

# How is Modernity Accepted by Consumers with Respect to Traditional Food Products? The Case of Traceability

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**Abstract—** Up till now, no researches have been done on consumers' acceptability of new technical supports of traceability, especially for traditional food products. Therefore, in the framework of the EU research project TRACE, we carried out focus group discussions, individual laddering interviews (with hierarchical value maps) and a choice-based conjoint experiment. Traceability is a fashionable word with different meanings whether it comes to producers or to consumers. The formers link it to technical aspects while the latter see in it a path for safe and good quality food products. How to intersect these two dimensions when advertising trend and consumer expectations are focusing on traditional food products? In France, consumers are familiar with the word traceability, however, they are not aware of the new supports of food traceability. They are still not ready for sophisticated systems and prefer the labelling ones. The more abstract the traceability support is, the more complex traceability seems to be perceived by them. Interestingly, we questioned consumers on traceability supports, they mainly responded on origin and label of origin as a simple way to track food products. This indicates that traditional origin labelled food products are considered as naturally tracked, while industrial products are perceived to come from a less identifiable source, and are better accepted with the guarantee of brand.

**Keywords—** Traceability supports, traditional, consumers.

## I. INTRODUCTION

Recurrent food scares proved that the identification of the origin of feed and food is essential for consumers' protection. The Regulation (EC) No. 178/2002 of the European Parliament made food traceability obligatory in all food businesses at all stages of the food chain since January 2005 in order to ensure a better level of health protection and an effective functioning of the internal market.

Traceability is a fashionable word that has different representations whether it comes to producers or to

consumers. The formers link it to technical aspects while the latter see in it a path for safe and good quality food products. How to intersect these two dimensions when both advertising trend and consumer expectations are focusing on traditional food products?

Traceability does not itself make food safe. It is a risk management tool that contains/moderates a food safety problem by facilitating the withdrawal of food and enabling consumers to be provided with targeted and accurate information concerning implicated products [1]. All food business operators have a legal responsibility to develop systems of traceability designed in relation to the nature and the size of their activities and to implement a recall system. These systems will help them to better target the withdrawals, which will save costs in terms of time and money. In addition, they will guarantee food safety and reliability of the information provided to consumers. However, the type of the traceability systems was left upon the choice of the business operator.

Modern technologies are being incorporated to cope with the increasing complexity within the agro-food industries. Consumers are more or less familiar with the new supports of traceability. The most known ways of communication so far are bar codes, labels (seal/logo), certification (stamp), information in the store, phone number of the producer or the company, and recently Internet (websites). Therefore, it is important to investigate consumers' perception of new systems of traceability. Since it is more logical to treat issues of consumer acceptance during product development rather than try to develop campaigns to force consumer acceptance once novel products are already on the market [2].

## II. METHODOLOGY

During 2005-2006, in order to explore consumers' perceptions about food traceability as well as their

acceptability of new technical supports of traceability, and in the framework of the EU research project TRACE, we carried out 3 focus group discussions dealing with the following themes:

- General habits related to food plus quality and origin labels perception.
- Traceability, its definition, utility and perception.
- The new supports of traceability related to food (i.e. labelling for non-packaged fresh products, bar code for fruits or vegetables, laser printed information, and Radio Frequency Identification (RFID) tags).

The focus groups were followed by 43 individual laddering interviews. Laddering technique aims to unravel the importance people link with certain attributes of a product. It is based on means-end theory [3, 4], which aims to understand consumer decision making by revealing the prominent choice criteria for consumers. Means-end theory distinguishes three levels of knowledge related to a product: attributes, consequences, and values.

Laddering consists of three stages, namely the elicitation of attributes, the interview to obtain ladders from respondents and the data analysis. For the selection of attributes, we based our choice on the most cited terms associated to traceability during the focus groups and on the literature review. 15 attributes<sup>1</sup> were kept for the interviews and participants were asked to rank them on a 5-point Likert scale with 1 being “not important at all in relation to traceability” and 5 being “very important in relation to traceability”. The most important attributes (score of 5; or 4 in case no 5 scores were available) were then used in the laddering interviews to obtain the ladders by asking participants “Why is this attribute important to you?”. Hierarchical Value Maps (HVM) were drawn on the basis of the laddering interviews; they show to what final benefits or values, attributes related to traceability are associated with. Finally, using the results of both focus groups and

laddering interviews, a choice-based conjoint experiment was realized to find out which attributes are important to consumers’ final choices.

The experiment was applied on two products: chicken and honey, the former is a product of a higher frequency of consumption (therefore buying) than the latter. Eight attributes with their levels<sup>2</sup> were kept for the experiment. The levels of each attribute were chosen to be mutually exclusive. An orthogonal fractional factorial design produced 32 scenarios/cards (with 3 alternative products each and a no-choice option). To reduce the confusion and/or tiredness of participants, these choice alternatives were grouped into 4 groups of 8 cards each and every participant is successively assigned one of the 4 groups.

Overall, 28 participants were recruited for the focus groups, 43 for the interviews and 297 for the choice-based conjoint experiment (140 for honey and 157 for chicken) with a good balance of age, gender - even though women seemed to be more interested in this kind of group discussion especially when the topic is about food -, professional status and educational level. For the laddering interviews, due to the complexity of the applied method, participants were more of a high level of education. The only two conditions to be recruited were to have 18 years old or more and to be the person responsible for household food purchases.

### III. RESULTS

#### A. Focus groups results

Perpetual food crises modified consumers’ food consumption and pushed them to look for detailed information about the products they desire to buy. For most of the participants of the focus groups, reading food labels has become a habit precisely when buying a new food product. Consumers look for some information about a product before buying it, notably the composition, the origin, the price and the freshness [5]. During the focus groups, participants chose origin

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1. Best before date, geographic origin, authenticity, safety label, method of production, certification label, quality label, personal experience, EU origin label, level of processing, pre-existing knowledge, price, unique identification number, brand, possibility to have additional information about the product.

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2. Country (no, domestic, imported), brand (no, retailer, big national, local), region (no, yes), ways of communication (no, Information Technology based, written information), seal (no, yes), information on production process (no, yes), certified by (no, industry/retailers, third party/independent, public authority -government, EU-), and price (5 levels).

and price as the most important information for a food product. The importance of attention paid to the brand depends on the type of the food product. Origin is considered as a reassuring attribute for them. It is connected to emotional values and holidays' memories. However, with the globalization, the image of the origin has become more complex [6]. The origin is not considered alone but with the other attributes, its importance being more raised when the other attributes are absent [7].

Concerning food labelling issues, three contradictory feelings were recorded: disinformation, over information, and misinformation. In other words, there is an information asymmetry between producers and buyers. Therefore, participants want to find quality guarantees to base their confidence in. Branding and labelling may be the remedy for information asymmetry only if the consumers feel that they have total certainty over attribute claims made in the production process [8]. The knowledge of labels by the consumers and their signification are very vague, certainly because of the big variety of labels on the market which pushes the consumers to express their distrust to the promises of certain labels [9].

Rural development is progressively gaining more and more territory due to the policy adopted by the EU, which stresses the importance of supporting typical products. Typical or traditional products are strictly tied to their area of origin as they derive their characteristics from the peculiarities of the "terroir" they come from [10, 11]. The use of a designation of origin or region in food business is playing a key role in the success of differentiating strategies especially that consumers appear to value the authenticity of these labelled foods. The results of the focus groups showed that origin labels are well perceived by consumers because origin can influence differently the evaluation of a product and because of participants' perceived importance of local origins.

Traceability does not mean the same thing for all the consumers [12]. It evokes more safety than quality.

Focus groups' participants had a good knowledge of what traceability is. They mostly linked it to the origin and the provenance of the product. Different levels of traceability were expected according to the type of products. Participants want to have precise information about origin, ingredients and composition.

They feel that they are not sufficiently aware about traceability. Nevertheless, in general, they think that traceability of food products with origin and quality labels is better and is more guaranteed. Traceability is associated to the labelling [13], which the consumers want with clearer information and less charged. For participants, traceability should be a basic requirement and not necessarily highlighted or visible. They want the strict minimum information with a kind of guarantee label.

Finally, participants were shown six pictures of food products carrying four different supports of traceability:

- Labelling for non-packaged fresh products (Fig. 1)



Fig. 1 Labelling for non-packaged fresh products

All participants noticed the "Label Rouge" on the fish but none of them were willing to eat the fish because the labelling is directly stuck on it. For them, "Label Rouge" implies a good quality product with better controls. As disadvantage of this support, participants mentioned the absence of important information (e.g. the fishing date, the type of fish) and the fact that the label can be removed easily, which encourage frauds.

- Bar Code for fruits or vegetables (Fig. 2)



Fig. 2 Bar Code for fruits

Participants had negative impression about this support '*It is weird*'. They were wondering about its

utility as they cannot read a bar code and about the kind of information that will be available. In general, they all prefer the traditional labelling and privilege their regional products. Moreover, when asking them about their opinion on the ability to scan this product at home using the Internet, they were all against it.

Still, two advantages were found in this support: it limits the frauds because it cannot be modified or moved and it is ecological because there is no plastic cover.

- Laser printed information (Fig. 3 and 4)



Fig. 3 Laser printed information

The first thing the participants noticed on the pear (Fig. 3) was the word “USA” and it was directly negatively interpreted because of their attachment to national and regional products. Apart from the origin, they felt that it’s a shocking technology, scary, bothering, useless and not attractive at all. Just one person was OK with it, only knowing that a pear can be peeled. Either ways, participants couldn’t find any benefits to this support.



Fig. 4 Laser printed information

Concerning the egg (Fig. 4), participants were already used to this type of labelling for eggs and they

do accept it well especially that eggs are not eaten with their shells.

- Radio Frequency Identification (RFID) tags (Fig. 5 and 6)

RFID technology is an automatic identification method, relying on storing and remotely retrieving data using devices called RFID tags. An RFID tag is a small electronic chip that can be attached to or incorporated into a product or animal. These tags contain antennas to enable them to receive and respond to radio-frequency queries from an RFID transceiver.

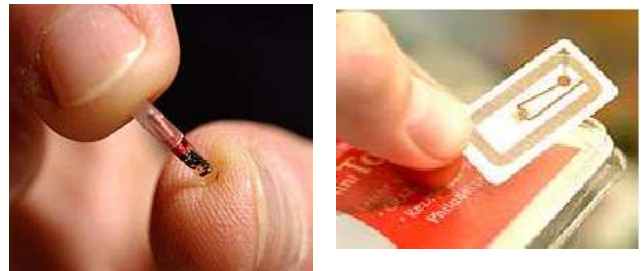


Fig. 5 & 6 RFID tags

After explaining the concept of this support, participants started wondering about the individual liberty, freedom and privacy; one of them even said ‘*They will follow us till our fridge!*’. They are sceptical about it, even if they have the opportunity to turn it off after buying it. For them, it is useless, very sophisticated and expensive. The only advantage found for this support is to help enterprises having a better stock management.

Not all the participants were excited about the idea of these new systems and new technologies of traceability. They want to keep the good old way of labelling and to return to confidence notion.

### B. Laddering Results

When choosing a food product, consumers look for certain features to help them in their decision-making. In this study, we are specifically interested in the product features consumers find important in relation to food traceability. For the respondents, the most important attributes are: 1) best before date, 2)

personal experience with the product and price, 3) geographic origin and method of production, followed by quality label, authenticity and safety label.

Using attributes with the highest means, hierarchical value map (HVM) were drawn. The dominant links are: price with a budget consequence and also for value for money, quality labels with quality and taste, finally origin with a preference of own origin and for the support of region. In conclusion, the main values participants link to traceability when choosing their food products are: pleasure, health and support of region.

### C. Choice-based conjoint experiment

32 scenarios with 3 alternative products (and a no-choice option) were presented to participants so they choose the product they most prefer. Thus, the participants form the utilities of these 3 products:  $u_1, u_2, u_3$ . The most preferred product is the one with the highest utility. The calculated estimated utilities  $\hat{u}_1, \hat{u}_2, \hat{u}_3$  show the following attributes or levels as significant for both traceable chicken and honey: domestic product, local brand, major brand (not for honey), known region, IT information, written information, seal, information on production process, certified by industry, certified by independent, certified by public authority and price. The three most important attribute's levels for the choice of a traceable chicken are national product, major national brand and certified by a public authority. As for honey, they are national product, certified by a public authority and information about production. The results of the experiment show that there is a clear preference for domestic products (chicken and honey). As expected, the price is negative and statistically significant. This shows that when the price increases, the utility of the chicken and honey, even with traceable characteristics, decreases.

As an overall conclusion, consumers seek traceability in chicken through brands clearly preferring the national products with a certification by a public institution. For honey, they look for information about the country-of-origin with a strong penchant to domestic products certified by a public institution. In addition, they accord a big importance about the production process information of honey.

The name of the region has shown small utility for both products with a higher importance associated to honey. This information should be communicated to participants in a written way for chicken and in an IT form for honey.

## IV. CONCLUSION

With respect to traceability, consumers distinguish between functional and process attributes. The former refer to the intrinsic opportunities of the systems like chain monitoring, and the latter refer to characteristics of the production process at different levels of the chain [14]. Consumers can speak lengthily about food traceability when they focus on the concrete utility of it, while they can barely mention two words about its technical aspects. They don't easily understand what are traceability systems, but clearly express what are the benefits they're willing to take from it. The more abstract the traceability support is, the more complex and risky, traceability seems to be perceived by consumers. According to the incorporation principle [15], consumers are reluctant to agree with innovation inside food, and possibly accept it around food. The main issue for an increased acceptability of modern food traceability systems should be to offer reliable and simple systems, incorporating high tech standards for identification and easily intelligible outcomes of traceability.

The experiment of showing participants new supports of traceability prove that consumers are still not ready for this kind of sophisticated systems. They need to be more informed. Here, there is a huge work to do in communication with consumers. Consumers' interest in food traceability does not necessarily mean that consumers wish to be overloaded with additional information about their food products. As it was shown in the laddering results, when communicating about possible benefits of traceability for consumers, health should be the central theme together with quality and safety guarantee. This will increase consumers' confidence. The absolute minimum level for traceability seems to be origin, brand, information about production methods and certification. Given the importance that consumers attribute to product labels, in combination with the need for concise information, a logo that indicates traceability with backup

information on the Internet for interested consumers with a certification from a public institution might be an interesting way in which the information needs of consumers can be fulfilled. A good implication could be for producers of traditional food who may review their commercialisation strategies by adding a public institution certification to their labelled food and by working on their communication schemes. These findings must help producers and advertisers when implementing a traceability policy for their food products or those who support traditional products to improve their strategies.

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