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Quality related communication approaches for organic food

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Paper prepared for presentation at the 98th EAAE Seminar ‘Marketing Dynamics within the Global Trading System: New Perspectives’, Chania, Crete, Greece as in: 29 June – 2 July, 2006

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Abstract. As food quality becomes more complex, consumers are tending to reduce their involvement in the food purchase decision-making process. Consequently, prices are becoming more significant as they represent an easy choice criterion when consumers have less information about the differences between the product and process quality inherent in food items (including environmental or social issues).

The organic food sector provides high, complex food quality profiles and has therefore been seriously affected by this development.

Consequently some SMEs in the food business sector are starting to emphasize certain quality factors, such as sustainable production and processing, as a means of communicating their added value to consumers.

Based on published scientific and unpublished literature, this paper provides an overview of the main instruments and media of communication on food quality, illustrated by case studies. It also presents the results of a test by means of an information display matrix, conducted in order to analyse the consumer information and quality assessment behaviour involved in apple purchase in Switzerland.

Keywords food quality, food indicators, means of communication, food miles, social standards, consumer behaviour.

1 Introduction

Recent experience indicates that consumers are willing to pay higher prices when the quality standards behind products are transparent and visible. Consequently, the first small- and medium-sized enterprises (SMEs) in the food business sector have started to implement business to business (B2B) and business to consumer (B2C) communication tools, based on existing traceability systems, which provide more transparency about the product and process quality behind the food.

The modern consumer is more patchwork than uniform, and modern food choices are characterized by buying patterns that are inconsistent or subject to frequent change. Often, the inability to assess information about the actual product and process quality is the main reason behind this, combined with a lack of involvement in food purchase decisions in general.

When adopting product-based strategies, consumers should be able to recognize that price differences indicate a higher quality level than alternative products [1]. Quality is assessed in terms of consumers' and society's technical, psychological and aesthetic expectations being satisfied, and seen as being linked to expectations surrounding the shared values of the product and its production process [2].

To a certain extent, consumers tend to rely on product price, although this is an indirect source of information, as well as basing their purchases on previous experience. They also sometimes rely on controllable factors which, although not themselves indicators of quality, are nevertheless reasonably reliable proof of these [2].

Less well-informed consumers also tend to choose poorer quality goods than they would if more information were available to them [3]. Moreover, less well-informed consumers tend to purchase smaller quantities of goods if their quality is uncertain [4].

Economic theory and empirical analysis both demonstrate that price is a quality indicator, especially where consumers have incomplete information [5].

2 Approaches and indicators to define food quality

Food quality communication can be divided into the communication of quality indicators which are intrinsic (nutritional content of food) or extrinsic (typically price). The consumer's purchase in a context of incomplete information is more influenced by extrinsic attributes than intrinsic ones [6]. Food quality also can be indicated by product-oriented (physical-chemical characteristics), process-oriented (pesticide and additive free) and consumer-oriented (perceived quality) parameters. Whereas the first two of these three approaches are controlled by quality and certification systems, consumer-oriented quality is influenced by more subjective factors. Since the 1960s, food quality has been defined not as merely product-specific but as a consumer's decision on and concern for the whole process [7]. The nutritional value of food products is of major concern to consumers; however, food quality and nutrition also have a cultural dimension which depends on society's value system.

Meier-Ploeger [8] considers six criteria for defining food quality: natural, functional, biological, nutritional, sensorial and ethical attributes.

Within the quality categories introduced by the European Union, known as PDO (Protected Designation of Origin), PGI (Protected Geographical Indication) and TSG (Traditional Speciality Guaranteed), farming and/or processing practices are present as quality parameters.

The EU's OMIaRD¹ project has detected increasing interest among consumers in food quality and in product and process information with regard to organic food. Consumers were interviewed as to their motivation for buying organic products. Health, animal welfare, food as enjoyment and support for environmental protection were the most frequently-quoted factors. Nevertheless, the main barrier to buying organic food is the perceived mismatch between the high prices charged and what many consumers consider to be limited added value [9]. The current practice of making product declarations which often provide less and misleading information doesn't help consumers gain a full awareness of the quality distinction between standard and organic foods.

By means of communications, consumers are able to learn about intrinsic product characteristics, the positive consequences of certain quality parameters and the business behind a product [10].

We focus below on process-related quality indicators. These are gaining increasing importance in the eyes of consumers and society, as the agri-business sector does influence ecological and social issues in many ways [8].

Food miles and energy use

Food miles are the distance food travels from farm to plate. The concept of food miles underlines the costs of transport in economic, social, and environmental terms. As a relative indicator of the amount of energy or fuel used to transport food, it can be quoted as greenhouse gas (GHG) emissions or as a weighted average source distance (WASD), which combines information on the distance from producer to consumer and the amount of food product transported [11]. Schlich and Fleissner [12] found that the efficiency and logistics of a company's production and operations are the main factor in determining energy turnover.

Usually, consumers assume that the regional production and consumption of food require less energy than global food distribution. Regionalism is therefore touted as a solution to energy wastage. The energy turnover of comparable food items can be measured using a lifecycle assessment for the food (LCA). However, von Koerber [13]

¹ Organic Marketing Initiatives and Rural Development (QLK5-2000- 01124)

remarks on the lack of empirical data to support the conclusion that, on average, shorter distribution distances for food imply lower emissions and therefore less environmental impact, or make better economic sense.

Rubik and Frankl [14] propose the implementation of Environmental Product Information Schemes (EPIS) as a means of quantifying environmental information and Environmental Product Information (EPI) as an instrument which also includes energy use. Reinhardt [15] points out how packaging contributes to the energy turnover of food. The use of a paper bag at the baker's or a plastic bag at the factory tend to decrease the disadvantages of baking bread at home instead of buying bread from industrial/semi-industrial production. Modern food systems are energy-inefficient, since they are dependent on oil and contribute unnecessarily to carbon emissions.

Regional and local origin of food

Many consumers are interested in local foods because of the perceived benefits of freshness, stronger taste and higher quality [16] [17]. Regional products are of better "emotional quality" than products of other or unknown origin. By labelling them with their origin, products are positioned emotionally like brands. When they perceive regional quality labels, the origin cue is more important than the quality cue for many consumers [18]. Furthermore, local production entails a feeling of security and of belonging to the local area and its traditions [17]. According to the needs hierarchy of Maslow, short distances allows consumers to fulfil not only nutritional needs, health and taste (on the base level of the pyramid), but also hierarchically higher needs, such as nutritional concerns (about chemical residues), transparency (traceability and origin), political ideals (buying national products, non-polluting production) [19]. The Taurus Institute and the Wuppertal Institute cite the tremendous growth in regional food markets over the last 10 years.

Organic process quality of food

The organic system is more energy efficient to the farm gate, but less so when it goes global [20]. However Stolze *et al.* [21] reveal that energy efficiency, calculated for annual and permanent crops, is found to be higher in most cases for organic farming than conventional farming.

Indicators of social, environmental and economic performance, such as food security, greenhouse gas emissions, food miles, farm income and biodiversity highlight this fact. There are many benefits to organic farming, including reduced fossil fuel energy consumption and fewer greenhouse gas emissions. However, these are often overshadowed by the environmental damage caused by long distance transport. Highly processed and packaged organic foodstuffs have an additional adverse environmental impact [20].

Social commitment and ethical trade

To consumers, the way companies make products and the nature of the raw materials used are important, but the company's philosophy and respect for particular ethical principles are also gaining in importance. This pushes companies to value the information available about them as enterprises [22].

Organic agricultural practice has always tried to incorporate social aspects into the concept, for example through employment, regional marketing, equal rights for women, sustainable production, fair trade and rural development. Social standards are included in the IFOAM principles. Besides the formulation of these principles, companies conduct a wide variety of social activities. However, any monitor will need clear and measurable indicators if they are to assess companies' records on social justice or infringements thereof within a reasonable timeframe [23].

As an organic farming association in the United Kingdom, the Soil Association has developed an 'ethical trade' logo. This can be seen as an attempt to follow the IFOAM (International Federation of Organic Agriculture Movements) principles. Similarly, other

individuals and organisations have made an effort towards being socially committed (for example, disabled people and those being treated for addiction have been employed on farms) [24].

According to Wade [25], ethical food is more than just organic food, as not all organic food would fulfil the ethical food criteria: it may not have been traded fairly or might have compromised food security. Thus a conflict emerges. Ethical foods are traded in an environment characterized by economic, cultural and social pressures which are due to the political climate.

3 Approaches to food quality communication with consumers

The extent to which consumers look for information depends on many factors: on their commitment when they purchase products that they perceive as potentially risky (since food products are currently affected by food scares); on individual factors like perceived benefit (meal enjoyment); on the availability of information and on the ease of processing and understanding it [26].

Formally, the means of food quality communication can be divided into two major groups: off-line and on-line instruments. The first group includes sales persons, product flyers, leaflets, posted publicity materials, labels, results of product testing. The latter includes the internet (i.e. Product Code), TV, radio, SMS product information, shopping carts which remember information, interactive information displays at the point of sale (PoS). Both groups include attempts at marketing at the point of sale and at home (see Table 1).

Table 1. Off-line and on-line tools for communication with customers

Off-line communication tools	On-line communication tools
Sales persons Food journals Product flyers Leaflets Product tags Brands, labels and seals	Internet TV Radio Mobile Interactive information display at PoS

The most straightforward way of expressing the concept of ‘quality’ to consumers is through brands, as a tool for differentiating products that can satisfy consumers’ expectations. Constructing a product in consumers’ minds is often supported by means of the brand. Especially where there is a greater distance between consumers and producers, brands can offer consumers a guarantee of production techniques [1].

As human decision-makers, we are limited as to the number of different variables that we can assess at any one time. The work of Miller [27] and others has validated this hypothesis/assumption experimentally and come up with a maximum of five to nine attributes. Fishbein [28] suggests that the number of salient features considered by consumers lies in this range. If we accept that seven represents the average limit of a human’s decision-making powers, then we must conclude that complex quality profiles have to be communicated in a more compressed and consolidated way.

Consumer choice represents the attainment of a preferred optimal situation, given the constraints. A decision making process in which a choice is made involving a restricted number of parameters, after which a further choice is made using another restricted set of parameters, and so on down the line, is necessarily hierarchical, unless it is random. The ordering of the hierarchy determines which set of parameters is considered first, second, and so on [29].

The utility model that best fits the reality of limited information processing ability and the various criteria for the analysis of consumer demand, in the knowledge that choice reveals preference, is one with a mixed structure. There is no hierarchical relationship between the groups of goods purchased, but within each group there is a hierarchical structure so that the final decisions can be made in several stages, each involving a relatively small number of characteristics.

First, consumers assess the characteristics associated with whether the product actually works, then consider those characteristics that make the product suitable for its intended use, and finally they compare details in flavour, convenience and other relevant characteristics. With a pass-fail kind of decision in mind, as implied in the first stage of the scenario described above, a subset of characteristics is checked against a minimum acceptable level and the product is not considered further unless it passes on all counts [29].

4 Case studies of food quality communication to consumers

As recent experience has indicated that consumers are willing to pay more when quality standards behind products are transparent and visible, the first enterprises in the food business sector have started to implement business to consumer (B2C) communication tools. These provide consumers with more transparency concerning the product and process quality throughout the supply chain. Two case studies have been used to document this.

The 'Warentest' and 'Oekotest' foundations, based in Germany, provide examples of (off-line and on-line) communication of complex quality profiles. Both foundations regularly assess the product and environmental quality of numerous food and non-food products. The results of these tests can be used by companies in their communications and in most cases lead to significant increases in sales volume when products achieve positive test results. Products with negative test results usually improve the quality parameters identified as weak immediately (see www.oekotest.de and www.stiftung-warentest.de/online). To date, the 'Warentest' foundation has proved how good products are, and lately it has declared that it is willing to focus attention on the social and ecological issues associated with production, such as child labour and the use of toxic chemicals.



While the previous example illustrates the possibilities for off-line B2C communication, the next example, the 'Nature and More' foundation, has developed a specific tool for on-line B2C communication of the complex quality profiles of organic fruit. Various quality parameters concerning product, social and environmental quality are evaluated regularly and the test results are published at <http://www.natureandmore.com>.

5 Consumer testing using an information display matrix

Based on the findings revealed in the literature that social and environmental quality criteria are becoming increasingly important in consumers' eyes but that consumers' parallel processing of information is limited to a relatively small number of factors, a consumer test in Switzerland is planned in order to explore a practical case in further detail [30]. The test's design is based on the assumption that consumers' requirements for information concerning quality is closely related to their purchase criteria, which differ product by product for organic food [31].

1.1 Methods

To identify relevant quality attributes, superior key quality parameters and suitable channels for quality related information, a test was conducted on 102 consumers in the northern part of Switzerland in September 2005. The participants were interviewed at the supermarket Coö; moreover the interviewees were grouped into different categories according to gender, age, occupation, household composition and income. The study aimed to gain an insight into the scale and content of the information consumers seek in order to make precise purchase decisions, in this case in relation to apples. Test participants were shown the attributes and discriminating attribute levels of a certain number of products in an information display matrix (IDM), as follows (see Table 2):

Table 2. General composition of an information display matrix

Product attributes	Products			
	A ₁	A ₂	A ₃	A _m
E ₁	e ₁₁	e ₁₂	e ₁₃	e _{1m}
E ₂	e ₂₁	e ₂₂	e ₂₃	e _{2m}
·	·	·	·	·
·	·	·	·	·
E _n	e _{n1}	e _{n2}	e _{n3}	e _{nm}

Source: Kroeber- Riel/Weinberg [32]

The test entailed four different apple varieties, which were presented as real products. Eleven attributes were shown within the four given products: type of flavour (sweet, acid, juicy...); variety (Gala, Golden delicious, Topaz, Gravensteiner); price (between 3,60 and 5,50 Swiss Francs per kilo); cultivation system (organic with or without Bio Suisse certification, Eurepgap, low impact system); origin (Switzerland, Chile, New Zealand); purpose of use (for fresh consumption, for baking); energy used in the production, storage and transportation (high, i.e. plane transported or stored apples; medium, i.e. boat transport; low i.e. national production); package system (4-piece packaging or loose); fair trade labelled (yes or no); brand (Bio Suisse, Prix Garantie, Nature and More, ENZA); traceability system (available or not).

The product attributes and varying attribute levels for the individual products were noted down on information cards which were presented in a matrix style, in addition to the products themselves (attributes on the front, product-related attribute levels on the back of the card). Each test participant was asked to explore those pieces of information (attribute levels) that they would need in order to make a clear purchase decision in favour of one of the products (one of the four apple varieties). Besides this, the participating consumers had to rank the sources of information according to their individual relevance, i.e. from the most important to the least important. Furthermore, only those sources of information assessed as relevant for the purchase decision had to be explored. This means that test participants had to stop exploring information at the point at which they considered themselves able to take the purchase decision. Interviewers noted which attributes were viewed and ranked the information explored from the most to the least important. Afterwards, the participating consumers chose their preferred product and had to explain why they made this choice.

An IDM allows the scale and structure of required information to be recorded in real situations which are close to the actual purchase. Additional information had been collected by means of a face-to-face questionnaire accompanied by a test. In particular, further insights were gleaned into actual buying behaviour with regard to fruit and organic products and attitudes on social and ecological quality criteria and data were collected with regard to the information sources on which consumers rely to inform themselves about fruit quality parameters.

1.2 Results

The results of the IDM indicate that consumers basically explore information about four to five product attributes on average when they make a purchase decision about apples. The five most relevant attributes detected were: type of flavour; origin; apple variety; cultivation system and price (see fig. 1). When consumers were asked *a posteriori* about their purchase decision and the importance of the attributes, some key quality indicators were identified. For some consumers, the type of flavour and the variety are key indicators for the purpose for which the product will be used, whereas its origin is a key indicator for fair trade issues. On the other hand, energy use and cultivation system (conventional, integrated, organic production) represent key indicators for price, fair trade issues and energy use (see arrows in fig. 1). This means that, even where consumers are interested in many qualitative, social and ecological issues along the supply chain, they often rely on fewer key quality indicators.

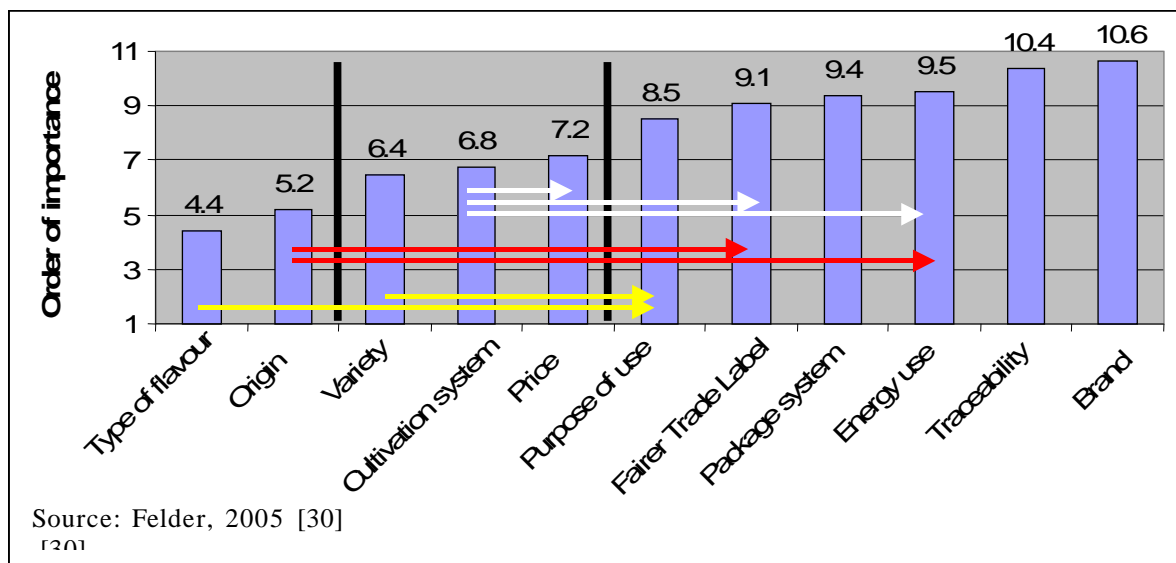
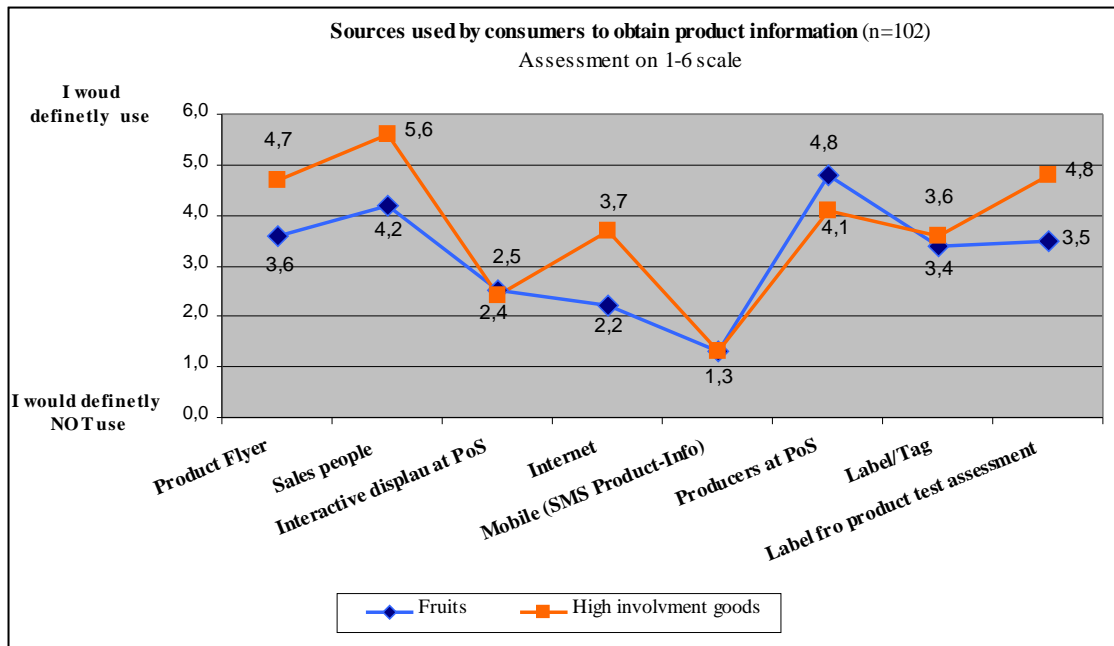


Figure 1. Results of the IDM – the importance of product attributes is ranked from the most to the least relevant in terms of the apple purchase decision (mean values). Key quality indicators are shown as arrows.

The accompanying test of preferred information sources, conducted in order to obtain greater transparency in the purchase decision making process, revealed that sources which are used for exploring quality related information differ clearly in the case of fruit purchase, as a low involvement product, from those used in the case of high involvement product purchases (such as a new TV, computer or bike). Whereas sales people, product flyers, independent product tests and the internet represent the main information sources when purchasing high involvement products, in the case of fruit purchase, the consumers surveyed stated relatively frequently that they preferred more straightforward sources of information, such as producers at the point of sale (at farm shops, markets or during promotional activities in supermarkets, see fig. 2). By contrast, none of the electronic media sources tested was revealed to be preferred/as frequently used as a source of information on quality issues in relation to fruit.



Source: Felder, 2005 [30]

Figure 2. Sources used by consumers to obtain product information. Comparison of fruit purchase with the purchase of high involvement products (such as a bicycle or TV).

6 Conclusion

The organic sector is considered to be both emerging and profitable, but few information or communication tools have been applied to enhance its quality.

It would therefore be helpful to develop information tools which make social and environmental quality information on the processes involved both available and easily accessible. There is a general lack of quality evaluation and communication systems in relation to many product-related quality indicators.

As stated in the literature, Felder's test, which applied an information display matrix to the case of apples [30], indicates that consumers of high-value goods rely on sales people to gain information to support their purchase decision. In this context, the second most important decision-making element is flyers and labels showing product assessments, and the third is producers as communicators at the PoS, on the internet and on labels. Furthermore, for fresh food items such as fruit, consumers rely even more heavily on sales staff.

In addition to this [30], it would be useful to explore the theory that the majority of consumers are satisfied with the present quality of the information on offer at the PoS – on which they rely – and that the internet does not yet feature prominently as an information source for food products. It was mainly consumers of organic food who stated that they had searched for information on the internet, concentrating in particular on recipes, fruit varieties and fair trade issues. On the other hand, many regular organic consumers take it for granted that social and ecological criteria are fulfilled by organic production requirements.

Even though the internet as a platform may provide users with the most complex and complete information, it should be noted that consumers are often satisfied with a minimum of information, such as a brief portrait of the producer [30].

In order to make organic food more attractive to the occasional organic consumer, communications policy must focus more strongly on quality-related issues. Appropriate communications should be based first and foremost on informing consumers about the

extra quality value inherent in organic food. Secondly, it should focus on the product's key quality attributes, and thirdly it should use producers as multipliers or well-informed sales people as a source of authentic quality communications. Media such as the internet or leaflets are rarely used for communications relating to low-involvement products such as food. In addition, whenever stories and images depicting the life and wellbeing of organic farmers and any issues associated with their production methods are used to raise the profile of the organic sector, most consumers will experience an emotional attraction to organic food.

Food products tend to be low involvement goods, which probably means that price is more important in the purchase decision. This can have two effects. Consumers would be more likely to choose one product rather than another because of lower price than would be the case with high involvement goods; but equally, they are more likely to use price as an indicator of quality which appears to be force leading in some circumstances to choosing the higher priced product.

One could argue that as food quality becomes more complex, it might lead food products to become higher involvement purchase decisions, thus the use of price as an indicator of quality will be strengthened for a generally low involvement product relative to choice on the basis of lower price.

By implementing more effective communication means of food quality to consumers, price shifts back to its basic role in economics, where consumers with perfect information always choose the lower priced version of comparable products, but are willing to pay more for additional quality attributes.

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