# Consumers' Willingness to Pay for Additional Information on Food Quality and Safety

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# CONSUMERS' WILLIGNESS TO PAY FOR ADDITIONAL INFORMATION ON FOOD QUALITY AND SAFETY

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Abstract

Most quality properties of food products can be considered as *credence characteristics*, quality of which cannot be inferred before the purchase, and sometimes not even after the purchase. Our objective is to assess how much consumers are willing to pay (WTP) for meat products, of which e.g. origins and production practices are known, especially with regard to safety issues. Results indicate that 59 % of Finnish consumers are willing to pay more to get information about safety and quality of beef products. Consumers are most concerned with diseases caused by food of animal origin.

Keywords: beef, information, credence attributes, willingness to pay

## 1. Introduction

In recent years the quality and safety of food and ethics of agricultural production have become increasingly important to European citizens due to the crises which have affected foodstuffs, animal health and livestock transportation in the European Union. In Finland, there have not been similar, widely affecting food crises such as BSE or FMD common in many other EU countries. The first, and this far also the only BSE case was found in Finland in December 2001, and no FMD cases were detected during the large-scale FMD crises in some other EU countries. In addition to these crises the introduction of GMOs in agricultural production has also increased consumer concerns and uncertainty related to foodstuffs. In this kind of situations information is crucial.

This study examines the role of information in the beef supply chain, and the economics of information constitutes an appropriate theoretical framework for this. Like other markets, the functioning of the food market suffers from imperfect and asymmetric information. This phenomenon is at least as current today as it was in the 1970s, when American professors of economics George Akerlof, Michael Spence and Joseph Stiglitz studied the information problems in the market and laid the foundations for the economic approach used in this paper. These professors were awarded the Nobel Prize in Economic Sciences in 2001, which shows that such an approach is still valid and necessary.

Previous studies shows that consumers desire more and more information about quality and safety aspects of food. Additional information was desired particularly regarding meat and meat products (Järvelä 1998a, b). Consumers accept a label of origin as a signal of food safety and quality, because present supply of quality information is imperfect (Finfood 2000).

There are two parallel developments of information provision in beef supply chain, which will increase the amount of credence characteristics about beef quality and safety. First, the National Quality Strategy is launched by all parties involved in foodstuffs production to express the competitive advantages and strengths of Finnish food products relating to quality, safety, ethics, and ecology. The exchange of information within foodstuffs production will be systematically collected and stored in a special data bank. Second, a beef identification and labeling system in the European union was developed primarily to reassure the safety of beef products and to increase transparency and traceability of beef products in supply chain. Future developments of this labelling system could

include more information about the origin of a product, aimal welfare and other properties connected with a production process. Throug these systems more information about credence characteristics of beef safety and quality will be available to consumers. However, benefits of additional food safety and quality information to consumers are not adequately well studied.

This study attempts to meet this demand for additional research by finding out whether consumers are willing to pay for additional information about beef quality and safety. Consequently, the aim of this study is to evaluate, both qualitatively and quantitatively, the value of new information about and the information systems set for credence characteristics of beef. Economics of information is employed as the theoretical framework. The quantitative approach focuses to measure the *ex ante* value of credence characteristics, and the method of contingent valuation is applied for this purpose.

## 2. Information and market functioning

Consumers lack information about quality properties of most goods on the market. Within the economic framework the information problems on the market were studied as early as 1970, when Akerlof showed that markets fail in the presence of information asymmetry. He argued that bad quality ultimately drives out good quality from the market, if information asymmetry exists between sellers and buyers. If quality cannot be signaled, good quality products cannot get a price premium and, accordingly, only bad quality products will be offered for sale (Akerlof 1970).

Becker (2000) applies this example to the functioning of the meat market. In today's meat chain the raw material is purchased from further and further away, which means that information on the characteristics of the meat is not available in the same way as earlier, when it was bought directly from the local producers. The production of high quality foodstuffs costs more, and if there is no additional price for higher quality on the market, the quality will deteriorate, and only lower quality products enter the markets. This means that the quality of the products in the consumption is also weaker. However, the consumers might be willing to pay more for higher quality, thus compensating for the higher production costs, if the differences in the quality were efficiently communicated to the consumers.

Important progress was made when goods were categorized into *search, experience and credence* quality attributes on the basis of how consumers can evaluate the quality aspects of products (Nelson 1970, Darby and Karni 1973). A search good is one whose quality is determined before purchase, an experience good is one whose quality is determined after purchase, and quality of a credence good cannot be determined either before or after the purchase. Many of the characteristics relating to the safety of foodstuffs are classified as credence quality attributes, because it is difficult for the consumers to assess them by themselves. In order to obtain more information on them, they have to rely on the seller or outside observers (Andersen 1994). In the case of food risks that can only be found in the long term, it is very difficult to establish the connection between the quality of the original food product and the illness it may have caused (Henson ja Traill 1993).

Based on the above classification, Becker (2000) highlights the costs due to the need to acquire more information. The costs are the lowest in the case of quality attributes that are based on external observation, which are available through the senses. Assessing the quality of an experience good in advance involves high costs, but these attributes can be assessed quite easily and at low cost in connection with or after the use. However, in the case of credence attributes the assessment of the quality involves high costs both before and after the consumption.

The availability of quality information is very important for the functioning of the market. Markets function quite well in terms of characteristics based on external observation and, to some extent, experience quality attributes. This is because consumers learn about quality after using the product. However, both private and public measures are needed for the markets to function properly in terms of the credence quality attributes in order to guarantee availability and quality of the necessary information (Caswell ja Mojduszka 1996).

As stated above, food safety is usually defined as a credence attribute since consumers cannot measure quality and cannot learn it through his or her experience of consuming the product (Henson and Traill 1993). Such quality properties included in this study are environmental impacts, animal

welfare, and a country of origin. Most of these properties are connected with features derived from a production process.

The amount of information available from the credence characteristics is crucial. Information is usually considered as a public good, and for that reason it is undersupplied in the market (Henson and Traill 1993). The nature of public good is nonrival and nonexcludable. However, Antle (1999) argues that information can be considered as a club good that is nonrival but excludable. In that case the role of government is to create the legal framework that enables consumers to obtain and use information. Consequently, one important question is that which actor(s) in the food chain should offer the required information, by what means and at what cost. Different types of contracts and quality systems could be an answer also for the demand for credence characteristics in the food products. These contracts and systems, their contents and impacts, urgently need further research, including the more novel netchain analyses, in order to make the food chain to operate efficiently (see e.g. Ziggers et al. 1998; Lazzarini et al. 2001; Omta et al. 2001; Vertanen 2001).

## 3. Survey design

There is no market data available for examining willingness to pay (WTP) for new, additional information. The most commonly used method to measure economic benefits for a nonmarket good is the contingent valuation method (CVM). In this method consumers are asked *ex ante* their WTP in order to obtain a benefit, which is presented in hypothetical scenario concerning the good in question. The other well-known and quite often employed methods are cost-of-illness (COI) method and hedonic price (HP) analysis. According to our and others' evaluations of the COI and HP methods, which are based on wider assessments in the relevant literature (e.g. Jensen and Basiotis 1993, Buzby et al. 1996), we choose the contingent valuation as the most applicable method for our objectives. It is most often used method in studies dealing with food quality and safety characteristics. The difficulty of the CV method is usually that it is used for valuation of a good, often a public good, without a price on some imaginary markets.

In our study this is not so serious a problem as we do have a real, private good, i.e. beef, with a price on actual markets. As a research method the CV method requires a survey, in which the consumers/citizens are asked how much they would be willing to pay for the supply or production of a public good, e.g. the reduction of health risk (Henson 1996). In our survey we asked consumers how much they would be willing to pay for additional information concerning quality and safety characteristics of beef. The main survey was conducted with the aid of the GallupKanava panel, which is a system in which answers and information is collected via personal computers from overall 1,300 regular respondents for different surveys and opinion polls. One third of the sample is changed annually in the GallupKanava system. In our study the statistically representative sample comprised of 1,000 households. The answers were given by those persons, above 15 years of age, in the household who usually make the purchasing decisions, i.e. there could be more than one respondent in a household. The CV questionnaire included questions about consumers' (1) buying and preparing habits of beef, (2) paying attention to present labels and other information, (3) risk perceptions, (4) awareness of food safety risks, and (5) demographics.

## 4. Results

There were 1,640 usable questionnaires. Of the 1,640 respondents, 22% were the primary shoppers for the household and 54% "split shopping duty in half" with someone else. 95% of the respondents eat beef, or food products made from beef, one third of them at least weekly. Hence, they know the product and are assumed, to some extent, to be aware of the characteristics associated to beef and food products based on beef.

First, the respondents were asked how often they pay attention to the present information or labels in beef products. Results indicate that most important information or properties in the present situation are the dates of expiration and packaging, and colour of beef. The third important factor to which consumers clearly pay attention was the label marked 'Finnish Beef'. The price of beef was

mentioned as the fourth important factor. Among the respondents the concern towards foodborne diseases of an animal origin (salmonellosis, E.coli O157:H7) was higher than concern for other risk factors in food (Figure 1).

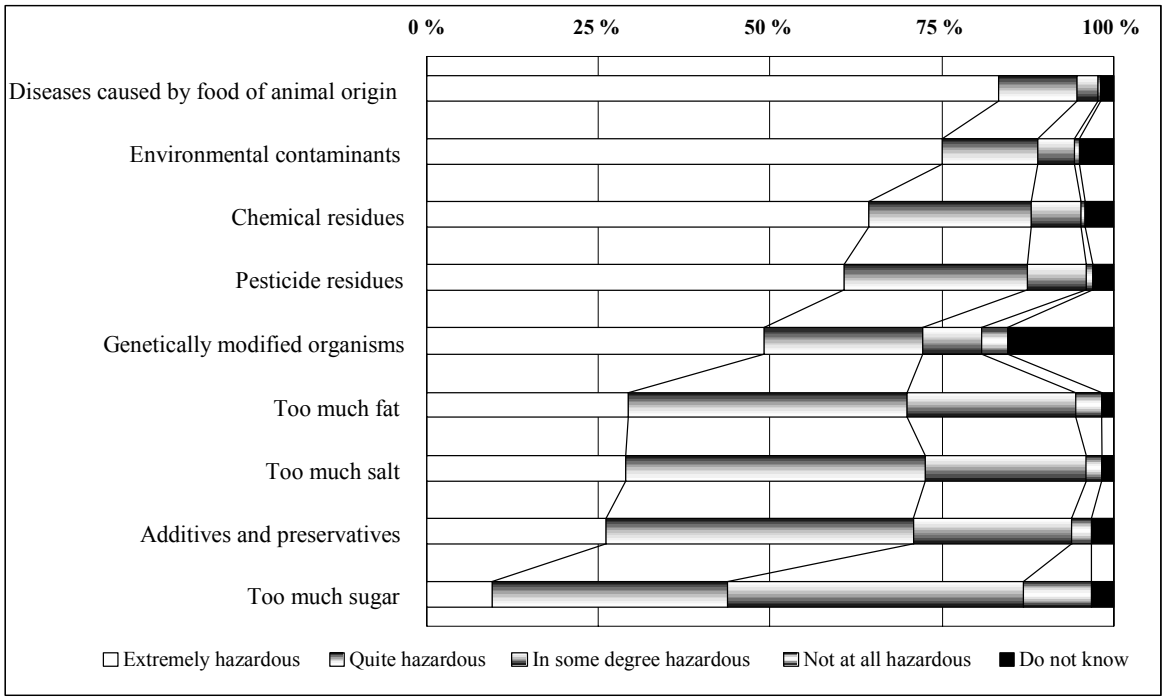


Figure 1. Comparing food safety concerns.

Concerning need for additional information, consumers desire more information about (1) the control of food of animal origin, (2) GMOs used in animals, (3) country of origin and (4) whether or not hormones are used in animal production. All of the respondents were given a brief description of the new data bank system, which is currently under development. 75% of respondents indicated that new quality data system, which would give more information to consumers, would be beneficial to them. The aim of the question was that the respondents could express their opinion without linking this to their WTP. After the description of the beef identification and labelling system, they were asked about WTP for additional information about beef.

59 % of the respondents were willing to pay a premium to get additional information. The main reason behind zero-WTP (41 % of the respondents) was that consumers were satisfied with the present information of labels (35%). The other reason mentioned was that they simply cannot pay more. Thirdly, it emerged that 17% of the zero-WTP respondents lack trust on this system or they did not get enough information about it (13%) (Table 1).

Table 1. Reasons for zero-WTP.

| Reasons mentioned for zero-WTP | **Number** | **%** |
|---|---|---|
| Present labels guarantee the safety and quality | 305 | 35 |
| Cannot afford on higher prices | 197 | 22 |
| Labelling guarantees nothing | 120 | 17 |
| Not enough information | 110 | 13 |
| Vegetarian or eat beef rarely | 34 | 3 |
| Do not care | 30 | 3 |
| Other | 34 | 4 |
| Total of reasons mentioned | 894 | 100 |
| | | |
| Total of the zero responses | 679 | 41 |
| Total of the positive responses | 961 | 59 |
| Total of respondents | 1640 | 100 |

In our study two different methods are employed to elicit consumers' WTP for information provision about beef safety and other quality attributes. In the dichotomous choice (DC) method consumers choose between "yes" or "no" to valuation questions. We also used polychotomous choice (PC) where respondents are given a multiple choice. The rationale behind the PC method is that it provides more information to the researcher than does the DC question because more can be learned about the intensity of a consumer's intentions towards the scenario. Results are presented in figure 2 and 3.

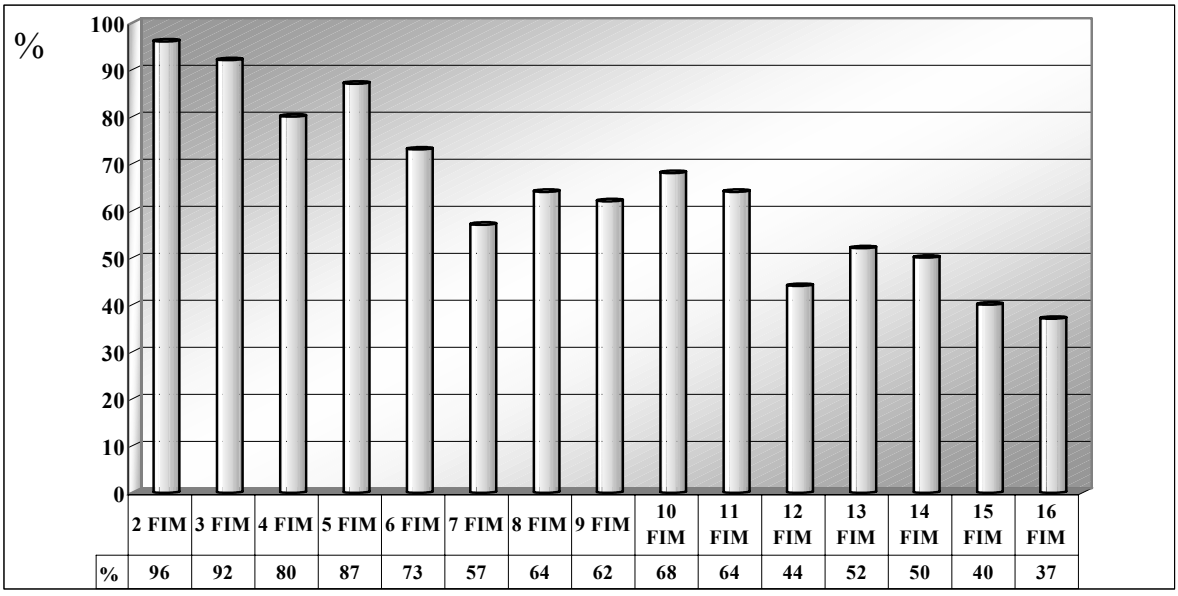


Figure 2. Percent of positive answers to bid ranged between 2-16 FIM.

The "yes"-respondents, i.e. 59% of the sample who were willing to pay a higher price for beef in order to receive additional safety information, were offered a sum, which varied between FIM 2-16 per kg of beef. They were also provided the information stating that the average prices for ground beef and roast beef were FIM 33/kg and 50/kg, respectively. 50 % of the total respondents were willing to pay at the maximum FIM 14/kg more for beef in order to receive additional safety information from beef (Figure 2). However, PC question indicated less WTP than DC questions (Figure 3).

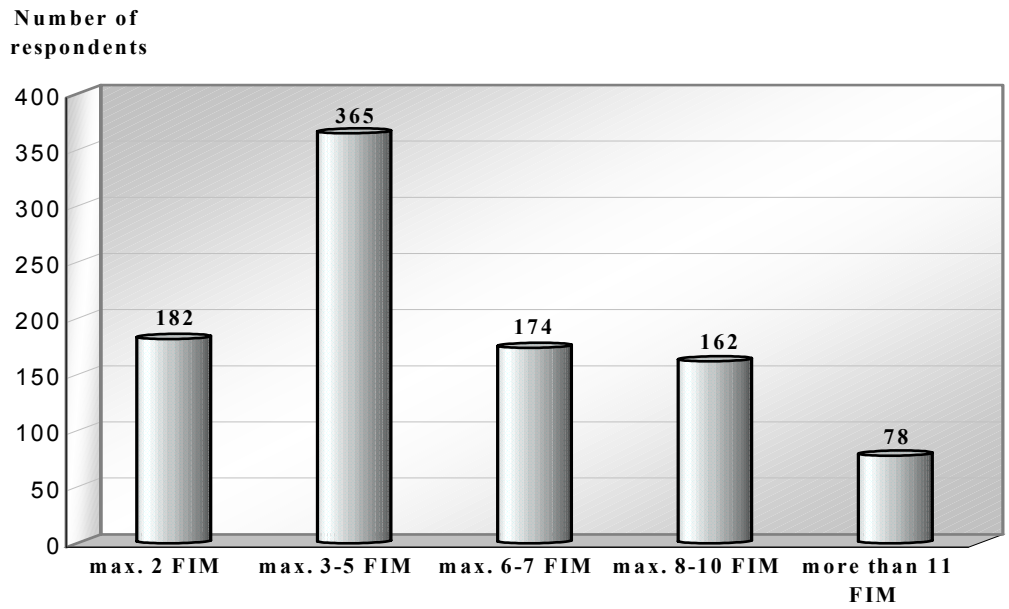


Figure 3**.** Frequencies of WTPs presented as a multiple choice question. (the average prices for ground beef and roast beef were FIM 33/kg and 50/kg, respectively)

## 5. Conclusions

In the beef supply chain there are two parallel information-based policies in Finland, which will increase the credence characteristics of beef quality and safety.

- First, the *National Quality Strategy* was drawn up by all parties involved in foodstuffs production to express the competitive advantages and strengths of Finnish food products relating to quality, safety, ethics, and ecology.
- Second, a beef *identification and labelling system of the European Union* was developed primarily to secure the safety of beef products and to increase the transparency and traceability of beef products in the supply chain. Through these systems more information about the credence characteristics of beef safety and quality will be made available to consumers.

Survey results indicate that:

- 59 % of Finnish consumers are willing to pay more to get information about safety and quality of beef products.
- Zero-WTP (41 %) for additional information exists mainly because consumers feel that the present labels guarantee the safety and quality already well enough.
- Consumers are most concerned with diseases caused by food of animal origin.
- Consumers desire more information about the use of GMOs in livestock production, the country of origin, and use of hormones in livestock production.
- Public authorities and policies are regarded as the most reliable source of the information concerning safety and quality of food products.

In more general terms, we can conclude that in the future the demand for better information of all quality attributes of food products will be satisfied to a growing extent by electronic databases and other electronic business means of modern information technology. Then consumers will easily be able to check, *inter alia*, the origins, production practices, and processing- and delivery-related details of food products. This creates a new possibility to develop local, high quality and very safe products for certain, selected consumer segments, which are looking for more reliable and consistent information than what is currently available for their choices and purchases of food products. Hence, further research should be directed at a more accurate analysis of different consumer groups and their

characteristics by e.g. cluster analysis. In addition, the statistical modelling of willingness-to-pay with regard to both the dichotomous question structure and multinomial logit analysis is a part of the future research in this field.

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