce intentions to behave (Ajzen, 2002), a pre-determinant of behaviour.

Although the TPB has been satisfactorily applied to many areas, there are a number of issues that have been the subject of investigation. The first is that the TPB predicts intentions to behave rather than behaviour. Armitage and Conner (2001) review 185 studies and show that TPB models accounted for 39% of the variance in intentions, but 27% in behaviours. They also argue that the subjective norm (SN) construct is generally a weak predictor of intention, both because of poor measurement and the limiting definition of SN. Other issues include self-report biases and social desirability, the definition of perceived behavioural control (external vs internal control factor, or self-efficacy) and the way intentions are measured (as intentions, desire or self-predictions). Other recent studies have criticised both the theoretical and empirical validity of this TPB model. On a theoretical level, Aarts and Dijksterhuis (2000) and Verplanken *et al.* (1998) suggest that established habits may be more important in explaining behaviour than the TPB constructs. On the empirical front, Droomers *et al.* (2004) note that there is little or no link between intentions and actual behaviour when examining behaviour related to the cessation of smoking.

This study addresses some of these issues by extending the concept of the TPB, by noting that risk perception and trust are behavioural determinants whose nature is jointly relevant to the TPB concepts of attitudes, subjective norm and behavioural control. Integrating risk perception and trust into the TPB framework and considering the influence of different individual (or household) characteristics lead to the development of the SPARTA model. The acronym SPARTA is derived from the initials of the global variables used to explain behavioural intentions: subjective norm (S), perceived behavioural control (P), attitudes (A), risk perception (R), trust (T) and *alia*<sup>4</sup>, (A). The interaction between these components is illustrated in Figure 1.

### 3. Methodology

#### 3.1. Survey design

The questionnaire was based on the SPARTA model specification and was designed following a set of four focus groups in each of five countries. The back-translation method ensured minimal variance of meaning in questions across countries. Following a pilot study in each country in March 2004 ( $n = 126$  in total), the questionnaire was revised to account for ambiguous wording.

The behaviour of interest is purchasing fresh or frozen chicken in the week following the interview. As the survey does not allow a check on actual behaviour, the intention to do so was measured on a seven-point Likert scale, from extremely unlikely (1) to extremely likely (7). A second behavioural intention was included in the questionnaire to check for the impact of a food scare. The respondents were

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<sup>4</sup>The term '*Alia*' is taken from the Latin meaning 'other things' – here referring to all other determinants, e.g. socio-demographic variables and cultural (country-specific) characteristics.

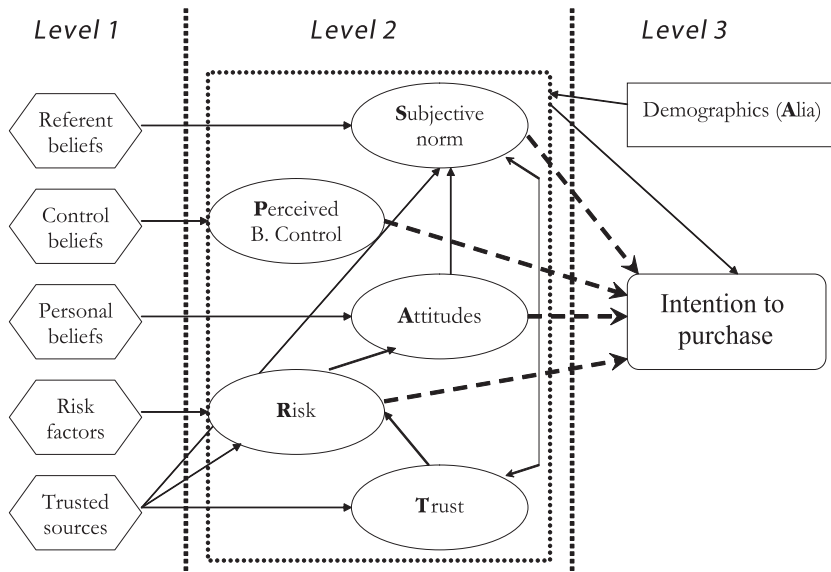


Figure 1. The SPARTA modelling approach

asked to state their purchasing intentions (again on a seven-point Likert scale), assuming that they had just discovered, by reading an article in a newspaper, that high rates of *Salmonella* in chicken had been found in their area, leading to the hospitalisation of several people.

The questionnaire was built following the target, action, context, time (TACT) guidelines for the TPB, discussed in Ajzen (2002). Global variables such as attitudes, subjective norm and perceived behavioural control were elicited (a) directly through a seven-point Likert scale anchored at the end-points with corresponding statements and, (b) indirectly through a set of specific questions to identify their sub-determinants. The expectancy–value (E-V) formulation (Fishbein and Ajzen, 1976) was adopted for obtaining indirect estimates.

The direct measurement of the attitude component was based on a generic seven-point Likert scale (Personally, I think that buying chicken for my household is good/bad). Outcome evaluations were measured on a set of 11 beliefs, by asking on a seven-point scale how much the respondent agrees that the decision to buy chicken in the week following the interview will be based on an evaluation of: (a) taste; (b) value for money; (c) ease of preparation; (d) safety; (e) chicken being liked by everyone in the household; (f) potential for variety in cooking; (g) fat content; (h) cholesterol content; (i) local community livelihood; (j) ethical food production methods; (k) animal welfare. For the same items, belief strengths were measured (In general, how important are each of the following to your household?) In normal circumstances, consumers take into account only a small number of product characteristics in choosing food products (East, 1997). In order to evaluate this saliency issue (Ajzen and Fishbein, 1980), each respondent was asked to select a maximum of three beliefs which s/he regarded as influential when purchasing chicken. Two different indirect measures were produced, one based only on the salient beliefs and one on all items.

Direct measurement for the subjective norm was obtained by asking about the importance of others' opinions about buying chicken. In the pilot survey study, the E-V formulation for the subjective norm was structured into three reference groups (relatives, friends and colleagues). However, the pilot study showed that it was often difficult for the respondent to single out the opinions of these referents regarding the purchase of chicken, so it was decided to include a single two-pronged question to elicit subjective norm indirectly. Referent beliefs were measured on a seven-point scale by asking 'Other people suggest chicken in the diet is very bad/very good', whereas a motivation to comply measure was given by the agreement with the statement 'I take others' opinions into account when making decisions about whether or not to buy chicken', again on a seven-point scale.

Perceived behavioural control posed several measurement problems, as there are not many control factors in relation to buying chicken. Elicitation of the salient control factors was based on focus groups and outcomes from the pilot study. Two items emerged as being highly correlated with the direct behavioural control question, first on freezer storage (if chicken is already in the freezer this could prevent the respondent from buying more), and the other on the possibility that the overall inclination to buy could be offset by an abundant consumption in the survey week. Another widely debated issue concerns the concept of 'self-efficacy', i.e. the assessment of internal control factors and whether or not they correspond to perceived behavioural control (often identified with external control factors). This aspect is discussed in relation to food choice by Sparks *et al.* (1997) and Povey *et al.* (2000). In our study, where the action of interest is purchasing the 'standard' chicken (with no reference to its safety level), this distinction appeared to be irrelevant during our preliminary qualitative research. Nevertheless, we exploited two-pronged questions as suggested by Ajzen (2002), where control belief strengths are moderated by control belief power.

Questions measuring perceived risk were adaptations of previously used questions (e.g. Slovic, 1992), again posed as seven-point Likert scales. The indirect measure of risk perception was computed as a weighted average of perception of individual risk factors and stated knowledge of the risk factors. An evaluation of risk factors was requested for both short-term health consequences (*Esherichia coli*, *Salmonella*, *Listeria*, allergy from food additives) and long-term risk factors (cholesterol, health problems from pesticides, health problems from antibiotics, health problems from growth hormones, chicken flu).

The trust questions were measured as seven-point Likert scales based on a set of 23 food safety information sources (based on Frewer *et al.*, 1996), in relation to communication on the risks of *Salmonella* in food. In our survey, the focus is on trust in the information source rather than trust in chicken. Other studies look specifically into the role of trust in foods,<sup>5</sup> whereas – as discussed above – in this study an individual belief on the perceived safety of chicken is embedded in the measurement of attitude.

The level of confidence in the information provided by different sources was measured by the following question: 'Suppose that each of the following has provided information about potential risks associated with *Salmonella* in food. Please indicate

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<sup>5</sup>See Poppe and Kjaernes (2003), Berg (2004) and research findings from the *Trust-in-food* research project (<http://www.trustinfood.org>).

Table 1  
Sample mean values and Pearson's correlations between expectancy-value and direct measures of global variables

	Variable	Mean indirect measure	Mean direct measure	Correlation direct-indirect
S	Subjective norm	3.33 (1.37)	2.81 (1.85)	0.67***
P	Perceived behavioural control	3.76 (1.15)	2.40 (1.59)	0.42***
A	Attitude – all beliefs	5.42 (0.68)	5.74 (1.50)	0.54***
A	Attitude – salient beliefs	5.94 (0.97)	5.74 (1.50)	0.57***
R	Risk perception	2.60 (1.43)	2.85 (1.38)	0.28***

*Notes:* S, P, A, R and T are expressed in a 1–7 scale sorted in terms of relevance; the trust component scores are standardised to have 0 mean and unity variance across the sample.

\*\*\*Significant at the 1% level.

Standard deviations in parentheses.

to what extent you would trust that information' and the answer was measured on a seven-point Likert scale from 'completely distrust' to 'completely trust', where '4' is the neutrality point and explicit non-responses were allowed.

Standard reliability measures such as the Cronbach's alpha cannot be used within an E-V formulation, as no assumption is made about internal consistency of beliefs (Ajzen, 2002). Indeed, one advantage of the E-V formulation is that it allows for ambivalence on the single beliefs. Thus, a consistency evaluation needs to be based on correlations between the indirect (E-V) measure and the direct measure. Table 1 shows the sample mean values for the direct and indirect E-V measurements and their bivariate correlations across the sample. The trust determinant is discussed more in detail in the *Results* section, but the Cronbach's alpha for the trust questions was very high (0.91), indicating that trust in food safety information as a latent construct was consistently measured by these multiple items.

An acceptable consistency emerges for the other determinants, with similar average values and significant correlations between the E-V measures of the global variables and the direct ones, with the highest correlation for subjective norm (0.67) and the lowest for risk (0.28). Ajzen (1991) reports several examples and finds correlation values between 0.24 and 0.70, indicating an acceptable performance for the present survey. The saliency issue for the attitude variable seems marginal, with a slight increase in correlation when only the most important attributes are considered, although different selection of salient beliefs leads to extremely similar mean values.

### 3.2. Population and sampling

A nationally representative survey based on probabilistic area sampling was conducted in five countries (UK, Italy, Germany, the Netherlands and France) in May 2004 on a total of 2,725 respondents via face-to-face, in-home interviews. Between 451 (Dutch) and 622 (French) consumers were interviewed in each country, depending on country size. The sampling method was random location sampling, which provides a country-representative subdivision into locations; the locations are selected randomly across potential locations to give national representativeness (i.e. probability of extraction proportional to population). The sampling unit was

the household and the respondent was the person responsible for the actual purchase of food. The questionnaire took approximately 30 minutes to complete with 'prompts' on certain questions from the interviewer when required by the respondent. Data were subject to a 10% validation.

### 3.3. Data analysis

Applied studies based on the TPB have used a variety of methods for estimating the relationship between behavioural intention and its determinants. Although TPB analysis has initially been based on multiple regression models (Povey *et al.*, 2000; Tonglet, 2001; Shaw and Shiu, 2002), more recently an increasing number of articles (e.g. Kalafatis *et al.*, 1999; Conner *et al.*, 2003) have relied on structural equation modelling (SEM), or tobit regression when the data are censored (Lynne *et al.*, 1995). Cook *et al.* (2002) base their estimation of a TPB model on an ordered discrete-choice model.

In this study (following from Cook *et al.*, 2002), an ordered probit model is employed.<sup>6</sup> The ordered probit model belongs to the class of discrete-choice probability models widely used in the analysis of attitudes, behaviours and choices and the likelihood of their occurrence. We chose this estimation method for three reasons: (a) in our survey behavioural intentions are measured with a discrete seven-point Likert scale, which suggests avoiding standard multiple regression because of the discrete, nominal, ordered and non-continuous nature of the dependent variable (Liao, 1994); (b) the standard SEM (as implemented by commercially available software) also assumes a continuous and normally distributed dependent variable; (c) SEM estimates are based on the covariance (correlation) matrix only, so that their efficiency is not affected by sample size. Maximum likelihood estimates for the ordered probit model are more efficient for larger sample sizes, as is the case in our study.

Prior to estimating the SPARTA relationships using the ordered probit model, two important preliminaries are necessary: (1) global variables (S, P, A, R, T) are related to their specific determinants (beliefs, risk factors and trust in sources of information); (2) the level of interaction between the global variables is quantified. The statistical methods employed within the overall SPARTA modelling strategy are simultaneous equations modelling and principal component analysis (PCA). A simultaneous equations model is employed in the second level of the analysis, because endogeneity (feedback) among the dependent variables is recognised. A consistent and asymptotically efficient estimate for the coefficients in this model is provided by three-stage least squares (3SLS). The model satisfies the order and rank conditions that ensure proper identification. PCA (see, e.g. Duntemann, 1989) is needed for obtaining the latent determinants of trust as discussed in the *Results* section.

## 4. Results

### 4.1. Trust – a principal components and cluster analysis approach

Table 2 reports the mean values of the trust measures by country. Measuring hypothetical information means that few assumptions can be made relating to the

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<sup>6</sup>The ordered probit model is estimated by the (Broyden–Fletcher–Goldfarb–Shannon BFGS) maximum likelihood algorithm in the LimDep package.



Table 2  
Trust in food safety information (mean score, 4 = neutral)

Source	Country					Total
	UK	Italy	Germany	the Netherlands	France	
Doctors/health authority	6.24	5.91	5.98	6.08	5.78	5.99
National authority in charge of food safety	5.80	5.60	5.98	6.01	5.62	5.79
University scientists	5.53	5.92	5.77	6.04	5.58	5.77
Consumer organisations	5.22	5.58	6.02	5.72	5.91	5.69
Organic shop	5.27	5.08	5.27	5.14	5.30	5.21
European Union authority in charge of food safety	4.62	5.52	5.54	5.41	4.97	5.21
Television news/current affairs	5.17	5.15	5.55	5.39	4.79	5.19
Product label	4.81	5.19	4.48	5.01	5.50	5.03
Specialty store	5.12	4.05	4.91	5.28	5.70	5.01
Television documentary	4.96	4.84	5.26	5.05	4.87	4.98
Radio	4.86	4.56	5.35	5.00	5.13	4.97
Farmers/breeders	5.07	4.67	4.90	4.56	5.56	4.97
Newspapers	4.53	4.87	5.33	4.97	5.01	4.94
Average	4.89	4.78	5.03	4.93	4.80	4.88
Environmental organisations	4.86	4.78	5.41	4.51	4.84	4.86
Animal welfare organisations	4.50	4.69	5.34	4.40	4.67	4.70
Shopkeepers	4.64	4.72	4.48	4.54	5.01	4.69
Supermarkets	4.99	4.73	4.54	4.49	4.48	4.64
Internet	4.54	4.34	4.77	4.82	4.25	4.54
Government	4.39	4.29	4.67	5.36	3.90	4.50
Magazines	4.55	4.28	4.81	4.39	4.48	4.49
Processors	3.95	4.01	3.90	3.97	3.00	3.74
Political groups	3.55	3.33	4.04	3.98	2.89	3.52
Television adverts	4.18	3.56	3.25	3.04	2.95	3.38

content of that information, and as a result it is assumed that there is direct association between the source and the content of the information that a consumer would receive. For example, consumer and environmental groups are a probable source of safety warnings (i.e. negative information), the National Food Standards Agency and University scientists could be assumed to be objective and provide both positive and negative information, whereas food producers, having a vested interest, concentrate on positive messages about the safety of food. These assumptions are corroborated by the results of the cluster analysis and the behavioural relationship with trust.

The level of trust in information is generally high (see Table 2), above the neutrality threshold for all but a few sources, namely processors (especially in France), television adverts (Italy and the UK) and political groups (France especially, also the Netherlands). On average, doctors and health authorities are the most trusted sources of information (5.99), although Germany and France show the highest degree of confidence in consumer organisations.

Principal component analysis suggests that there are five latent trust components, i.e. sources which tend to attract a similar level of trust (or distrust) across respondents. The rotated component matrix for these five components, all with

Table 3  
Principal components loadings for trust in food safety information

Information source	T1	T2	T3	T4	T5
Shopkeepers	0.12	<b>0.81</b>	0.11	-0.05	0.15
Supermarkets	0.17	<b>0.74</b>	0.17	-0.06	0.31
Organic shop	0.11	<b>0.68</b>	0.10	<b>0.40</b>	-0.05
Specialty store	0.20	<b>0.74</b>	0.08	0.25	0.03
Farmers/breeders	0.10	<b>0.73</b>	0.11	0.11	0.07
Processors	0.11	<b>0.47</b>	0.18	-0.04	<b>0.59</b>
Doctors/health authority	0.18	0.23	<b>0.76</b>	-0.01	0.04
University scientists	0.18	0.13	<b>0.72</b>	0.10	0.07
National Food Authority	0.14	0.16	<b>0.79</b>	0.12	0.21
Government	0.21	0.06	<b>0.50</b>	0.10	<b>0.64</b>
Political groups	0.28	0.09	0.19	0.28	<b>0.74</b>
Environmental organisations	0.21	0.13	0.18	<b>0.83</b>	0.15
Animal welfare organisations	0.18	0.12	0.10	<b>0.84</b>	0.16
Consumer organisations	0.30	0.11	<b>0.52</b>	<b>0.51</b>	-0.09
European Food Safety Authority	0.26	0.05	<b>0.62</b>	0.23	0.24
Television documentary	<b>0.67</b>	0.12	0.22	0.13	0.10
Television news/current affairs	<b>0.73</b>	0.15	0.30	0.03	0.10
Television adverts	<b>0.40</b>	0.23	-0.02	0.06	<b>0.60</b>
Newspapers	<b>0.75</b>	0.15	0.16	0.13	0.13
Internet	<b>0.63</b>	0.04	0.13	0.17	0.25
Radio	<b>0.79</b>	0.16	0.18	0.15	0.07
Magazines	<b>0.71</b>	0.23	0.05	0.15	0.25
Product label	0.35	<b>0.43</b>	0.18	-0.03	0.12
Component label	Media	Food chain	Expert	Organisations	Other

*Notes:* Varimax rotation. Values equal to or greater than 0.40 in bold.

eigenvalues larger than 1, are shown in Table 3. Interestingly, all mass media sources group together in the first component, whereas in the second component all food chain actors and product labels are found. The third component emphasises those sources that are expected to provide more technical and independent information. Governments and consumer organisations are also relevant to this component, although with a lesser weight compared with other authorities and scientists. The fourth component includes consumer organisations as well as animal welfare and environmental groups, and organic shops to a lesser extent. These groups may be thought of as 'alternative' sources of information. The fifth component is mixed and includes processors, governments, political groups and television advertisements.

A K-means cluster analysis (CA) on the principal component scores is deployed to identify homogeneous groups of consumers with respect to the level of trust in these sources. The number of clusters was previously identified by applying hierarchical (Ward) and non-parametric (density) methods and testing different partitions on the basis of the pseudo- $t^2$  and pseudo  $F$  statistics and the cubic clustering criterion.

Table 4 reports the three identified clusters, together with some descriptive statistics for the socio-demographic variables and the distribution across the three clusters for each country. As the principal component scores are standardised, a

Table 4  
Cluster of sampled units according to their level of trust in food safety information

	Trusters	Non-trusters	Mixed trusters	Total
Trust in information sources				
Mass media	0.00	-0.36	0.30	0.00
Food chain	0.60	-0.06	-0.83	0.00
Experts	0.33	-1.26	0.58	0.00
Alternative sources	0.32	-0.22	-0.28	0.00
Other sources	0.36	-0.14	-0.41	0.00
Average trust	5.46	4.04	4.64	4.85
Socio-demographics				
Average age	42.71	44.43	41.88	42.90
Median income (€)	30k-50k	30k-50k	30k-50k	30k-50k
Median food expenditure (€)	75-120	75-120	75-120	75-120
Households with children below 16	38%	38%	37%	38%
Median education level	Higher sec.	Higher sec.	Higher sec.	Higher sec.
Median town size	< 10,000 inhab	< 10,000 inhab	< 10,000 inhab	< 10,000 inhab
Distribution by country (%)				
UK	47.8	33.3	18.8	100.0
Italy	42.1	29.9	28.0	100.0
Germany	43.2	20.6	36.2	100.0
the Netherlands	44.1	15.3	40.6	100.0
France	45.9	29.2	24.9	100.0
Total	44.4	25.6	30.0	100.0

positive value implies a degree of trust above the sample average. The first group, 'trusters', includes those more inclined to trust virtually everybody, as shown by an average value of 5.64 for the aggregated trust index. Members of this group have a level of trust above the average for all groups of sources with the exception of mass media, which is exactly at the sample mean level. Trust in this cluster is especially high for information provided by food chain actors. It is also notable that the proportion of the sample falling in this cluster is very similar over all countries studied here, at around 45%. The second cluster is labelled 'distrusters', even though the average level of trust is at the neutrality level (4.04). On average, members of this group show a much lower level of trust towards information provided by experts and scores are below the average for all sources. Here, the British and French are identified as being less trusting than the Dutch. In contrast, the final 'mixed trusters' cluster is more prominent in the Netherlands than in Britain or France. Respondents in this group tend to trust the food chain actors less but they do trust mass media and specifically experts at a level above the sample average.

Using these trust clusters, one result is particularly striking: the three clusters are practically identical in terms of demographic characteristics. In other words, no links emerge between the level of trust in food safety information and socio-demographic variables. Rather, the country (or culture) appears to be more relevant to trust clustering. The UK has the highest percentage of trusters and distrusters and the lowest of mixed trusters. The distrusters group is also well represented in Italy

and France, and Italy has also the lowest portion of trusters. Germany and the Netherlands have high percentages of mixed trusters.

#### 4.2. The global SPARTA determinants

To estimate the SPARTA model illustrated in Figure 1, a first step is to compute the values of the variables from the questionnaire items. The average values for the variables are shown in Table 5. These variables were built by aggregating the questionnaire items according to the E-V formulation by Fishbein and Ajzen (1976).

It is worth noting the characteristics of the overall sample and some country specificities. All country differences are significant at the 1% level. The TPB determinants and the purchasing intentions are measured on a 1–7 scale, 4 being the neutrality point. Results show that the average respondent has a high likelihood of purchasing chicken in the week following the interview (especially in the UK, less in France) and that the attitude towards buying chicken is very positive (with the highest value again in the UK). The subjective norm is below neutrality (most people do not rely on others' opinions in making their choices), especially in the Netherlands and in France. Perceived control on behaviour is also neutral on average, while risk perception is low.

Using the latent trust components measured through standardised principal components scores, as previously discussed, a positive value indicates trust above the

Table 5  
Average values of variables in the SPARTA model

	Country					All sample	<i>F</i> -value <sup>a</sup>
	UK	Italy	Germany	the Netherlands	France		
Behavioural determinants							
Subjective norm	3.85	3.66	3.54	2.62	3.01	3.33	82.29**
Perceived behavioural control	4.08	3.51	3.69	4.41	3.22	3.76	108.21**
Attitude	6.14	6.06	5.60	5.82	6.00	5.94	25.52**
Risk perception	1.88	2.62	3.48	2.77	2.36	2.60	85.33**
Average trust	4.89	4.78	5.03	4.93	4.80	4.88	6.49**
Trust in information provided by different sources							
Media	-0.11	-0.17	0.23	0.02	0.04	0.00	10.33**
Food chain	0.19	-0.08	-0.19	-0.18	0.35	0.00	22.12**
Experts	-0.22	0.04	0.03	0.26	-0.17	0.00	13.57**
Organisations	-0.15	-0.16	0.37	-0.23	0.14	0.00	28.04**
Other	0.21	0.12	0.03	0.17	-0.60	0.00	42.78**
Behavioural intentions							
Standard purchase intention	5.57	5.00	4.85	4.94	4.49	4.97	23.55**
Purchase intention after <i>Salmonella</i> scare	3.41	2.53	2.88	2.87	2.80	2.89	14.09**
% change (average)	-22.52	-40.89	-30.48	-11.69	-5.53	-21.58	11.40**

Notes: <sup>a</sup>One-way ANOVA test on country differences.

\*\*Significant at the 1% level.

sample average. This means that average trust in mass media is higher in Germany and lower in Italy, while food chain actors are especially trusted in France and the UK. These two countries have less trust than others in experts' opinions on food safety (including governments). Consumer, animal welfare and environmental organisations are especially trusted in Germany and France, less in other countries, while France has a much lower confidence in information provided by those with a potential vested interest, i.e. processors and adverts, political parties, etc. Finally, it is interesting to note (Table 4) that the impact of a (potential) *Salmonella* scare is particularly severe in Italy (where intentions to purchase fall by 41%) and Germany (−30%). This result is consistent with the reaction to beef purchases in these countries after the BSE news, compared with the rest of Europe.

#### 4.3. The interaction among determinants: SPARTA

Table 6 shows the results of estimating a simultaneous equation system within the SPARTA modelling framework for each of the three clusters – non-trusters, mixed trusters and trusters. This allows evaluation of the strength and direction of the interactions between the behavioural determinants. To avoid the risk of over-fitting the data, the number and nature of the interactions illustrated in Figure 1 are specified to meet the identification conditions. This implies some necessary restrictions on the directions of the causal links, for example trust in food safety information is assumed to influence risk perception without feedback effects or direct influence on attitudes. The results reported in Table 6 highlight some relevant relationships, with the *R*-square value for the overall model ranging between 0.20 and 0.27. The estimated values represent coefficients for each of the right-hand-side variables listed in the first column. Each of the equations has a country-specific intercept, while only those socio-demographic variables significant at the 10% significance level were retained in the final model. Country-specific dummies reflect country differences in the dependent variable, all other factors being equal. Trust variables are those summarised in Table 5 and obtained through PCA, so they are continuous variables with mean of zero and a unity variance, across the whole sample. Thus, their coefficients can be compared both across columns and across rows and represent the effect of trust in information provided by different sources on the dependent variable. Finally, age, income and town size are categorical variables, while kids is a dummy variable which is 1 if the household has children and 0 otherwise.

For each equation, country-specific intercepts show the average level for the dependent variable in each country after accounting for other explanatory variables. To avoid the dummy variable trap, only country dummies and no intercept terms appear in the equation. This transforms the dummy coefficients into country-specific intercepts. The coefficients of other right-hand-side variables reflect changes in the dependent variable associated with a unitary increase in each of the explanatory variables. The subjective norm, i.e. the relevance of referent beliefs towards purchasing chicken, is positively influenced by trust in food safety information from all sources. This means that those who have a higher degree of confidence in information provided by external sources also rely on their referent beliefs more than others, although – as shown later in the paper – referent beliefs seem to have little impact on the formation of intention. The positive effect of trust in food safety information is higher for mixed trusters and trusters when compared with non-trusters. In other words, the effects of trusting information towards purchasing are

Table 6  
Interaction among global variables (simultaneous equation system)

	Non-trusters	Mixed trust	Trusters
<i>R</i> -square	0.23	0.27	0.20
	<b>Equation</b>		
<b>Right-hand-side variable</b>	<i>Subjective norm</i>		
UK	4.15**	3.95**	3.78**
Italy	3.88**	3.80**	3.43**
Germany	4.01**	3.36**	3.25**
the Netherlands	2.52**	3.01**	2.57**
France	3.08**	3.61**	2.95**
Trust in media information	0.29**	0.48**	0.39**
Trust in food chain information	0.27*	0.43**	
Trust in expert information	0.26*	0.48**	
Trust in information from organisations	0.17*	0.47**	0.30**
Trust in other information	0.26*	0.42**	0.41**
Town	0.24*		
	<i>Attitudes</i>		
UK	6.45**	6.55**	6.43**
Italy	6.51**	6.91**	6.56**
Germany	5.89**	6.22**	6.20**
the Netherlands	6.18**	6.50**	6.12**
France	6.11**	6.46**	6.51**
Risk perception	-0.20**	-0.19**	-0.08
Age	-0.11*		
Income			0.05
Town		-0.14	-0.19*
Kids	0.30		
	<i>Risk perception</i>		
UK	1.95**	1.99**	2.07**
Italy	3.61**	2.98**	2.30**
Germany	3.30**	3.62**	3.47**
the Netherlands	2.89**	2.79**	2.67**
France	2.33**	2.68**	2.46**
Trust in food chain information	-0.33*		-0.35**
Trust in expert information		-0.22*	-0.20
Trust in information from organisations	0.17*		0.14
Trust in other information	-0.20*		
	<i>Average trust</i>		
UK	-0.80**	-0.75**	-0.17*
Italy	-0.86**	-0.72**	-0.08
Germany	-0.66**	-0.64**	-0.05
the Netherlands	-0.68**	-0.69**	-0.10
France	-0.72**	-0.83**	-0.08
SN	0.14**	-0.18**	0.13**
Town			-0.03
Age	-0.06*		

*Notes:*\*\*Significant at the 1% level; \*significant at the 5% level.

amplified through the subjective norm. For equal levels of trust and for all clusters, the subjective norm is highest in the UK and lowest in the Netherlands. Trust in information provided by mass media has a larger impact in enhancing the positive effect of the subjective norm when compared with other communication means.

Considering the intercepts of the attitude equation, the average values after accounting for differences in terms of risk perception and demographic variables, range between 5.89 (German non-trusters) and 6.91 (Italian mixed trusters). This means that, *ceteris paribus*, Italian mixed trusters have a stronger attitude towards purchasing chicken than German non-trusters, although all values are quite high considering the 1–7 Likert scale of the dependent variable. Furthermore, attitudes are negatively related to risk perception, as expected, but the negative influence of risk perception is weaker for trusters. More specifically, a coefficient of  $-0.20$  (for trusters) means that for each additional level of risk perception, attitudes towards purchasing chicken fall by 0.2 points on the 1–7 Likert scale. Demographics do not prove to be very important, although the presence of children in the household strengthens attitudes towards chicken for those classified as non-trusters, while larger town sizes are associated with weaker attitudes for trusters.

Risk perception is generally low (Table 5), although there seem to be relevant country differences. *Ceteris paribus*, Germans have a higher risk perception, together with Italian non-trusters and mixed trusters, while the UK has the lowest risk perception among these countries. An interesting relationship emerges when examining risk perception and the influence of trust in food safety information. There is a negative association between risk perception and trust in information provided by the food chain for non-trusters and trusters, though trust in information provided by experts significantly decreases risk perception, except for the non-truster cluster. This is discussed in more detail below, in relation to the effects of enhancing trust on behavioural intentions.

The trust equation (where the dependent variable is standardised to have mean 0) shows negligible differences in trust across countries after accounting for subjective norm as an additional explanatory factor. Given the segmentation strategy, non-trusters have obviously the lowest intercepts. Among these, Italians have the lowest level of relative trust and Germans the highest. It is interesting to note that a positive relationship between trust and subjective norm emerges for non-trusters and trusters, while mixed trusters are characterised by a negative relation. This may suggest that for mixed trusters influential opinions from referents tend to substitute reliance on external sources. Trust seems to (slightly) decrease with age for non-trusters, though demographics are hardly relevant across the clusters. This confirms the previous finding that trusting food safety information is unrelated to socio-demographic characteristics.

#### 4.4. The ordered probit model – an examination of intentions to purchase

The final phase of analysis consists of estimating the ordered probit equations relating purchasing intentions to the SPARTA model determinants. The model was estimated separately for the three clusters of respondents, previously identified, allowing for a country-specific intercept. Both behaviours of interest were investigated: the standard likelihood of purchase and the likelihood of purchase conditional on news about a *Salmonella* incident. Results are shown in Table 7.

Table 7  
Determinants of purchasing intentions by aggregate trust segments

Determinants	Standard situation			<i>Salmonella</i> scare		
	Non-trusters	Mixed trusters	Trusters	Non-trusters	Mixed trusters	Trusters
C UK	-0.97**	-0.39	-0.78	-1.08**	-0.32	-0.37
Italy	-1.22**	-0.97*	-1.16**	-1.49**	-1.03*	-0.67
Germany	-1.40**	-0.86	-1.15**	-1.16**	-0.61	-0.30
the Netherlands	-1.36**	-0.71	-0.89*	-1.20**	-0.36	-0.61
France	-1.46**	-0.97*	-1.47**	-1.14**	-0.85*	-0.66
S Subjective norm	0.02	0.03	0.02	0.09**	-0.01	0.02
P Perceived behavioural control	0.11**	0.07	0.07	0.11**	-0.02	-0.03
A Attitude	0.36**	0.32**	0.40**	0.13**	0.20**	0.20**
R Risk perception	-0.01	0.06	0.00	-0.03	-0.09*	-0.12**
Chi-square	142.45**	45.30**	94.71**	67.42**	54.49**	51.39**
Correct predictions	0.32	0.27	0.33	0.43	0.44	0.36
Correct predictions (three categories)	0.60	0.59	0.72	0.61	0.66	0.62

Notes:\*\*Significant at the 1% level; \*significant at the 5% level.

In a standard or normal situation, and holding other determinants constant, the intercepts show that non-trusters are the least likely to buy chicken (though not in France, where trusters are just as likely not to purchase), while mixed trusters (i.e. trusting mass media and experts but less the other sources) are more likely than trusters to purchase chicken. All other factors being equal, consumers in the UK are the most likely to purchase chicken, both in normal and food-scare situations. On the other hand, Italians are the least likely to buy chicken in a food-scare scenario. Attitude is the main determinant for all groups and has a stronger effect on trusters. Perceived behavioural control has a lower impact, while subjective norm is not significant in any of the clusters (except among non-trusters in a food-scare situation).

Differences between country-specific intercepts may be quite relevant in some cases. For example, all other factors being equal, the difference in intentions to purchase between UK and French non-truster households in a normal situation is 0.49 (over a seven-point Likert scale), whereas a unit change in attitudes (also measured on a seven-point Likert scale) induces a 0.36 change in intentions to purchase. Translating these values into marginal effects, this implies that the probability of purchasing chicken (i.e. a purchasing intention above 4 on the seven-point Likert scale) is 16.1% higher for British households than for French households, whereas a unit increase in attitudes raises the probability by 13.5%.<sup>7</sup> In most cases the differences in country effects are smaller, but their impact is still comparable with the effect of attitude changes. The influence of each determinant on intentions as captured by the marginal effects is summarised by the table in the *Appendix* for

<sup>7</sup>Tables with marginal effects are omitted here to avoid unnecessary complexity. They are however available on request.



each of the clusters and for both situations, before and after the hypothetical food scare.

Comparing the normal situation with a *Salmonella* food scare, for the group of non-trusters, for example, most of the determinants (including intercepts) do not change noticeably, attitudes lose a major part of their weight, whereas the subjective norm becomes significant and almost as relevant as attitudes. This suggests that in the case of a food scare, non-trusters, who rely on referent beliefs, are less likely to reduce consumption, emphasising the relevance of social networks, specifically for this group. For mixed trusters and trusters, the loss of relevance of attitudes is slightly less prominent, but risk perception has an increased impact. In fact, trusters and mixed trusters are on average less affected by the scare when compared with their non-trusting counterparts, especially if they have positive attitudes. The impact is more relevant for those who declare higher perceived risks even in the standard situation. The fit of the models is acceptable relative to similar studies (with correct predictions varying between 27% and 44%) and becomes relatively good if behaviours are further classified into three categories (unlikely to buy, neutral, likely to buy), reaching values between 59% and 72%.

#### 4.5. The effects of enhancing trust

Table 8 simulates the effects of increasing the level of trust in food safety information in each of the five trust components. The impulse was created by increasing each of the trust components by 20% and following the implications through levels 2 and 3 of the SPARTA model. Responses are measured in percentage terms with respect to the original scale of the variables. The impact of a change in trust levels is negligible in a standard situation, but more substantial and interesting under the occurrence of a *Salmonella* scare, particularly with respect to trust in experts such as national and European food safety organisations and trust in food chain actors. Enhanced trust in experts reduces risk perceptions among mixed trusters and

Table 8  
Impacts of enhancing trust levels on risk perception and intentions to purchase

	Media	Food Chain	Experts	Organisations	Other
Non-trusters					
Risk perception	+0.00	-11.54	-0.00	+5.75	-6.80
<i>Intentions to purchase</i>					
Standard situation	+0.10	+1.49	-0.40	-0.50	+0.89
<i>Salmonella</i> scare	+9.21	+15.36	-6.53	+1.92	+11.71
Mixed trusters					
Risk perception	+0.00	+0.00	-7.87	+0.00	+0.00
<i>Intentions to purchase</i>					
Standard situation	+0.41	+0.30	+2.08	+0.36	+0.25
<i>Salmonella</i> scare	-1.09	-1.09	+5.13	-1.09	-1.09
Trusters					
Risk perception	+0.00	-14.31	-7.79	+0.00	+0.00
<i>Intentions to purchase</i>					
Standard situation	+0.17	+0.34	+0.14	+0.14	+0.17
<i>Salmonella</i> scare	+1.42	+9.11	+4.26	+1.42	+1.54

trustees (about 75% of the population), enhancing intention to purchase by around 5%. Non-trustees react apparently perversely with lower purchase intentions. There are strong incentives for those actors in the food chain to enhance trust, given that non-trustees and trustees alike are much more likely to purchase the product if they trust information from the industry.

## 5. Conclusions

The complexity of factors influencing the way consumers process food safety information makes it difficult to develop adequate risk communication strategies. Given the frequency of food scares, however, this is a priority for current European policy and for the European food chains. This paper tries to answer some key questions: (1) Can the consumers be segmented into socio-demographic groups in relation to their trust in food safety information? (2) Are country and cultural differences relevant for the way food safety information is processed? (3) Do risk perception and trust in food safety information influence food choice in relation to other determinants? (4) Does a food scare alter the weight of these determinants? (5) Do information sources differ in terms of how they impact on consumers' risk perception and behaviours?

The SPARTA model provides some answers to these questions. Although the survey and the questionnaire focus on a single product – chicken – in order to guarantee consistency in consumer responses, we expect that the implications of the results can be extended to other food products and that the SPARTA model is also relevant to non-food products. Furthermore, our findings can be compared with similar studies on the same topic, especially those reported in Poppe and Kjaernes (2003).

The present study is also subject to some limitations,<sup>8</sup> which make the results conditional on the survey settings. First, the format chosen for measuring purchasing intentions after releasing information on a *Salmonella* outbreak is likely to be conditional on the format in which information is released. Second, in response to the information provided the consumer may choose to switch to a different type of chicken, for example quality-assured chicken. This and other averting behaviours are difficult to measure in a hypothetical setting.

A first major result is that no relationship emerges between socio-demographic variables and the trust placed by a consumer in food safety information, which confirms similar results in Poppe and Kjaernes (2003, p. 96). This finding appears to be robust as it manifests in both the segmentation analysis (consumers differing in terms of sources they trust do not show relevant differences in terms of demographics) and the behavioural modelling (few socio-demographic variables are statistically significant and they are not consistent across countries). The major implication is that the impact of food safety information depends on the source and its reliability, rather than the individual socio-demographic characteristics of the consumer processing it. According to these results, it is not possible for policy-makers to target specific socio-economic groups within the community, e.g. single mothers or people from disadvantaged backgrounds. The results suggest the need to understand the psychological characteristics of different segments of consumers and to target them with different communication messages.

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<sup>8</sup> We are grateful to the anonymous reviewers for their insights into the above issues.

Risk perception is directly affected by trust in information provided by the food chain, by experts and by alternative sources such as consumer, environmental and animal welfare organisations. In general, information from experts and food chain actors reduces risk perception, while information provided by alternative sources tends to increase it. This however depends on the (positive or negative) content issued by these sources. Hence, a successful risk communication strategy should start from the consideration that people significantly differ in terms of the sources they trust but that this is unrelated to characteristics such as age, education, income, etc.

On the other hand, the survey results and subsequent modelling efforts place emphasis on the relevant country differences within Europe. Germans place more trust in mass media and alternative sources than other countries, while Italians are the least predisposed to trust these same sources. British people trust the EFSA and other scientists to a lesser extent and the French and British place a higher degree of trust in information provided by food chain actors. Most of these outcomes coincide with the findings reported by Poppe and Kjarnes (2003, p. 91), which include a lower trust in media information for Italian and UK consumers, a higher trust in food authorities for UK consumers and a higher trust in independent organisations for Germans.

However, trust in food safety information does not necessarily influence risk perception in the same direction. According to the SPARTA model, in all countries except Italy, those who trust alternative sources tend to have a higher risk perception. This suggests that risk communication strategies should be country-specific, and should take account of cultural differences rather than socio-economic and demographic characteristics of the households.

Results also show that risk perception is unlikely to affect consumer choices when there is no related food scare, however when there is a food scare, intentions to purchase are affected by differing levels of risk perception. Again, this depends on the trust characteristics of the consumer. Those who have less trust in food safety information, independently of the source, tend to be less sensitive to risk perception and rely more on their social network. Those who are most inclined to trust information from any source are the most sensitive to changing risk perception levels, but those who have a mixed trust attitude also react significantly to changing risk perceptions. These two groups have in common a relatively high level of trust towards experts (e.g. food standard, safety and health authorities, scientists) which gives these sources a key role in communicating risk and suggests that efforts to maintain and build further trust in these sources is a fruitful way of avoiding at least some of the undesirable adverse consequences of a food scare.<sup>9</sup> Interestingly, trust in expert information does not reduce risk perception for people who are classified as non-trusters. Food chain actors, especially processors, are less trusted sources of food safety information; given that they also have most to lose during a food scare and, as shown in Table 8, the greatest potential to offset the adverse consequences of a food scare, they should act logically to enhance trust in themselves as sources of food risk information. This paper does not examine how this could be done, but one could speculate that food chain actors should develop an integrated food chain

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<sup>9</sup> An undesirable adverse consequence occurs when consumers' risk perceptions are out of line with objective risks.

response and reputation for providing honest assessments of risks rather than be tempted to argue that risks during a food scare are minimal.

The methodology adopted in this paper has been firmly embedded in the overlapping disciplines of consumer science, psychology and market research. From a more mainstream agricultural economics perspective, the results of the paper suggest some relevant research directions: studies of the demand for food often use demographic variables as demand shifters, whereas this study suggests that they are unlikely to play an important role; studies of demand response to a food scare often use a 'media stories' variable based on a count of articles as a demand shifter, but the source of the message is likely to be as important as the messenger – the message, even if published by the same newspaper, is likely to have a different impact if the original source is an independent medical report from respected scientists than a food industry study. More sophisticated constructs of media counts variables that take account of the source of the story would be sensible. Finally we suggest that *ex ante* analyses of government interventions aimed at information provision on food risks should consider that their probable ineffectiveness in 'normal' circumstances does not mean that they would be ineffective during a food scare when consumers are much more responsive to information on food risks.

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## Appendix

The following tables summarise the effects of the global determinant on intentions to purchase (SPARTA ordered probit equation), for each of the clusters and for both the standard situation and the hypothetical *Salmonella* scare. The values represent the change in the probability of belonging to a given category of the dependent

variable (ITP), (the columns of the tables) induced by a unitary change in the explanatory variables (the rows of the tables).

Table A1

Variable	Intentions to purchase						
	1	2	3	4	5	6	7
Non-trusters, standard situation							
C UK	0.213	0.053	0.043	0.063	-0.013	-0.101	-0.258
Italy	0.294	0.061	0.047	0.054	-0.031	-0.133	-0.293
Germany	0.397	0.059	0.039	0.014	-0.065	-0.165	-0.278
the Netherlands	0.348	0.064	0.047	0.043	-0.044	-0.151	-0.307
France	0.326	0.071	0.057	0.079	-0.020	-0.136	-0.377
S Subjective norm	-0.004	-0.001	-0.001	-0.003	-0.001	0.002	0.008
P Perceived behavioural control	-0.017	-0.006	-0.006	-0.012	-0.003	0.008	0.035
A Attitude	-0.057	-0.020	-0.019	-0.039	-0.009	0.026	0.118
R Risk perception	0.001	0.000	0.000	0.001	0.000	0.000	-0.002
Mixed trusters, standard situation							
C UK	0.057	0.036	0.035	0.025	-0.009	-0.049	-0.095
Italy	0.168	0.087	0.076	0.041	-0.039	-0.122	-0.211
Germany	0.137	0.077	0.071	0.045	-0.026	-0.106	-0.198
the Netherlands	0.107	0.064	0.061	0.042	-0.018	-0.087	-0.169
France	0.188	0.087	0.069	0.027	-0.053	-0.127	-0.190
S Subjective norm	-0.003	-0.003	-0.003	-0.003	0.000	0.003	0.008
P Perceived behavioural control	-0.008	-0.006	-0.006	-0.006	0.000	0.007	0.018
A Attitude	-0.037	-0.027	-0.030	-0.027	-0.002	0.035	0.089
R Risk perception	-0.006	-0.005	-0.005	-0.005	0.000	0.006	0.016
Trusters, standard situation							
C UK	0.118	0.057	0.048	0.062	0.016	-0.079	-0.221
Italy	0.205	0.083	0.064	0.074	0.001	-0.126	-0.301
Germany	0.197	0.082	0.064	0.076	0.006	-0.122	-0.304
the Netherlands	0.144	0.065	0.053	0.065	0.010	-0.095	-0.241
France	0.291	0.099	0.071	0.072	-0.019	-0.162	-0.351
S Subjective norm	-0.002	-0.001	-0.001	-0.002	-0.001	0.001	0.006
P Perceived behavioural control	-0.007	-0.005	-0.004	-0.007	-0.005	0.004	0.024
A Attitude	-0.041	-0.026	-0.025	-0.040	-0.026	0.024	0.134
R Risk perception	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Non-trusters, <i>Salmonella</i> scare							
C UK	0.409	-0.028	-0.029	-0.092	-0.082	-0.083	-0.096
Italy	0.528	-0.048	-0.043	-0.121	-0.101	-0.100	-0.115
Germany	0.421	-0.044	-0.038	-0.102	-0.082	-0.077	-0.079
the Netherlands	0.444	-0.038	-0.035	-0.103	-0.087	-0.086	-0.095
France	0.432	-0.019	-0.026	-0.090	-0.086	-0.093	-0.118
S Subjective norm	-0.034	0.000	0.001	0.006	0.007	0.008	0.012
P Perceived behavioural control	-0.043	0.000	0.001	0.008	0.009	0.011	0.014
A Attitude	-0.052	-0.001	0.002	0.009	0.011	0.013	0.018
R Risk perception	0.012	0.000	0.000	-0.002	-0.003	-0.003	-0.004

Table A2

Variable	Intentions to purchase						
	1	2	3	4	5	6	7
Mixed trusters, <i>Salmonella</i> scare							
C UK	0.128	-0.006	-0.012	-0.030	-0.023	-0.028	-0.028
Italy	0.390	-0.035	-0.044	-0.093	-0.066	-0.078	-0.074
Germany	0.238	-0.012	-0.023	-0.055	-0.043	-0.053	-0.053
the Netherlands	0.144	-0.005	-0.013	-0.033	-0.026	-0.033	-0.034
France	0.326	-0.034	-0.039	-0.079	-0.055	-0.063	-0.056
S Subjective norm	0.003	0.000	0.000	-0.001	-0.001	-0.001	-0.001
P Perceived behavioural control	0.008	0.000	-0.001	-0.002	-0.002	-0.002	-0.002
A Attitude	-0.079	0.000	0.006	0.017	0.015	0.020	0.021
R Risk perception	0.036	0.000	-0.003	-0.008	-0.007	-0.009	-0.010
Trusters, <i>Salmonella</i> scare							
C UK	0.142	0.002	-0.011	-0.024	-0.032	-0.047	-0.031
Italy	0.259	-0.004	-0.022	-0.045	-0.056	-0.080	-0.052
Germany	0.114	0.003	-0.008	-0.019	-0.026	-0.038	-0.027
the Netherlands	0.235	-0.004	-0.021	-0.041	-0.051	-0.072	-0.046
France	0.254	-0.005	-0.022	-0.045	-0.055	-0.077	-0.050
S Subjective norm	-0.008	-0.001	0.000	0.001	0.002	0.003	0.002
P Perceived behavioural control	0.012	0.001	-0.001	-0.002	-0.003	-0.004	-0.003
A Attitude	-0.076	-0.005	0.004	0.012	0.017	0.028	0.021
R Risk perception	0.046	0.003	-0.002	-0.007	-0.010	-0.017	-0.013