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# **Consumers' Acceptability and Rejection of Food Traceability Systems, a French-German Cross-Comparison**

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## Consumers' Acceptability and Rejection of Food Traceability Systems, a French-German Cross-Comparison<sup>1</sup>

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### Introduction

Food traceability is mandatory since 1<sup>st</sup> January 2005 in the EU. Traceability of products and activities in the food supply chain is a new factor of competitiveness in agribusiness that connects producers to consumers and is deemed to be an important criterion of perception of food product quality and safety for consumers. Within the food industry, traceability is absolutely essential to provide consumer assurance about the sources and safety of food, to allow identification of the source of infected or substandard product, for disease control and residue monitoring, for support measure verification, and to satisfy the requirements of labelling regulations. Despite growing interest in traceability systems and recognition of the need to act more market oriented, very little research has been done on consumer needs and perception of traceability. Researchers as well as managers have mainly focused on technical solutions.

This paper tries to contribute to i) get a deeper understanding of the role of the “ability-to-trace” in consumer decision-making process with respect to food, ii) measure consumers' acceptability for food traceability, iii) check the differences of these matters across France and Germany.

**Keywords:** *Food Traceability, Focus Groups, Means-end Chains, Consumer Attitudes*

### Consumers and food traceability: strategies for risk minimisation, screening and signalling

The economics of information analyses the influence of information on the decision-making process and aims to identify the optimal type of information. Within this research field, an important focus lies on the information asymmetry that refers to the fact that one market actor is more or better informed than the other. The economics of information regard signalling and screening as solutions: To lower existing imperfect information and raised uncertainties, the consumers (as worse informed side) can gather information actively and thus assess product attributes by own inspection and observation (screening). But one disadvantage of screening is that high information costs have to be taken on being able to decode all the offered information (e.g. nutritional facts, health attributes). Due to the information overload and the increasing time pressure many decisions are made directly and briefly at the point of sale. According to Stiegler the main cost of information is time (Stiegler, 1961). Other factors contribute also to explain consumers' reluctance towards information processing and rational decision-making like facing irrelevant or useless information that doesn't fit their needs and the limited human cognitive ca-

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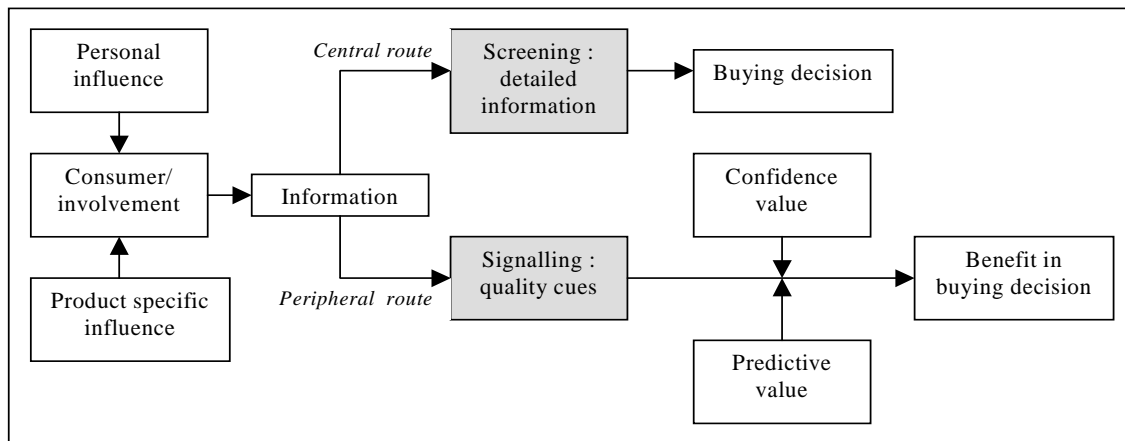
capacity. In some cases, it may even be perfectly rational for consumers to remain imperfectly informed. This refers to the 'rationally ignorant' consumer hypothesis (McCluskey and Swinnen, 2004) i.e. even when information is free, consumers may refrain from acquiring more information because the price of information processing is too high compared to the marginal expected benefits from information, hence constraining people's motivation to process information (Verbeke *et al.*, 2007). In some other cases, consumers use their emotions or feelings as heuristics to make faster effective decisions in complex or uncertain situations.

Next to the screening, the signalling is another option of information usage. Signalling means the activities of the suppliers (as better informed side) offering quality indicators to consumers. The producers can inform for example with advertising about the product's positive impacts on health (Kaas, 1991). As compared to other food/consumer policy measures, this option has a direct impact on consumer decision-making. The provided information may increase consumers' welfare by protecting them and enabling choice to be better in line with their preferences. Still, they need to know what label cues are of interest to consumers. Verbeke and Ward (2006) demonstrate that there is a difference between the importance and the attention that consumers link to a cue; this indicates that consumers may recognize the importance of a cue but still pay less attention to it and put in evidence the selective nature of attention.

The so called "information chunks" or "quality cues" refer to instruments that are very important for the product identification and its quality estimation; they include and respectively substitute many other information, but only under the condition that there's a reliable relation between the information chunk and the integral evaluation of an object. For instance, brands are a special quality cue that makes easier decision-making and reduces consumer uncertainty. A satisfactory quality normally paves the way for the repurchase of the branded product. Unbranded products like fresh meat, fresh fish, fruits and vegetables make it much more difficult to form quality expectations. When products are unbranded, quality/origin labels can give consumers another means of inferring experience (Grunert, 2002). Uncertainty and perceived difficulty to evaluate quality and safety increase consumers' usage of extrinsic quality cues (Verbeke and Ward, 2006).

The many labels available on the markets give the impression that they contribute to the information overload than instead of offering orientation in buying decisions. Labels proliferation lead to consumers' confusion and make it harder for them to gain their recognition and reputation (due to the crowded field) and it also give more opportunities for frauds. The theoretical framework of the "cue utilisation theory" replies to the question, why some signals are preferred to others. According to this theory, the "confidence value" and the "predictive value" of a signal are responsible for the ability, to be considered in the buying decision process (see Figure 1).

- The *confidence value* describes, to what extent the consumer can be sure, that the association connected with the attribute is really correct. One precondition for the working of the signal is first of all the correct identification, in which direct readings of e.g. the origin, facilitate the information search process. Next to the correct identification of the label, the confidence value applies to the perceived credibility of the signal.
- The *predictive value* means the ability of a signal, to reduce the uncertainty connected with the buying decision. It represents the strength between the signal and the quality estimation. If an attribute awarded a high predictive value then it has the potential to induce associations (e.g. French champagne).



**Figure 1.** Theoretical framework of information processing (source: authors)

Representatives of the cue utilisation theory explain the following interdependencies: The confidence value is the basis that has to be given, so that the predictive value can evolve its effect. Within a middle or high confidence value the signal gains impact with increasing importance of the predictive value (Cox, 1962).

In recent years, there has been a proliferation in quality labels and combined origin/quality labels. The responsible partners and owners of the labels can be groups of manufacturers/producers, retailers, regional authorities, national agencies, the EU administration or other parties. Unfortunately, many efforts have been disappointing. In consequence, consumers often ignore quality labels due to a lack of knowledge and awareness as well as a misunderstanding and – interpretation (Grunert, 2002). It becomes obvious that the use of information as a risk reducing strategy does not only depend on the single contents of the information, but also on the level of trust associated with the source. In many studies, the hypothesis could be confirmed that public authorities are regarded as most reliable information source within safety and quality aspects of food products (Latvala, Kola, 2003).

### Method and results of empirical study

The purpose is based on the analysis of the verbatim recorded within six focus group discussions carried-out in Germany and France in autumn 2005 which gathered 58 participants, and 83 individual laddering interviews (combined with semi-structured interviewed on the link between quality, safety and authenticity with traceability) conducted during winter 2005-2006. The possible benefits that consumers derive from traceability were investigated by application of focus group discussion and laddering methodology. The acceptability of different traceability systems was measured during focus groups. The results of laddering indicate that health is a central, relatively abstract concept that people link (directly and indirectly) to attributes associated with traceability (e.g. origin of products, production process and production method). Furthermore, safety, quality, control, guarantee and trust were shown to be major concepts in people's perceptions of traceability. These results are common across France and Germany.

#### *Focus group discussions*

Participants perceived the utility of traceability in knowing what they are buying/eating, in having the possibility to have more information on a food product, and especially identifying its specific origin (to have the ability to choose; to avoid products coming from country they would not like to buy products from due to ethical or political reasons). The second more quoted utility is the possibility to withdraw/recall a defected/suspicious product in case of a problem. Even

though some consumers considered that implementation of such system is achievable, they need to know that the information provided will be accurate and credible. Participants insisted on the need of a credible authority to provide such information and to implement traceability in all the companies.

In all focus groups, there were similar statements regarding the reading of labelling on food products. Participants stated that they read labels and pay attention to information provided on them. However, it is often a superficial and fast reading. There was a common complaint about the size (written with very small letters) and clearance of the labelling. Especially the stamp of veterinary identification number of plant is not well perceived by the French participants. In France, traceability is considered as a buying and confidence criterion especially when it is taken as an information provider of the origin, the producers and the ingredients because they have more confidence in a food product that provides this information. While in Germany ability to trace does not influence on participants' purchase. However, the information provided by traced products could increase German consumers' trust.

Participants had different opinions about their willingness to pay for traced food products. In both France and Germany, participants thought that prices are already high enough. But some French ones were willing to pay 1€ more for producers (not traders or shopkeepers). Some differences between French and German respondents were, furthermore, observed. French consumers focused more on quality-related aspects, while German ones emphasized issues related to environmental and ethical factors, such as organic production, the environmental impact of food transport, and animal welfare. An other major difference was shown in the way which has to be used for guaranteeing the traceability along the food supply chain.

#### *Laddering interviews*

Means end chains method was used in order to identify consumers' attitudes and deep values behind the elicited importance of attributes related to food traceability. Attributes were selected from a list of important attributes (as identified by consumers) based on the literature review and the focus group discussions. Attributes represented a wide range of traceability-related concepts, such as origin, production method and process, labelling, brand, authenticity, experience... Local examples of quality labels (e.g. Label rouge), certification label (e.g. fair trade) and safety label (e.g. salmonella free) were given.

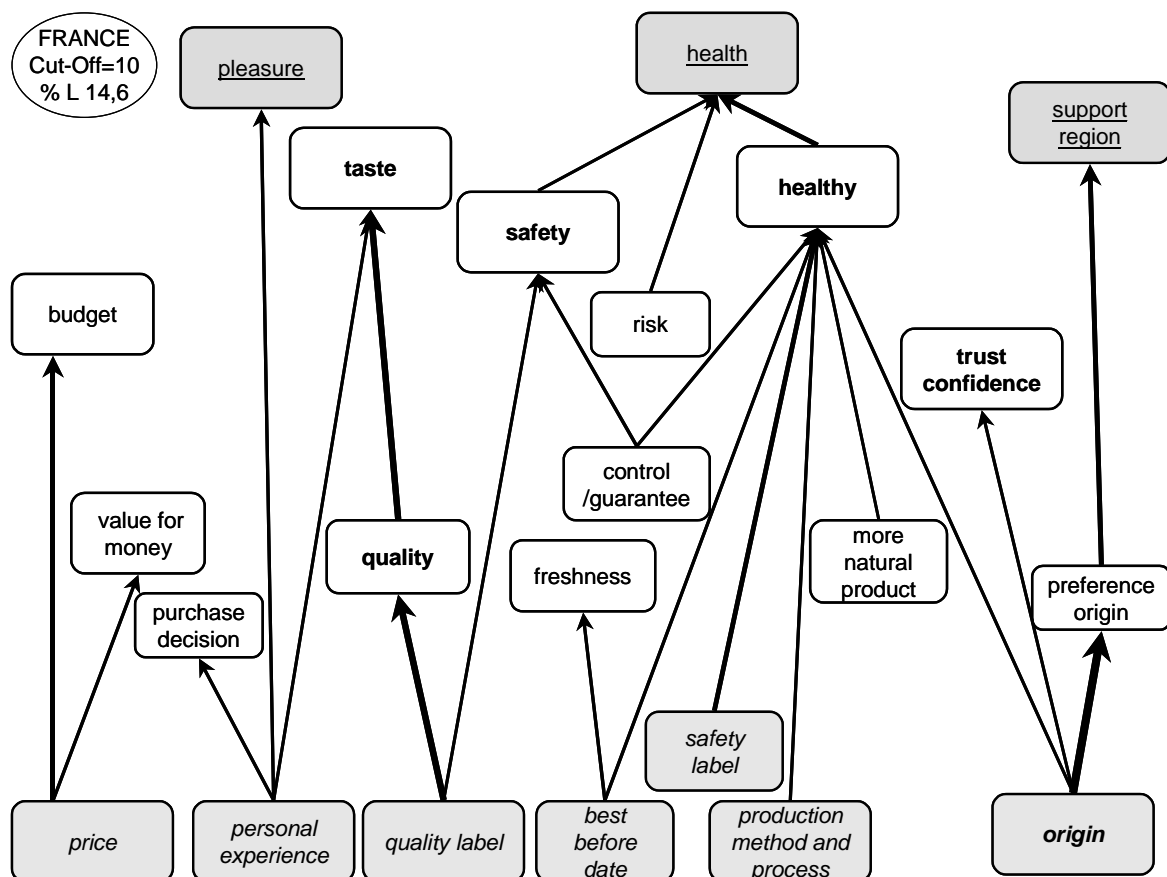
Respondents were asked to indicate how important the specific characteristics (i.e. attributes) are for them in relation to traceability. Attributes were always rated in reference to traceability to ensure that respondents gave judgements of attributes in relation to traceability and not just on the basis of regular purchasing motives.

Ladders were obtained for those attributes rated as most important (i.e. a score of 5; or 4 when no 5 scores were available). When applying the laddering methodology, it is usual for the interviewer to make the final decision about when to stop probing, based on his/her impression of having revealed all the respondents' relevant thoughts.

The Hierarchical Value Maps (HVM) that were drawn on the basis of the laddering interviews showed that attributes related to traceability (e.g. origin, or labels) are associated with the benefits trust and a sense of control; this was linked via quality to safety. The most important benefit that consumers derive from traceability attitudes is health, but some other important and dominant links emerged: i) the link between knowing the production method and process of a product to determine whether the product is more natural (less processed) which was again linked to health; ii) the link between the origin of a product, a preference for products from a particular region as well as the need to give support to the own region. To draw a HVM, a cut-off level needs to be determined; it is the number of times that two concepts need to have been linked to be included in the HVM. The best cut-off level is the level which allows for retaining as much in-

formation as possible, but without losing the clarity of the graphical depiction for interpretation. The cut off level is not the same for France and Germany because there wasn't an equal number of ladders provided in both countries. This can either be due to a difference in consumers' level of elaboration on food related matter, or to interviewer variation.

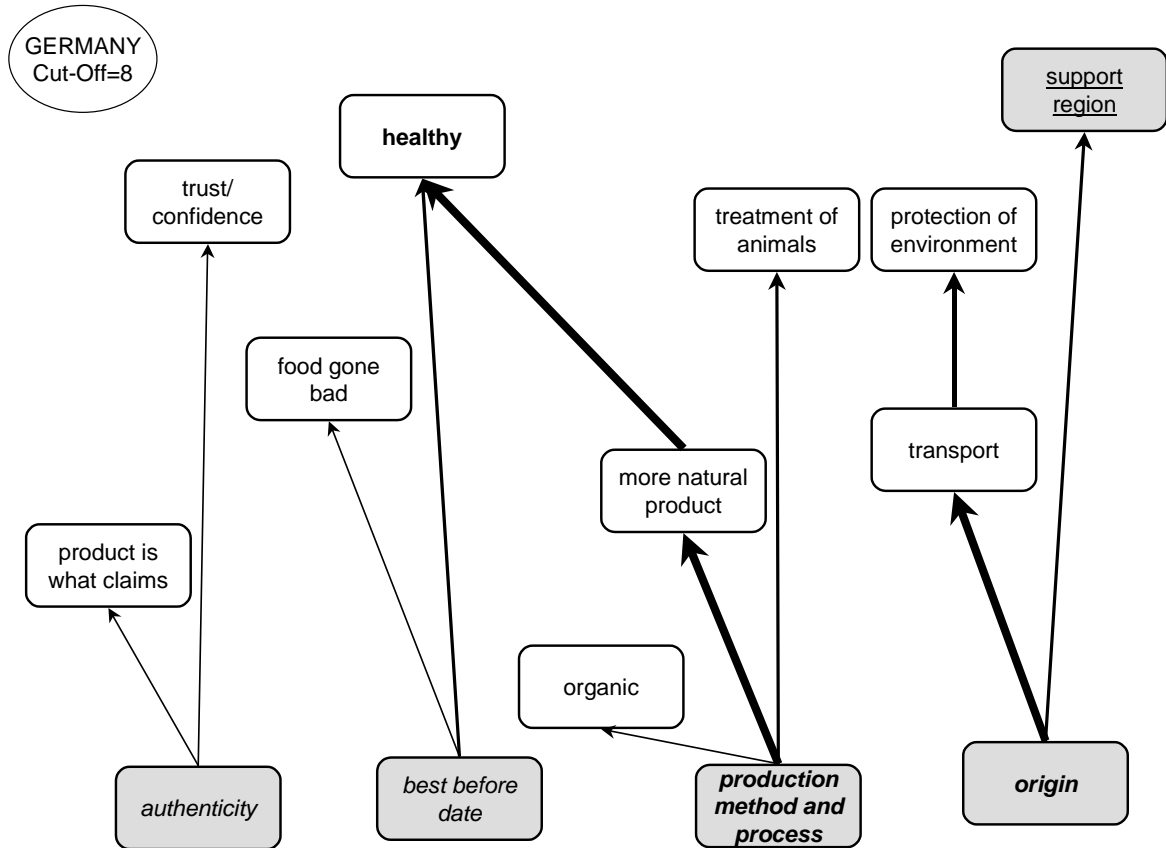
Dominant links that appeared for French consumers were those between quality label, quality and taste as well as safety label and healthy/health (see Figure 2). In addition, there is a strong preference for products from a particular origin (country or region), which is expressed in the preference for products of a certain origin and for reason of supporting the local region. Further links indicate that having personal experience with a product helps making a purchase decision, indicates positive taste (a central concept in France) and provides pleasure. Price is not only important in relation to budget, but people also look for value for money when they consider product prices. However, no positive willingness to pay more for a traced food product was expressed, as traceability seems to be considered nowadays as a basic requirement.



**Figure 2.** Hierarchical value map for *French* sample, with cut-off 10; attributes in light shading, consequences clear and values dark shading. (source: authors data adapted from Rijswijk van *et al.*)

In Germany, consumers linked the origin of products to different methods of transportation, which is important to them because of concerns about the environment (see Figure 3). Another dominant link that appeared was the link between production method and process and a more natural and healthy product. As for the production method and process (which was a central concept here), they are interested to know whether a product is organic or not. This is in line with their shopping behaviour, with a great preference for organic stores among German consumers. In addition, the production method and process are important in relation to the treatment

of animals. Furthermore, the authenticity of the food products was considered an important attribute. When a product is authentic people perceive that this product is what it claims to be and the information about this product is honest. An authentic product also gives them more confidence in the product. For German respondents, both quality and safety do not appear as separate concepts.

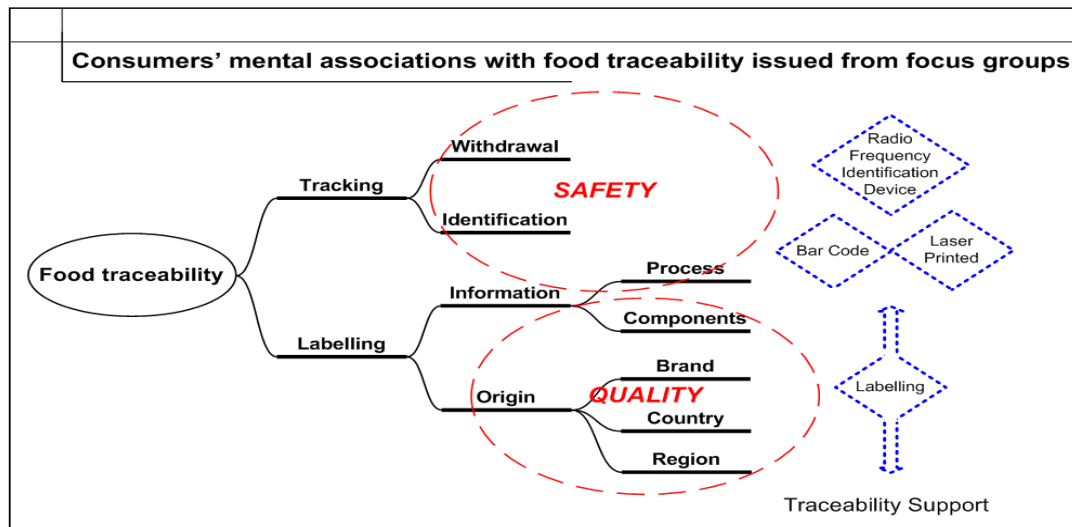


**Figure 3.** Hierarchical value map for *German* sample, with cut-off 8; attributes in light shading, consequences clear and values dark shading. (source: authors data adapted from Rijswijk van *et al.*)

### Discussion

It is first interesting to see how developed are the mental associations when consumers focus on concrete utility of traceability, and how short they are when participants to focus groups think about technical traceability (see Figure 4).





**Figure 4.** Consumers' mental associations connected with food traceability (source: authors)

Consumers' perception of food traceability is likely to be driven by signalling route, not by screening. The more abstract the traceability support is, the more complex and risky traceability seems to be perceived by consumers, and sometimes rejected. According to the incorporation principle, consumers are reluctant to agree with innovation inside food, and possibly accept it around food. This statement seems to be extended to food traceability, according to the results obtained during the six focus group discussions carried out.

On the other hand, 10 years after the first BSE wide-Europe crisis, consumers look familiar with food crises and seem less afraid than expected, whilst still concerned by food issues. During, or just before the period of focus groups, some of the studied countries knew minced beef withdrawal campaign, or chicken meat infection affair. All of our participants to discussion were aware about first insights of bird flu in autumn 2005. Even when using meat as an illustration, the discussion has never shown more concerns about food scares than usually. However, this experiment was just focus group discussion, which is not, *per se*, quantitative.

The main issue elicited by focus groups participants was about food safety, both expressed in positive (*confidence, trust, guarantee, withdrawal, ...*) or negative concerns (*food crisis, BSE, GMO's, unknown origin, ...*). In most cases, efficient traceability was also expressed as a basic requirement with good value for money applied to food purchases. In some cases, a negative willingness to pay more for traceability was clearly expressed. These two critical utilities are the starting point of thought process linked to food traceability, according to consumers' verbatim. Then convenient side of healthy food was expressed, with links often elicited to nutrition and components information. Thus, pleasure linked to food experience was not forgotten and several participants expect tasteful food, without any trade-off envisaged between taste and safety, due to the awareness of traceability presumed efficiency. Logically this statement leads to the expectation of identified origin of food products, expressed as the last stage of utility linked to traceability.


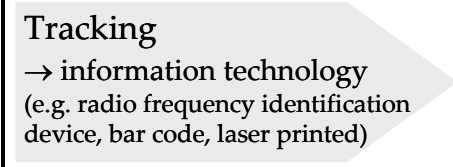
Importantly, overall, the results from laddering interviews showed that consumers perceive both safety and quality as related to traceability, in congruence with results from focus groups (Rijswijk van *et al.*, 2007). Although respondents relate traceability primarily to safety (and recall in reaction to safety problems) it is also related to quality. Consumers' definitions of quality and safety partly overlap. For many people safety is one aspect of quality, and therefore finding a product that is of high quality means finding a product that is safe. Hence, this implies that when consumers indicate that quality is an important aspect in their perception of food they implicitly

include safety as well. Then the reverse does not hold: safety seems to be a basic requirement for quality without necessarily implying it. Interestingly, people indicate that they based their food choice in the shopping environment more on their quality perception because they believe they cannot themselves assess the safety level of a product, or believe that all products available on the shelves are safe. Respondents did associate authenticity with traceability. Authenticity was generally perceived as an important attribute and people's predicted responses to detecting fraudulent products were strong and actions ranged from discontinuing buying the products and filing complaints with authorities and retailers.

### Conclusion and managerial implications

All this clearly indicates that, while supply-chain actors have a perception of traceability oriented by ontology, consumers have a more end-users oriented perception of food traceability, based on teleology. Consumers don't easily understand what are traceability systems, but clearly express what are the benefits they're willing to take from it (Giraud and Halawany, 2006). As a result of the analysis of the whole verbatims collected in the three experiments, it became obvious that there are two branch connections starting from the traceability concept, a technical one called "Tracking" and a communicational one called "Labelling". It is interesting that there are only rare associations that are linked to technical aspects. The bottom line is that all those attributes are in the range of safety issues (see Table 1). The Labelling concept is - in contrary - well arranged. Information about the process and product components, but also specifications within the brand and the country of origin are considered as quality aspects. It can be subsumed that consumers have a more end-user oriented perception: they don't easily understand what traceability systems are, but clearly express the benefits that can be expected. The main issue for an increased acceptability of modern food traceability systems should be to offer reliable and simple communication patterns, incorporating high tech standards for identification.

**Table 1.** Communication ways regarding traceability related issues (source: authors)

Communication instruments	Traceability related issues
 <p>Signaling / Labelling</p>	<p><b>Quality</b></p> <ul style="list-style-type: none"> <li>▪ food components</li> <li>▪ brand</li> <li>▪ country / region</li> <li>▪ process</li> </ul>
 <p>Tracking → information technology (e.g. radio frequency identification device, bar code, laser printed)</p>	<p><b>Safety</b></p> <ul style="list-style-type: none"> <li>▪ withdrawal</li> <li>▪ identification</li> <li>▪ process</li> </ul>

In their study, Verbeke and Ward (2006) show that consumers are not interested in cues directly related to traceability and product identification while they pay more attention to other cues like readily interpretable indications of quality as well as for mandatory standard information (e.g. expiration date). Therefore, even if traceability information is useful for legal purposes, it does not necessarily to be predominant on the label. They also proved that there is a positive effect

of an information campaign with the following cues: country of origin, quality guarantee and quality label cues. This puts in evidence the clear need to assist consumers in understanding the information presented on labels and the difficulty in convincing the consumers that there is potential value from other types of information placed on labels.

Paradoxically, any more complex system of food traceability seems to introduce more doubt and question rather than confidence and clarity, according to the principle of incorporation. Finally, the improvement of food traceability in Europe could be easier if well documented on communication and advertising campaigns. The main consumers' expectations for future traceability do not seem to encourage technological complexity of supply chain organisation regarding traceability. In this case of little perceived interest of the consumer in traceability codes, the information campaigns must be based more on safety and product recall issues with a health claim than on helping consumers making informed decisions.

Although some difference exists between France and Germany, there is a huge congruence of responses towards a clear feature: Consumers are still not ready to accept sophisticated systems and supports of traceability. They need to be informed more and to be more in touch with what is happening on the markets. There is a huge work to do to communicate more with the consumers and to create links between producers, technicians and consumers. According to our findings, traceability should not be implemented in a pure technological manner, but should take into consideration consumers' expectations towards simpler and more reliable systems. Not surprisingly, food traceability improvement may be strongly linked to communication rather than to technological investment. Developing certification standards, monitoring of the various stages of production and product custody, traceability/tracking systems, and related labelling schemes can turn a previously credence attribute into a search attribute that the consumer can evaluate prior to purchase by reading the label and using related information (e.g., brochures, websites). The market and trade impacts of certification and labelling programs depend directly on the source and design of the labelling program (Casewell, 2006).

Food processing companies should not consider traceability as an economic burden but can see in it an opportunity for system growth. The main issue for an increased acceptability of modern food traceability system should be to offer reliable and simple systems, incorporating high tech standards for identification and easily intelligible outcomes of traceability.

## References

- Casewell, J.A. (2006). Quality assurance, information tracking, and consumer labelling. *Marine pollution bulletin* 53: 650-656.
- Cox, D.F. (1962). The measurement of information value: A study in consumer decision making, in W.S. Decker (ed.), *Emerging concepts in marketing*, American Marketing Association, Chicago.
- Giraud, G. and Halawany, R. (2006). Consumers' Perception of Food Traceability in Europe. 98<sup>th</sup> EAAE Seminar, Marketing Dynamics within the Global Trading System, Chania, Greece.
- Grunert, K.G. (2002). Current issues in the understanding of consumer food choice. *Trends in Food Science and Technology* 13: 275-285.
- Kaas, K.P. (1991). Marktinformationen: Screening und Signaling unter Partnern und Rivalen. *Zeitschrift für Betriebswirtschaft*. 61: 357-370.
- Latvala, T. and Kola, J. (2003). Impact of Information on the Demand for Credence Characteristics. *International Food and Agribusiness Management Review* 5.
- McCluskey, J.J. and Swinnen, J.F.M. (2004). POLITICAL ECONOMY OF THE MEDIA AND CONSUMER PERCEPTIONS OF BIOTECHNOLOGY. *American Journal of Agricultural Economics* 86(5): 1230-1237.

- Rijswijk, W. van, Frewer, L., Menozzi, D. and Faioli, G. (2007). Consumer perceptions of traceability: A cross national comparison of the associated benefits. *Food Quality and Preference*, forthcoming, 23 p.
- Stiegler, G.J. (1961). The Economics of Information. *Journal of Political Economy* 69: 213-225.
- Verbeke, W. and Ward, R.W. (2006). Consumer interest in information cues denoting quality, traceability and origin: an application of ordered probit models to beef labels. *Food Quality and Preference* 17: 453-467.
- Verbeke, W., Frewer, L., Scholderer, J. and De Brabander, H. F. (2007). Why consumers behave as they do with respect to food safety and risk information. *Analytica Chimica Acta* 586: 2-7.



