

# Determinants of trust in food safety information

Determinanten von Vertrauen in Lebensmittelinformationen

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## Zusammenfassung

In den vergangenen Jahren erschütterten verschiedene Lebensmittel-skandale die Europäische Union. Diese verstärkten die Informationsasymmetrie zwischen Anbietern und Konsumenten und führten zu Vertrauens- und letztlich Nachfrageeinbußen. Um entsprechende Auswirkungen darstellen zu können, sind zunächst die Elemente Information und Vertrauen in ein neoklassisches Nachfragemodell zu integrieren. Anhand einer europaweiten Umfrage wird sodann das Vertrauen der Konsumenten in verschiedene Marktakteure sowie dessen Variabilität bei einem hypothetischen Lebensmittelskandal untersucht.

**Schlagnworte:** Informationsasymmetrie, Konsumentenverhalten, Risikowahrnehmung, Vertrauen

## Summary

In recent years, the European Union has repeatedly experienced severe food safety incidences. These incidences intensified the information asymmetry between suppliers and consumers and thus provoked a decline in trust and also in demand. In order to illustrate these effects, the elements of information and trust have to be integrated into a neoclassical demand model. Consumers' trust in different market actors and its variability in the context of a hypothetical food safety incidence will be investigated by means of a pan-European survey.

**Keywords:** information asymmetry, consumer behaviour, risk perception, trust

## 1 Introduction

In recent years, the European Union has repeatedly experienced severe food safety incidences. Generally, these incidences correspond to highly intransparent situations which foster the information asymmetry between suppliers and consumers. Evidently, the latter affects both reciprocal trust and thus demand in a substantial manner. The consumer, characterised as acting boundedly rationally in an environment of incomplete information, strives for a maximisation of his subjective expected utility. In an attempt to reduce his individual uncertainty, the consumer is assumed to acquire additional information about the future realisation of different scenarios (HIRSHLEIFER and RILEY, 1992, 299).<sup>1</sup> This aspect has received considerable attention in a number of recent studies, particularly referring to information as affecting consumers' demand for potentially unsafe food in a manner comparable to traditional neoclassical microeconomic factors (BÖCKER and MAHLAU, 1999, 242).

Trust, however, and the conditions under which it might be considered as a market determinant have so far only been sketchily discussed and applied incompletely to consumer behaviour under uncertainty (MISZTAL, 1998, 29). Against the background of a pan-European survey conducted in spring 2004, this paper aims at illustrating the impact and increasing relevance of trust as a strategy to simplify consumers' purchase decisions in an environment of incomplete information.

The remaining paper is organised as follows. In the following section, the analysis of consumer behaviour under uncertainty, generally featuring neoclassical microeconomic determinants, is extended to the elements of information and trust. Special emphasis will be put on informational trust in the environment of a hypothetical food safety incidence. In the third and fourth section, a statistical evaluation and data interpretation will follow. Finally, the paper will conclude with a summary of relevant findings and a discussion of future implications.

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<sup>1</sup> In contrast to the above, SCHNEIDER (1995) remarks that a simple change in knowledge cannot be equated with a reduction of uncertainty.

## 2 Determinants of Consumer Behaviour

Generally, all economic decisions contain elements of uncertainty such that an economic agent, even if characterised as a homo oeconomicus, is not able to ascertain the possible consequences of his decisions *ex ante*.<sup>2</sup> In an environment of uncertainty, the prevailing methodology to analyse consumer behaviour is based on the maximisation of the subjectively expected value of utility, subject to constrained factor endowments. Formally, this can be expressed as  $\max u(x)$  subject to  $p \cdot x \leq Y$ . This theory, which dominated the analysis of decision-making for decades, has identified neoclassical microeconomic factors like income and price as crucial determinants of consumer behaviour under uncertainty (von NEUMANN and MORGENSTERN, 1944).

The impact of other than purely economic determinants becomes apparent when characterising consumers as acting in a boundedly rational manner. Contrary to previous assumptions, they intend to attain certain aspiration levels within both objective and subjective limits imposed by their socio-economic environment (SIMON, 1982, 8). In this context, elements such as information or trust appear well-suited to complement the neoclassical approach in order to analyse consumer behaviour under uncertainty.

### 2.1 The Impact of Information

The impact of information on consumer behaviour is relevant if and only if the consumer operates in an environment of incomplete information. This situation prevails on an imperfect market with an either symmetrical or asymmetrical distribution of information across the market participants (HIRSHLEIFER and RILEY, 1992, 14). Since the assumption of a symmetric distribution of information appears to be a primarily theoretic entity, it will not be further considered in this article. The consumer thus operates in an environment of asymmetric information distribution. These circumstances generally favour the

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<sup>2</sup> With respect to the prevailing view in economics, the marginal differentiation between uncertainty and risk, which originally is attributed to KNIGHT (1921, 226), will be disregarded throughout this article.

supplier of a product who disposes of information which the consumer can only obtain at prohibitively high costs. Regardless of the supposed bounded rationality, consumers will attempt to reduce their individual uncertainty. Consistent with the typology of Information Economics, this can be achieved through the acquisition of additional information about the future realisation of different scenarios (HIRSHLEIFER and RILEY, 1992, 299). Implying naivety, this information might be objective. Despite its methodological attractiveness, the naïve assumption seems reasonably misleading. Information is usually provided by institutions that have an internal incentive to select certain information over other in their activities of distributing information. These institutions can either be private sources that follow a profit-maximising objective or public sources that might principally have the formal target to provide objective information. Yet, this target can easily be diluted by federal institutions that have incentives to bias the information (SWINNEN et al., 2003, 150). As a consequence, information will not be considered as objective but exclusively as either positive or negative in the following. As previous studies have illustrated, consumers judge positive and negative information in an asymmetrical manner. Apparently, the similar quantity of negative information weighs more heavily in consumer decision-making relative to positive information. The causale for this asymmetry can be assigned to principally two reasons. Firstly, the information (private) institutions provide is heavily biased. As these sources primarily follow economic objectives, emphasis is put on (negative) information that attracts public attention. Secondly, positive information is generally not considered to be particularly credible and therefore not assigned the importance of negative information – which often possesses the characteristics of a warning (DIERKS, 2004, 191).

## 2.2 The Impact of Trust

Despite the wide-spread understanding of the increasing importance of behavioural elements like trust for an analysis of consumer behaviour under uncertainty, an embedding of this multifaceted concept into economics is only little beyond its fledgling stages.

As previously mentioned, the consumer operates in an environment of uncertainty and asymmetric information distribution which generally favours the supplier of a product. The latter disposes of information which would be very costly for the consumer to obtain. If the consumer

decides not to remain in a state of ignorance, his only alternative will be to rely on the information the supplier provides. Thus, a plausible strategy aimed at reducing the individual uncertainty necessarily includes the element of trust<sup>3</sup>.

Generally, trust is defined as a trustor's intention to accept a certain vulnerability which is based upon positive expectations of the trustee's behaviour. The trustor chooses to cooperate with the trustee on the basis of a subjective probability that the latter will decide not to employ opportunities for defection that the former considers damaging (NOOTEBOOM, 1996, 988). This cooperation appears particularly reasonable when the trustor cannot obtain all necessary information for his decision (BÖCKER and HANE, 2000, 473).

Other than uncertainty which seems to be a crucial element for trust to arise, interdependence is a second, essential condition. It implies that the interests of one party cannot be achieved without at least partial reliance upon another party. Still, even provided that the conditions of risk and interdependence are fulfilled, trust will not emerge abruptly but develop gradually. In a building phase, social exchange relations slowly evolve – based on information, personal experience, and minor transactions that require only relatively little trust. These allow the trustee to prove his trustworthiness and enable both trustee and trustor to extend their relation as a prerequisite for larger transactions which occur in the stability phase. Yet, this might not be accomplished if the trustee's limits of trustworthiness suggest that the relationship does not allow for trust. That cognition as well as any violation of the developed trustworthiness results in a transition towards the dissolution phase where trust collapses once it falls below a certain threshold.

As will be illustrated in the following, the concept of trust is evidently not restricted to a food's supplier and consumer but includes, particularly in the environment of a disconcerting food safety incident, social networks and informational sources, among others.

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<sup>3</sup> Particularly when referring to the credence qualities of a good, trust appears to be a plausible strategy to reduce individual uncertainty in an environment of imperfect information.

### 3 Data

The impact of informational trust on consumer behaviour under uncertainty was empirically assessed through a pilot study among 126 European households which was conducted throughout April 2004. In May 2004, the survey was extended to 2,725 thirty minute, face-to-face in-home interviews of which 451 (16.6%) are assigned to the German sample on which this article will focus. Since the respondent is the person responsible for the purchase and preparation of food, the sample shows a strong prevalence of married (63.0%) females (70.0%) with a mean age of 45 years. Of the 451 respondents interviewed, 118 (26.1%) have completed a tertiary education. Other characteristics seem reasonably balanced.

Following these introductory remarks, special emphasis was placed on the perception of food safety information, information sources and trust in the environment of a hypothetical food safety issue involving chicken. Chicken was selected as a popular food of frequent purchase throughout Europe (see table 1).

*Table 1: The frequency of purchasing chicken in Germany (Europe)<sup>4</sup> in percent*

<b>How often do you buy ... for your household?</b>	<b>any type of chicken</b>	<b>fresh chicken</b>	<b>frozen chicken</b>
Never	10.9 (9.4)	21.7 (15.7)	27.9 (62.0)
Not every week	53.2 (41.6)	60.1 (44.5)	58.5 (28.7)
Once a week	29.0 (34.6)	16.6 (31.0)	12.6 (7.9)
Twice a week	5.8 (11.2)	1.3 (6.8)	0.9 (1.1)
Three times a week	1.1 (2.6)	0.2 (1.5)	(0.3)
More frequently	(0.6)	(0.4)	
Total	100.0	100.0	100.0

The general perception of chicken is consistently positive with 63.3% (56.6%) of the respondents regarding chicken as a safe food and perceiving its safety as comparable to that of fruits and vegetables (see table 2). Given that only 10.9% (9.4%) of the respondents never buy chicken for their household whereas 35.9% (49.0%) buy it at least once

<sup>4</sup> In the context of this article, Europe refers to the United Kingdom, France, Italy, the Netherlands, and Germany. The survey was conducted in these countries.

a week, a food safety incidence in this area is assumed to affect a greater part of the interviewed.

*Table 2: Perception of health risks due to the consumption of chicken in percent*

<b>How would you judge the consumption of chicken (beef) in terms of risk to your health?</b>	<b>Germany</b>	<b>Europe</b>
Negligible	18.4 (11.3)	26.1 (21.8)
2	26.6 (18.6)	26.4 (23.3)
3	17.3 (18.2)	16.1 (16.7)
Balanced	26.4 (33.3)	19.6 (23.6)
5	6.9 (15.1)	8.2 (10.5)
6	4.4 (3.5)	2.8 (2.6)
Extremely high		0.9 (1.4)

According to table 2, chicken is generally perceived to be a relatively safe food with 18.4% of the respondents indicating that health risks arising from the consumption of chicken are negligible. Only 11.3% share this opinion when substituting chicken for beef. Moreover, 62.3% of the consumers perceive chicken-related risks as less than balanced compared to 48.1% when regarding beef instead. Comparing these values to the European average (68.6%), German respondents appear to be considerably more cautious. This is further endorsed through the perception of beef-related risks that an average of 61.8% but only 48.1% of the Germans perceive as less than balanced.

Still, before confronting the respondents with the food safety incidence, a rank order indicating the consumers' level of trust in different sources (1 = distrust; 7 = trust) was compiled (see table 3).

Among the most trusted information sources are, as expected, as well food safety authorities (6.0 and 5.5) as consumer organisations (6.0) and the previously not mentioned health professionals and scientists. Relatively little trust, in contrast, is uttered towards producers (4.9), retailers (4.5), and national governments (4.7). However, especially German respondents, predominantly younger, appear to be slightly submissive to authorities, considering that their trust in the respective institutions clearly exceeds the European average without exception.

Table 3: Trust in different sources prior to a (hypothetical) food safety incidence

<b>Would you trust ... regarding information about salmonellae?</b>	<b>Germany</b>	<b>Europe</b>
Supermarkets	4.5	4.6
Chicken Producers	4.9	5.0
Federal Food Safety Authority	6.0	5.8
National Government	4.7	4.5
European Food Safety Authority	5.5	5.2
Consumer Organisations	6.0	5.7
Media	5.5	5.0

Consequently, trust in the federal food safety authority (6.0) exceeds trust in its European counterpart (5.5). Paradoxically, media is simultaneously trusted and distrusted, depending on the respective source and the current decision situation (see table 4).

Table 4: Information sources after an outbreak of a food-borne disease in percent

<b>Where would you obtain additional information regarding the incidence?</b>	<b>Germany</b>	<b>Vested interest in misinformation</b>
Supermarket	10.0	
Television news	46.7	23.5
Radio	33.3	9.2
Broadsheet newspaper	3.3	52.9
Tabloid newspaper	3.3	47.1
Magazines	13.3	29.4
Would not bother to find	26.7	

When confronted with the occurrence of a chicken-related disease in their adjacency, 46.7% of the respondents relied on television news for additional information whilst 33.3% preferred the radio. Surprisingly, broadsheet newspapers were not consulted in this context (3.3%) but presumed to have a vested interest in misinformation (52.9%). Tabloids (3.3%) are perceived to be less interested in misinforming their readers (47.1%). These findings are in strong contrast to the European average, indicating that newspapers are both a major (31.7%) and trustworthy (72.4%) source of information. Only German consumers seem to have doubts regarding the credibility of newspapers and correspondingly refrain from their use in the environment of a food safety incidence. A quarter of all respondents (26.7%) indicated that they would not bother to obtain any additional information.

In another step, the relationship between trust in different suppliers of chicken and the number of children in the household was determined (see table 5). The analysis was constricted to households with one child. A value of one hundred corresponds to the maximum level of trust obtainable.

*Table 5: Trust in suppliers and children in the household*

Which of the following suppliers of chicken do you consider trustworthy?	Household with		Total
	no child	one child	
Organic farmers	59.0	72.2	65.0
Conventional farmers	61.9	59.8	60.9
Industrial Poultry Breeder	27.6	35.8	31.4
Brand Producer	39.9	44.3	41.9

According to the prevailing opinion in literature, persons occupying the so-called gatekeeper's function and thus being responsible for the purchase and preparation of food are particularly alert and only little trusting (HERMANN et al. 1997, 518). Correspondingly, a discrepancy between households with children and those without could be expected. Surprisingly, the above findings show no systematic support for the previous assumption. Only in the case of organic farmers, a significant difference between households with children (72.2) and those without (59.0) is obvious whereas the other cases do not seem to follow a systematic pattern. Hence, the presence of children in a household has no effect on the level of trust. This also accounts for the respondent's gender which appears to be of subordinate importance regarding the level of trust in different suppliers.

#### 4 Results

The findings presented above offer a preliminary description of trust and its impact on consumer behaviour in the environment of a food safety incidence. Since the statistical evaluation is not yet completed, the information content is still limited. Yet, even at this admittedly early stage of the analysis, the following conclusions can already be drawn.

In their process of decision-making under uncertainty, particularly in the environment of an alarming food safety incidence, consumers do

not exclusively rely on neoclassical microeconomic factors like income and price but increasingly include determinants such as information and trust, for example. Particularly the latter is presented as a plausible strategy to reduce the individual consumer's uncertainty in the context of incomplete information. This assumption is emphasised by empirical findings suggesting that 73.3% of all respondents would attempt to find additional information following the (hypothetical) outbreak of a food-borne disease. In doing so, consumers rely on information sources that are perceived to be relatively trustworthy, among them both national and European food safety authorities, consumer organisations, health professionals, and university scientists. German consumers appear to be particularly submissive to authorities with their trust in the respective institutions exceeding the European average. Blind trust in any of these sources, however, has not been observed. The image of media as a trustworthy source appears to be ambiguous. Whilst 46.7% of the respondents would rely on television news which only 23.5% consider to have a vested interest in misinformation, only 3.3% would rely on newspapers. Surprisingly, almost 53% of the respondents presume both broadsheet and tabloid newspapers to have other than purely informative objects. Among others, this also accounts for producers, retailers, and national governments which are perceived to be significantly less trustworthy. In contrast to the prevailing opinion in literature, neither has the presence of children in a household nor the respondent's gender any significant effect on the level of trust.

## **5 Summary and Implications**

This article has illustrated that an analysis of consumer behaviour economic determinants but necessarily needs to include informational and behavioural aspects like trust.

A pan-European empirical survey conducted in spring 2004 indicated that particularly in a decision situation with imperfect information, consumers actively seek further information to reduce their individual level of uncertainty. As previously expected, information sources are judged differently in terms of the perceived trustworthiness. Federal institutions and consumer organisations are considered to be relatively trustworthy whereas private institutions are remarkably less trusted.

This corresponds to the assumed information asymmetry which generally favours the suppliers of a potentially unsafe product.

Following the statistical evaluation of the data, trust and the conditions under which it might be considered as a market determining factor will be integrated into a demand model. The latter is designed to simulate and comprehensively elucidate consumer behaviour following a food safety incidence. Hence, other than only economic variables, i.e. determinants such as the consumer's personal predisposition towards trust, for instance, need to be introduced into the analysis in order to provide a more comprehensive explanation of so complex a field as consumer behaviour.

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