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**How consumers link traceability to food quality and safety:  
An international investigation**

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# How consumers link traceability to food quality and safety: An international investigation.

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**Abstract.** It is not yet understood whether the implementation of traceability systems can contribute towards restoring consumer confidence in food quality and safety, one of the goals of the European Food Law. To date, little is known about how consumers perceive the role and potential impact of traceability within the supply chain. This paper aims to provide insight into how traceability information can offer guarantees of food quality and safety, and contribute towards increased consumer confidence. Data, collected in four EU countries, examines salient cognitions and attitudes that underpin consumer beliefs about product traceability that will influence their decision making. It will link traceability-related food attributes to perceived benefits (in terms of quality and safety) and important consumer values. Furthermore, variations between different consumers are examined to illustrate how the concepts of food safety and food quality may have different meanings and consequences in the various European countries. Understanding which benefits consumers associate with traceability will assist in providing consumers with traceability information in line with their requirements.

**Keywords:** Traceability, Consumer Perception, Food Safety, Food Quality

## 1. Introduction

The European General Food Law (GFL) that provides regulations regarding traceability is also aimed at restoring consumer confidence, which is said to have declined in recent years <sup>[1, 2]</sup>. The GFL ensures that systems suitable to facilitate rapid recall of foodstuffs are implemented, should a food safety incident occur. However, it is not yet known whether the implementation of traceability systems will also facilitate (the restoration of) consumer confidence in food quality and safety. Before we can conclude that traceability can positively influence confidence, we need to study consumer perceptions of traceability systems, together with the impact of information that comes available to consumers through these systems, on consumer confidence <sup>[3]</sup>. To date, little is known about consumer perceptions of, and demands regarding, food traceability. The limited number of studies that have been conducted thus far have primarily focused on consumers' perceptions of traceability of one particular product (e.g. meat) <sup>[4, 5]</sup>, and not beliefs about traceability in general. These papers have shown that people have little notion about what traceability is <sup>[6]</sup>, and are not very interested in the technical aspects associated with traceability <sup>[7]</sup>. It is therefore unlikely that emphasizing the technical aspects of traceability is going to boost consumer confidence. Thus it is important to investigate what benefits people *will* derive from traceability systems and whether these benefits will lead to improved confidence.

Food safety and food quality seem to be two very important elements of people's conceptions of food and associated decision-making (i.e. food choice) <sup>[8, 9]</sup>. Traceability is usually associated with food risk and safety issues <sup>[6]</sup>, but can potentially be used both to ascertain both food safety and food quality. For example, traceability may be a powerful tool to help to establish the authenticity of food, and to check that claims made by producers about food are true. Consumers might be especially interested in traceability when it is linked to these types of quality assurances <sup>[5]</sup>. Therefore, the current paper investigates the impact of traceability on consumer confidence, with a special focus on the relation with food quality and food safety.

It is necessary, however, to take consumers' background into account <sup>[10]</sup>. Different consumers may have different concerns regarding traceability, for example depending on individual differences or on a socio-demographic basis (i.e. cultural background). It is believed that people from different cultural backgrounds have

different perceptions and experiences related to food (e.g. <sup>[11, 12]</sup>), and therefore some are more oriented towards food quality, whereas for others food safety is their main concern. The distinction that is often made in Europe is between the more northern or central countries (e.g. UK, Scandinavia and Germany) and the more southern, or Mediterranean countries (e.g. France, Spain, Italy and Greece). Southern cultures are thought to be more involved with food quality and the pleasures that can be derived from eating <sup>[13]</sup>. In comparison, the northern cultures put more emphasis on food safety and ethical concerns (e.g. about animal welfare) play a more important role <sup>[13]</sup>. The empirical evidence for this distinction is somewhat scarce.

The current study therefore examined how people from different European cultural backgrounds link traceability to food safety and food quality. Benefits and links to traceability were investigated by means of a laddering study, and some additional information about the role of quality and safety was obtained through semi-structured follow up interviews. It was expected that in the southern European countries quality would be the main benefit to be derived from traceability related information, whereas in the northern countries traceability would be primarily related to food safety.

## **2. Method**

### **2.1. Participants**

One hundred and sixty three consumers from four European countries (Germany, France, Italy and Spain) participated in this study. Consumers were recruited on the basis of obtaining a balanced sample for gender (58% women), age (roughly about one third in each of the following categories: under 30's, between 30 and 50, and over 50's) and education (due to the demands of the laddering task, only people from middle (51%) and high (47%) educational backgrounds were targeted).

### **2.2. Procedure**

Participants rated 15 attributes regarding their importance in relation to traceability (e.g. geographical origin). These attributes were derived from focus group research <sup>[14]</sup>. Laddering (see <sup>[15]</sup> for a detailed description of this procedure) was applied to those attributes most important to the participants. The ladders obtained from participants were content coded and further analysis was carried out with the assistance of the software package MecAnalyst, resulting in Hierarchical Value Maps (HVM).

In addition to the laddering task, some questions were asked about food quality and safety in a semi-structured follow up interviews. These questions related to the perceived importance of quality and safety in general, as well as for product choice; the perceived link between quality and safety as well as the link between these concepts and traceability. The answers were analysed with assistance from Atlas.ti, and the number of times a particular response was obtained was counted (also per country).

## **3. Results and discussion**

### **3.1. Quality and safety as benefits from traceability**

In this paper we will focus on the laddering results pertaining to food quality and safety only. Both quality and safety appeared as central concepts in the HVM aggregated over countries <sup>[16]</sup>, with safety being the more abstract. The main concepts that were shown to precede quality were presentation of a quality label, information about the production method, the perception of a product being controlled and guaranteed and origin. Quality was seen to lead to taste, health, safety and pleasure. Similarly, safety was seen to be the

consequence of control, origin, best before date and quality, while resulting in health and a feeling of calm. Both quality and safety were linked to trust/confidence.

In addition we examined how often the concepts of quality and safety were mentioned as benefits in the laddering study. As can be seen from table 1, the concepts of food quality and food safety tended to occur equally in the overall HVM.

**Table 1.** The relative number of times (%) quality and safety appeared as concepts in the laddering study.

	Total	Germany	France	Italy	Spain
Quality	55,5	60,7	57,3	43,8	57,5
Safety	44,5	39,3	42,7	56,2	42,4

When we compare the responses of the participants from the different countries we see that the difference in the appearance of the concepts in the HVM was the largest in Germany with more responses related to quality than safety, whereas Italy was the only country where safety appeared more often than quality. These results were reflected in the importance of food quality and safety as obtained through the interviews (see below).

In addition to the laddering, participants were asked in the interviews to indicate how they perceive the link between traceability and quality and safety. The majority of responses referred to both quality and safety being related to traceability in consumers' views (69%). For others safety was related to traceability but quality was not at all related, or less so (20%), whereas another 6 % of the responses indicated a link between traceability and quality (but not/less to safety). Finally, 8% did not perceive a link. No obvious differences between the countries were observed regarding these links.

To conclude, from the prevalence and the perceived links it seems that traceability in consumers' mind is connected safety as well as quality. However, overall somewhat stronger links with safety were established.

### 3.2. Relationship between quality and safety.

The results of the laddering indicated that quality and safety are related concepts. Quality was a less abstract concept in the HVM, and was directly linked to safety. Quality was seen to indicate safety 23 times, whereas safety was seen as an indicator for quality only 6 times. This means that when we ask people why quality is important to them, they respond that this means that the product is safe. Thus, in this sense, when people perceive a product as being of good quality they assume that this product is safe.

In line with the results of the laddering part of the study, the semi-structured interviews showed that the majority of the responses referred to quality and safety being interrelated. According to 12% of the responses, quality and safety can be considered as basically the same thing, 16% said they were related without specifying the relationship, 33% indicated that quality implies safety, and 19% said safety implies quality.

Six percent of the responses referred to quality not implying safety, and another 7% of safety not implying quality. In addition, only 6 % of the responses indicated that quality and safety are considered not to be related or clearly different. There were no major differences between the countries.

In sum, both from the results obtained through the laddering and the semi-structured interviews, we can conclude that for consumers quality and safety are strongly related concepts and that for the majority of the people the link exists in terms of product quality implying product safety rather than a safe product implying a quality product. For a certain proportion quality and safety actually mean the same thing when we talk about food.

### 3.3. Importance

The results from the semi-structured interviews confirmed the comparable importance of food quality and safety in general (see Table 2). Whereas food quality was more important for some respondents, for an equal number food safety was more important (38 and 37% respectively). Also, a considerable proportion was not able to indicate one concept being more important than the other (25% of responses).

**Table 2.** The proportion of responses regarding the importance of quality and safety.

	Total	Germany	France	Italy	Spain
Quality more important	38%	38%	45%	23%	40%
Safety more important	37%	19%	45%	50%	32%
Both important	25%	42%	10%	27%	28%

When asked which concept - safety or quality - was more important when choosing products during purchase most respondents claim that both quality and safety determine their product choice (47 %); 35 % claim that quality (but not safety) determines the product choice, whereas 14 % based their choice on safety (but not quality) (see Table 3). Thus, although people think that safety is an important concept, it is less important in their product choice. One reason for this might be, as respondents indicate, that the safety of the product should be guaranteed in any case and therefore it is not a purchase criterion. Also, some people indicated that they cannot verify themselves the safety of a product, but rather trust producers etc. to deliver safe food, and can therefore not base their decision on it.

**Table 3.** The proportion of responses regarding the importance of quality and safety in product choice.

	Total	Germany	France	Italy	Spain
Quality more important	35%	42%	48%	21%	28%
Safety more important	14%	5%	20%	19%	8%
Both important	47%	49%	31%	60%	55%

Note: percentages do not add up to 100% because of the omission of the 'other' category from the table.

## 4. Conclusions

The results of this study show that quality and safety are both linked to traceability cues, whereas safety was implicated by traceability more often. Especially in Italy, strong links between traceability and safety were observed (see also <sup>[17]</sup>). Thus, whereas traceability is as yet primarily viewed as a tool for the food safety by providing means for recall, it was also related to food quality. Since both quality and safety were shown to be related to confidence, the results show that traceability may indeed boost consumer confidence through quality and safety assessments.

However, this relationship needs to be interpreted by taking into account the additional results that were obtained through the semi-structured interviews. Analysis of these interviews clearly showed that for consumers the concepts of food safety and food quality are interrelated (as sometimes even thought to be exactly the same thing). For most consumers quality is an important indicator of food safety. Thus, whereas previous research has mainly perceived safety as a quality cue or attribute <sup>[9, 17]</sup>, we show here that the reverse might be equally true, meaning that a product that is perceived as being as of good quality is seen as a safe product. In fact, people might claim that a safe

product does not imply quality at all, primarily in the sense of taste etc. Thus, safety should be considered as an important part of quality <sup>[18, 18]</sup> without necessarily implying it.

It is interesting to note that the results do not support a strong divide in preferences for food quality and food safety across Northern and Southern EU member states. In fact, respondents from all the participating countries showed concerns for both food quality and food safety. Hence, it is evident that when we study food choice we need to be careful in interpreting results that indicate that food quality, and not food safety, is a main determining factor. The fact that quality is shown as an important factor does not necessarily mean that safety is not important to consumers (e.g. consumers in quality-oriented countries). Indeed, consumers may indicate that quality is most important, either because to them this implies safety anyway, are assuming that for all products sold a basic level of safety is guaranteed and therefore safety is a factor that does not differentiate products when making purchase decisions, or because they feel they cannot personally assess the safety of food products. When people cannot determine the safety of a product themselves, they have to rely on their trust in the producers and other chain actors <sup>[18, 2]</sup>. Therefore, it might be advisable to focus communication about traceability to consumers more in terms of quality – information that consumers may be able to use better and more confidently in purchasing decisions.

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